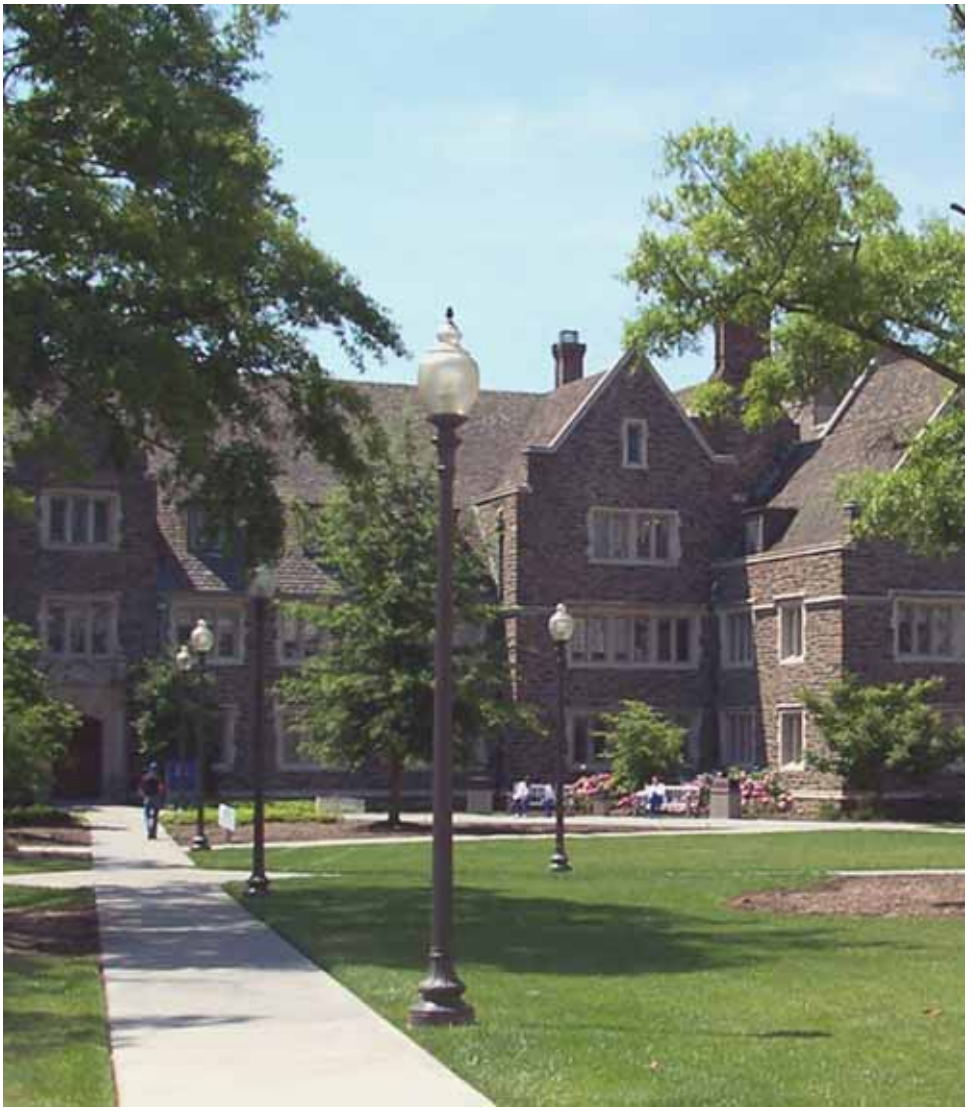
*bulletin of*

# Duke University 2006-2007

## *School of Medicine*



## The Mission of Duke University

James B. Duke's founding Indenture of Duke University directed the members of the University to "provide real leadership in the educational world" by choosing individuals of "outstanding character, ability and vision" to serve as its officers, trustees and faculty; by carefully selecting students of "character, determination and application;" and by pursuing those areas of teaching and scholarship that would "most help to develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to promote an intellectual environment built on a commitment to free and open inquiry; to help those who suffer, cure disease and promote health, through sophisticated medical research and thoughtful patient care; to provide wide ranging educational opportunities, on and beyond our campuses, for traditional students, active professionals and life-long learners using the power of information technologies; and to promote a deep appreciation for the range of human difference and potential, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the University; to contribute in diverse ways to the local community, the state, the nation and the world; and to attain and maintain a place of real leadership in all that we do.

Adopted by the Board of Trustees on February 23, 2001.

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The information in the bulletin applies to the academic year 2006-2007 and is accurate and current, to the best of our knowledge, as of June 2006. The university reserves the right to change programs of study, academic requirements, lecturers, teaching staffs, the announced university calendar, and other matters described in the bulletin without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national and ethnic origin, disability, sexual orientation or preference, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students. The university also does not tolerate harassment of any kind.

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Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 684-2823 or in writing to 615 Chapel Drive, Duke University, Durham, NC 27708.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

# Contents

# School of Medicine Academic Calendar 2006-2007[1]

# M.D. Program

## FIRST YEAR

## Fall Term 2006

| | |
|---|---|
| **July** | |
| 31–8/4 | Monday – Friday – Introductory Orientation to First Year |
| **August** | |
| | Monday, Begin classes, Molecules and Cells |
| **September** | |
| 15 | Friday, 5:00 p.m.–End classes, Molecules and Cells, section 61 |
| 20 | Wednesday, Begin classes, Normal Body, section 16 |
| 26-27 | Medical Student Research Day–AOA Day Sir Paul Nurse, Keynote Speech |
| | Friday, Deadline for Molecules and Cells grade submission to Registrar's Office |
| **November** | |
| | Monday – Friday, Registration for spring 2007 term |
| 21 | Tuesday, 6:00 p.m.–Begin Thanksgiving student holiday |
| | Monday, Classes resume–Normal Body, section 16 |
| **December** | |
| 15 | Friday, 12:00 p.m., ***classes end and Winter Break begins for 1st year Medical Students*** |

## 2007

| | |
|---|---|
| **January** | |
| 3 | Wednesday, Begin Neurobiology and Behavior, section 16* |
| 12 | Friday, Deadline for Normal Body grade submission to the Registrar's Office |
| 15 | Monday, Martin Luther King, Jr. student holiday |
| 26 | Friday, End Neurobiology and Behavior, section 16* |

## Spring Term 2007

| | |
|---|---|
| **January** | |
| 29 | Monday, Physical Examination week (Intensive Learning Period) |
| **February** | |
| 3 | Saturday, 5:00 p.m – End Physical Examination week (Intensive Learning Period) |
| TBA | Class of 2003 Promotions Committee Meeting–(date, time & location TBA) |
| 5 | Monday, Begin Body & Disease, section 16 |
| **March** | |
| TBA | Friday – Saturday, Medical Families Weekend |
| TBA | Friday, 8:00 p.m., Student/Faculty Show |
| | ***Spring break for 1st Year Medical Students begins*** |
| **April** | |
| | Monday, Resume Body & Disease, section 16 |
| TBA | Monday – Friday, 8:30 a.m –4:00 p.m.–Registration for 2nd year |
| **June** | |
| 29 | Friday, 5:00 p.m. – End classes, Body & Disease, section 16 |

## SECOND YEAR

## Fall Term 2006

| | |
|---|---|
| **July** | |
| TBA | Class of 2003 Promotions Committee Meeting; mid-July (date, time & location |
| TBA | 7/24-8/5 Monday–Saturday, classes begin at 8:00 a.m. – Intensive Learning Period (OCY) – 2 weeks |

1 Calendar Subject To Change.

| | |
|---|---|
| **August** | |
| 5 | Saturday, Classes end–Intensive Learning period (OCY) |
| 7 | Monday, Classes begin at 8:00 a.m.–1st Intersession, section 11–**Mandatory Attendance** |
| 11 | Friday, Classes end at 5:00 p.m.–1st Intersession, section 11 |
| 14 | Monday, 8:00 a.m.–Begin classes in sections 81, 61, 41 |
| **September** | |
| 4 | Monday, Labor Day student holiday |
| 8 | Friday, 6:00 p.m.–End classes in section 41 |
| 11 | Monday, Begin classes in section 42 |
| 22 | Friday, Friday, End classes in section 61 |
| 22 | Friday, Noon deadline for grade submission, section 41, to the Registrar's Office |
| 25 | Monday, Begin classes in section 21 |
| 26-27 | Medical Student Research Day–AOA Day Sir Paul Nurse, Keynote Speech |
| **October** | |
| 6 | Friday, 6:00 p.m. – End classes in sections 81, 21, 42 |
| 9 | Monday, Classes begin at 8:00 a.m.–2nd Intersession, section 12 – **Mandatory Attendance** |
| 13 | Friday, Classes end at 5:00 p.m.–2nd Intersession, section 12 |
| 16 | Monday – Begin classes in sections 82, 62, 43 |
| 20 | Friday, noon deadline for section 81, 42 grade submission to Registrar's Office |
| **November** | |
| 10 | Friday, 6:00 p.m.–End classes in section 43 |
| 13 | Monday, Begin classes in section 44 |
| 22 | Wednesday, 6:00 p.m., End classes in section 62 |
| 22 | Wednesday, 6:00 p.m.–*Begin Thanksgiving student holiday* |
| 27 | Monday, Classes Resume |
| 27 | Monday, Begin **Selective classes, section 22** |
| **December** | |
| 1 | Friday, noon deadline for section 43 grade submission to Registrar's Office |
| 8 | Saturday, 6:00 p.m.–End classes in sections 82, 22, 44 |
| 11 | Monday, Classes begin at 8:00 a.m.–3rd Intersession, section 13–**Mandatory Attendance** |
| 14 | Thursday, Classes end at noon–3rd Intersession, Section 13 |

*Winter Break for 2nd Year Medical Students begins. Classes resume Thur*sday, January 4th, 2007.

## Spring Term 2007

| | |
|---|---|
| **January** | |
| 1 | Monday, New Year's Day student holiday |
| 4 | Thursday, Noon, M2 Return for Intersession Preclerkship activities–**Mandatory Attendance** |
| 5 | Friday, Noon, deadline for grade submission fall 2006 grades, sections 82, 44 |
| 8 | Monday, Begin classes in sections 81, 61, 41 |
| 15 | Monday, Martin Luther King, Jr. student holiday |
| **February** | |
| 2 | Friday, 6:00 p.m –End classes in section 41 |
| 5 | Monday, Begin classes in section 42 |
| TBA | Registration for 2nd year Elective, summer term, section 41 |
| 16 | Friday, End classes in section 61 |
| 16 | Friday, noon deadline for section 41 grade submission to Registrar's Office |
| 19 | Monday, Begin Selective classes, section 21 |
| **March** | |
| 2 | Friday, 6:00 p.m.–End classes in sections 81, 42, 21 |
| 2 | Friday, noon deadline for section 61 grade submission to Registrar's Office |
| 5 | Monday, 8:00 a.m., 4th Intersession, section 12 –1 week Mandatory |
| 9 | Friday, Classes end 5:00 p.m., 4th Intersession, section 12 |
| 12 | Monday, Begin classes in sections 82, 62, 43 |
| 16 | Friday, noon deadline for sections 81, 42, 21 grade submission to Registrar's Office |

| | |
|---|---|
| **April** | |
| 6 | Friday, 6:00 p.m. End classes in section 43 |
| TBA | Monday-Friday–8:30 a.m. – 4:00 p.m.–Notification from Registrar's Office re: Registration for Rising MED3, fall 2006, spring 2007 |
| 9 | Monday, Begin classes in section 44 |
| 20 | Friday, End classes in section 62 |
| 20 | Friday, Noon, deadline, section 43, grade submission to the Registrar's Office |
| 23 | Monday, Begin Selective classes, section 22 |
| **May** | |
| 4 | Friday, 6:00 p.m.–End classes in sections 82, 22, 44 |
| 4 | Friday, 4:00 p.m.–Deadline for rising Third Year (MED3) enrollment forms to be submitted to the Registrar's Office |
| 5 | Saturday, Spring Break begins (all 2nd Year students) |

## Summer Term 2007

| | |
|---|---|
| **May** | |
| 13 | Sunday, Spring Break ends (all 2nd Year students) |
| 14 | Monday, Begin required Elective classes in section 41 (all 2nd Year students) |
| 11 | Friday, noon deadline for sections 82, 44, spring 2006 grade submission to Registrar's Office |
| **June** | |
| 8 | Friday, 6:00 p.m.–End required 4 week Elective, section 41 |
| 11 | Monday, Classes begin at 8:00 a.m.–5th Intersession, section 11–**1 week Mandatory** |
| 15 | Friday, Classes end 5:00 p.m. 5th Intersession, section 11 |
| 18 | Monday, 8:00 a.m., Begin classes in sections 82, 62, 43 |
| 22 | Friday, noon deadline for section 81 grade submission to Registrar's Office |
| 29 | Friday, noon, deadline for section 41 grade submission to Registrar's Office |
| **July** | |
| 4 | Wednesday, Independence Day holiday for 2nd year students |
| 13 | Friday, 6:00 p.m.–End classes in section 43 |
| 16 | Monday, 8:00 a.m. Begin classes in section 44 |
| 27 | Friday, End classes in section 62 |
| 27 | Friday, noon deadline, section 43 grade submission to Registrar's Office |
| 30 | Monday, Begin Selective, section 22 |
| **August** | |
| 10 | Friday, 6:00 p.m. End classes in section 82, 44, 22 |
| 10 | Friday, noon deadline, section 62 grade submission to Registrar's Office |
| 13-17 | Monday–Friday, Assessment Week–Required Evaluation/Examination |
| 24 | Friday, noon deadline, section 82, 22, 44 to Registrar's Office |

**Please note that Intersessions are a part of the required curriculum and attendance is mandatory.**

# THIRD YEAR

## Fall Term 2006

| | |
|---|---|
| **September** | |
| 4 | Monday, Labor Day holiday for 3rd year students |
| 5 | Tuesday, Begin classes, section 16 |
| 8 | Friday, noon, deadline for Med2, sections 82, 44 grade submission to the Registrar's Office |
| 15 | Research Ethics I module due date |
| 26-27 | Medical Student Research Day–AOA Day–Sir Paul Nurse, Keynote Speech |
| 30 | Research Ethics II module and proposal due date |
| **November** | |
| 13-17 | Monday – Friday, 8:30 a.m.–4:00 p.m.–Registration period for spring 2007, (MED4), all sections |
| 22 | Wednesday, 6:00 p.m.–Begin Thanksgiving student holiday |
| 27 | Monday–Resume Classes |

**December**

16 Saturday – 12:00 noon–End classes in section 16

16 Saturday – 12:00 noon–Winter Break begins for 3rd year medical students (through Jan. 2nd)

## Spring Term 2007

**January**

2 Tuesday, Begin classes, section 16

5 Friday, noon deadline for section 16, fall 2006 grade submission to Registrar's Office

15 Monday, Martin Luther King, Jr. student holiday

**April**

3-7 Monday, 8:30 a.m.–Friday, 4:00 p.m., Registration for Rising MED4, summer 2006, fall 2006

**June**

5-7 Tuesday, 8:30 a.m–Thursday, 4:00 p.m.–Drop/Add summer 2006, sections 82, 43, 44 (MED4)

22 Friday, 5:00 p.m.–End classes, section 16–(10 month students) –Thesis and Medical Statistics Modules Due Date
*Medical Statistics Modules due for all 3rd year students*

**July**

4 Wednesday, Independence Day holiday for 3rd year students

**August**

7-9 Tuesday, 8:30 a.m.–Thursday, 4:00 p.m.–Drop/Add fall 2006, all sections (MED4)

17 Friday, 5:00 p.m.–End classes, section 16 (12 month students–Thesis Due Date

*Mandated one-week vacation to be determined by student's individual mentors*

# FOURTH YEAR

## Summer Term 2006

**April**

3-7 Monday, 8:30 a.m.–Friday, 4:00 p.m., Registration for rising MED4, summer 2006, fall 2006

24 Monday, Begin classes in sections 81, 41

**May**

20 Saturday, 12:00 noon–End classes in section 41

22 Monday, Begin classes in section 42

**June**

2 Friday, deadline for sections 82, 42 grade submission to the Registrar's Office

6-8 Tuesday, 8:30 a.m.–Thursday, 4:00 p.m.–Drop/Add summer 2006, sections 82, 43, 44 (MED4)

17 Saturday, 12:00 noon, End classes in sections 81, 42

26 Monday, Begin classes in sections 82, 43

30 Friday, deadline for sections 82, 42 grade submission to the Registrar's Office

**July**

4 Tuesday, Independence Day holiday for 4th year students

22 Saturday, 12:00 noon, End classes in section 43

24 Monday, Begin classes in section 44

**August**

4 Friday, deadline for section 43 grade submission

8-10 Tuesday, 8:30 a.m.–Thursday, 4:00 p.m.–Drop/Add fall 2006, all sections (MED4)

19 Saturday, 12:00 noon, End classes in sections 82, 44

## Fall Term 2006

**August**

21 Monday, Begin classes, sections 81, 41

**September**

1 Friday, deadline for summer sections 82, 44 grade submission to the Registrar's Office

| | |
|---|---|
| 4 | Monday, Labor Day holiday for 4th year students |
| 16 | Saturday, 12:00 noon, End classes in section 41 |
| 18 | Monday, Begin classes in section 42 |
| 26-27 | Medical Student Research Day–AOA Day Sir Paul Nurse, Keynote Speech |
| 29 | Friday, deadline for section 41 grade submission to the Registrar's Office |
| **October** | |
| 3-5 | Tuesday, 8:30 a.m. – Thursday, 4:00 p.m.–Drop/Add, fall 2006, sections 82, 43, 44 (MED4) |
| 14 | Saturday, 12:00 noon, End classes in sections 81, 42 |
| 16 | Monday, Begin classes in sections 82, 43 |
| 27 | Friday, deadline for sections 81, 42 grade submission to the registrar's office |
| **November** | |
| 11 | Saturday, 12:00 p.m. End classes in section 43 |
| 13-17 | Monday, 8:30 a.m. – Friday, 4:00 p.m. – Registration, spring 2007, (MED4), all sections |
| 13 | Monday, Begin classes in section 44 |
| 22 | Wednesday, 6:00 p.m.–Begin Thanksgiving holiday for students |
| 27 | Monday, Classes Resume |
| **December** | |
| 1 | Friday, deadline, noon, grade submission for section 43 to the Registrar's Office |
| 5-7 | Tuesday, 8:30 a.m. – Thursday, 4:00 p.m. – Late Reg/Drop/Add for spring 2006 (MED4), all sections |
| 9 | Saturday, 12:00 noon, End classes, section 82, 44. Winter Break begins after noon |

## Spring Term 2007

| | |
|---|---|
| **January** | |
| 1 | Monday, New Year's Day holiday for students |
| 5 | Friday, noon, deadline, grade submission for sections 82, 44, fall term |
| 8 | Monday, Begin classes, sections 81, 41 |
| 15 | Monday, Martin Luther King, Jr. Holiday |
| **February** | |
| 3 | Saturday, 12:00 noon, End classes, section 41 |
| 5 | Monday, Begin classes, section 42 |
| 16 | Friday, noon, deadline for section 41 grade submission to the Registrar's Office |
| 20-22 | Tuesday, 8:30 a.m. – Thursday, 4:00 p.m. – Drop/Add period for spring 2007, sections 43, 44 (MED4) 43 is the required Capstone course |
| **March** | |
| 3 | Saturday, 12:00 noon, End classes, sections 81, 42 |
| **5** | **Monday, Begin Capstone course, section 43–**Mandatory Attendance |
| 16 | Friday, deadline for sections 81, 42 grade submission to Registrar's Office |
| 31 | Saturday, 12:00 noon, End classes, section 43 |
| **April** | |
| 2 | Monday, Begin classes, section 44 |
| 28 | Saturday, 12:00 noon, End classes, section 44 |
| TBA | Monday–Friday, Registration period for summer 2007, fall 2007 (Rising MED4) |
| TBA | Tues-Thurs, Drop/Add period for summer 2007, all sections (rising MED4) |
| **May** | |
| 4 | Friday, noon, deadline for sections 82, 44 grade submission to Registrar's Office |
| 10-13 | Thursday-Sunday – Graduation Activities |

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Wayne R. Thomann, Ph.H.., *Chair;* Drs. Brewer, Hunt, Jackson, Kaye, and Yoshizumi; Messrs. Borg, Caruso, Chang, Elks, Garber, Good, Guerry, Kelly, Knipper, Subasic, and Tencer; Mses. Burton, Hogan, J. James, T. James, Milbourne, Mullin, Palmer, Postal and Williams.

## Financial Aid

Stacey R. McCorison, M.B.A., *Chair;* Dr. Armstrong; Dr. Broda, Mses. Patricia Dieter, Gail Haigler, Jan Richardson, Karen Woodlief

## Hospital Ethics

James L. Travis, Ph.D., *Chair*; Dr. Alexander and Ms. Burke, *Co-chairs*; Drs. Fortney, Goldstein, Larrier, Lylerly, Rosoff, Scharf, and Shanawani; Mses. Alexander, Feidelson, Hudson, Maher, Reyes.

## Hospital Infection Control

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## Hospital Transfusion Committee

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## Institutional Animal Care and Use Committee

E. Lee Tyrey, Ph.D., *Chair;* James Reynolds, Ph.D. and Warren Meck, Ph.D., *Vice-chairs;* Drs. Amalfitano, Anderson, Buhusi, Cant, Collins, Crowder, Ehlers, Gerard, Glower, Hale, Hawkins, Hedlund, Kirby-Smith, Klopfer, Koch, Krangel, Lewis, Linney, Lyerly, McClay, McClellan-Green, Mills, Norton, Orchard, Peng, Pickup, Read, Rezvani, Rickman, Saling, Schanberg, Schomberg, Sharp, Sullivan, Sun, Trasti, Vaslef, Vigna, Williams, and Zhuang; Mses. deGuehery, Dillon, Keys, Lasley, and Lundberg.

## Institutional Biosafety Committee

Andy Amalfitano, DO, PhD, and Wayne R. Thomann, Dr.PH., *Co-chairs*; Drs. Fred Fuller, EliGilboa, Debra Hunt, Tom Kost, David Pickup, and Ken Alexander;. Mr. Scott Alderman (ex officio). Contact person: Susan Zagiba, Secretary.~~,~~ *ex-officio*.

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## Institutional Review Board for Clinical Investigations

Agarwal, Sheela MA, MS, BS; Allen LaPointe, Nancy PharmD; Alvarez-Secord, Angeles M.; Amalfitano, Andrea DO, PhD; Anderson, Robert MD; Bailey, Annette Anderson MSW; Baines, Tyrone R. PhD; Bajwa, Wajeeh PhD; Beatty, Alexis BSE; Bennett-Guerrero, Elliott MD; Bentley, Rex MD; Block, Jeremy B; Blood-Siegfried, Jane PhD; Brosnan, Thomas MD; Burk, Carol MD; Campbell, Elaine MA; Charles, H. Cecil PhD; Chireau, Monique MD, MPh; Cole, Eric L. MD; Coleman, James JD; Coley, Charlotte MACT, CIP; Collins, Shirley BA; Cornett, Wendy R. M.D.; Cotten, C. Michael MD; deBruijn, Norbert MD, 'DeCamp; Matthew MS, Yr 4; Dement, John PhD; DiBernardo, Louis MD; Docherty, Sharron RN, PhD; Donahue, Mark P. MD; Doria, Gail MPA, RN; Drucker, Robert MD; Easton, Penelope PhD; Eck, Sharon A. DNSc., MA, RN; Edwards, Pamela B. D.Ed., RN, Edwards, Pamela B. D.Ed., RN; Ellison, Sharon PharmD; Evans, David BS; Falletta, John MD; Farmer, Joseph MD; Fisher, Deborah A. MD, MHS; Franklin, Jennie Johnson MA; Freedman, Sharon MD; Gan, T.J. MD; Gattis Stough, Wendy; George, Robert M. J.D.; Giordano, Louis RhD; Gustafson, Mark D. ,J.D.; Gwyer, Jan PhD, PT; Habib, Ashraf MD; Hahn, Carol A. MD; Harrelson, John MD; Harwood, Kerry V. MSN, RN; Henkel, Peter W. Pharm.D.; Hicks, Charles MD; Hicks, Lorna; Hill, Elizabeth DNSc, RN; Holloway, Hilda RN, BSN; Howles, Gabriel; Hulette, Christine MD; Hurwitz, Jean BSPharm; Jackson, George MD; James, Andra MD; James, Andra MD; Johnson, Christina BS, D. Pharm.; Kelley, Scott MD; Kessler, John PharmD; Klein, Stephen MD; Koeberl, Dwight MD; Kopetz, E. Scott MD; Lassiter, Timothy PharmD; Lee, Kerry PhD; Legge, John MSW, Lewis, Margaret MLS, Liebelt, Ralph MD, Lipscomb, Lafayette PhD,MLSc, Livingston, Elizabeth MD; Lyerly, Anne Drapkin MD; Maafo, E. Victor M.Div, MSc, MA; MacFall, James R. PhD; Mahaffey, Kenneth MD; Malhotra, Anuj BS; Maney, Monte MS; Martin, Gavin MD; McClure, Mike PhD; McConkie-Rosell, Allyn PhD; Middleton, John MD; Minchew, Joe MD; Minda, Sharon MSN; Minnick, C.P. BD, THM, DD; Montana, Gustavo MD; Morrissey, Joseph M.S., R.Ph.; Morse, Michael MD; Moylan, Joseph MD; Muhlbaier, Lawrence PhD; Muir, Holly MD; Murray, John PharmD; Myers, Evan MD; Nordlund, Cynthia RN, MSN; Olsen, Annette M.Div; Ostbye, Truls MD, MPH, PhD, MBA; Pangborn, Elise RD, LDN, CDE; Parkerson, George MD; Payne, Judith Ph.D., RN; Pietrobon, Ricardo MD, PhD; Pollock, Laurie MD; Posther, Katherine MD; Power, Jody MS, MBA; Prasad, Vinod MD; Prewitt, Judy RN, MSN; Price, Marva L. M. Dr.P.H.; Prosnitz, Leonard M.D.; Quinlan-Colwell, Ann N. MSN, RN; Rabinovich, Egla M.D., M.P.H.; Reams, Diane PharmD; Rizzieri, David A. MD; Robboy, Stanley M.D.; Roberts, Joseph L. MD, PhD; Robertson, Kerri MD; Rudd, Christine Pharm.D.; Scanga, Maria JD; Schildkraut, Joellen PhD; Schmidt, Evelyn D. MD; Shanawani, Hasan MD, MPH; Shaw, Heather MD; Sidhu-Malik, Navjeet MD; Sigman-Hendricks, Kate JD; Singletary, Vance MD; Smith, Joel PhD; Speer, Marcy PhD; Stewart, Beth RN; Stinnett, Sandra DrPH, MS; Suarez, Edward C. Ph.D.; Sullivan, Robert MD, MPH; Talbert, Steven PhD; Taylor, Warren MD; Toffaletti, Dena PhD; Tornai, Martin Ph.D.; Turner, Barbara RN, PhD; Turner, George MA, RPh; Wackerhagen, Timothy C. MSW; Weidner, Alison C. M.D.; West, Yvette B. RN, MSN; Westby, Greg RPh; Westman, Eric MD, MHS; Whelen Schaffer, Susan DO; Williams, Larry MD; Wolfe, Walter MD; Wright, Jr., Hugh K. (Jim) MDiv.., MSW; Zaas, Aimee MD; Zimmerman, Sherri MD.

## Library

Patricia L. Thibodeau, M.L.S., M.B.A., *Chair;* Drs. Erickson, Gwyer, McCusker, Rajagopalan, and Turner; Mses. Kahn and Ryan; Ms. Avent, MSN, MBA, MHA; Mr. Jones, MHA, MBA; Mr. Peterson, M.S.L.S., *ex officio;* Ms. Murphy, M.L.S., *ex officio.*

## Medical Center Awards

Drs. Anderson, Bollinger, Casey, Cullen, Dawson, Epstein, Greenberg, Hertzberg, Parkerson, Perfect, Pisetsky, Pizzo, Schwab, Williams, and Whorton. R. Sanders Williams, M.D., *Chair;* Drs. A. Brown, H. Brown, Califf, Casey, Champagne, Cohen, Corless, Epstein, Frank, Fulkerson, Goldschmidt, Halperin, Haynes, Heitman, Hogan, Jacobs, Kay, Krishnan, Lyerly, Mark, McCarthy, McKinney, McNamara, Means, Michener, Nevins, Newgard, Newman, Pericak-Vance, Pizzo, Raetz, Ravin, Simon, Snyderman, Sugarman, Tedder, Telen, Wigfall, Wilkinson, Willard, and Wright; Messrs. Gibson, Rum, and G. Williams; Mses. Saito and Tenney.

## Medical Radiation Control and Radioactive Drug Research Committee

Christopher T. Coughlin, M.D., *Chair;* Drs. Harris, Lobaugh, Ludwig, Reiman, Samulski, Sketch, Wong, and Yoshizumi; Mr. Petry; Ms. Fuchs and Tenney.

## Membership for Medical Radiation Control Committee

Len Spicer,, Ph.D., *Chair*, Drs. Sketch, Lobaugh, Yin, Reiman, Wong and Yoshizumi; Mses, Tenney, Fuchs; Messrs. Petry, and Ludwig.

## Merit Awards

Edward C. Halperin, M.D., *Chair;* Dr. Armstrong; Ms. McCorison.

## Minority Affairs Committee for Undergraduate Medical Education

Delbert Wigfall, *Co-Chair;* Maureen Cullins, *Co-Chair;* Drs. Svetkey, and Winn; Ms. Coward, Student Representatives from SNMA and the Davison Council; Drs. Armstrong and Williams, *ex officio.*

## Misconduct in Research

Drs. R. Randal Bollinger, M.D., Ph.D., Dawson, Leithe, Olsen, and Pisetsky.

## North Carolina Residence

Marcie Ellis, *Chair;* Mr. Wallace; Ms. McCorison.

## Pharmacy and Therapeutics

Peter S. Kussin, M.D., *Chair;* Drs. Califf, Clem, Colon-Emeric, Doraiswamy, Ginsberg, Moylan, Perfect, and Rudd; Messrs. Borg and Dedrick; Mses. Crouch and Price; Mr. Dozier; Ms. Walbrun, *ex officio.*

## Promotions Committee, Entering Class of 2002

Charles Steenbergen, M.D., Ph.D., *Chair;* Drs. Allingham, Copeland, Gerardo, Jakoi, and Mitchell; Mses. McCorison and Senter.

## Promotions Committee, Entering Class of 2003

Daniel Schmitt, Ph.D.., *Chair;* Drs. Kaprielian, Krystal, Raetz, Speer, Tuttle-Newhall, and Waugh; Mses. McCorison and Senter.

## Promotions Committee, Entering Class of 2004

Kathryn Andolsek, *M.D.,M.P.H., Chair;* Drs. Dawson, Guilak, King, Muir, Sheline and Stein; Mses. McCorison and Senter.

## Promotions Committee, Entering Class of 2005

Steven J. Bredehoeft, M.D., *Chair;* Drs. Bowes Rickman, Chilukuri, Lo, Major, McIntosh, Nadler, and Prose; Mses. McCorison and Senter.

## Radioactive Drug Committee:

Len Spicer, Ph.D., *Chair*, Drs. Wong and Yoshizumi, Messrs. Petry and Reiman.

## Scholarship Committee

William D. Bradford, M.D., *Chair;* Drs. Dawson, and Weinberg; Mses. McCorison and Tuck.

## Second Year Course Directors Committee

Robert A. Waugh, M.D., *Chair;* Drs. Bredehoeft, Chilukuri, Copeland, Drucker, Haynes, Nahum, Petrusa, Sebastian, Sheline, Stein, Tuttle-Newhall, and Wigfall; Mses. McCorison and Reilly.

## Senior Scholarships

Lori A. Bastian, M.D., *Chair*; Drs. Brown, Drucker, Haynes, Krystal, Pendergast, and Wigfall; Mses. Ellis and McCorison.

## Study Away From Duke

Caroline Haynes, M.D., Ph.D., *Chair;* Drs. Drucker, Goodman, and Wigfall; Ms. McCorison. (Prospective visiting medical students must contact Steven Wilson- 684-8042)

## Third Year Committee

Daniel Laskowitz, M.D., *Chair;* Drs. Andolsek, Blobe, Bowes Rickman, Buckley, Dawson, English, Freedman, Gromeier, Hauser, Humphreys, King, Klitzman, Krystal, Lo, Matchar, Mitchell, Moon, O'Connor, Scott and Wagner. Official liaisons: Drs. Drucker, Grochowski, and Schulman; Mses. Berke, Ellis, McCorison, Piva and Shuping; Mr. Schneider; Student Representatives: Mr. Talbot

## Undergraduate Medical Education - Curriculum

Edward Buckley, M.D. *Chair*; Drs. Baker, Bollinger, Cartmill, Dawson, English, Gaudet, Govert, Grochowski, Haynes, Heflin, Hershfield, Kaprielian, King, Major, Mark, Marks, Michener, Nadler, Neelon, Petrusa, Promes, Raetz, Schwinn, Sheline, Stolp, Swartz, and Taekman; Messrs. Boas, Floyd, Goswami, Karra, Langheier, Lee, MixcoMohanty and Nosnik. Mses. Butler, DeSimone, Donnelly Haefelle, Schroeder, Dzau, McCorison, Reilly and Thibodeau.

## Veterans Administration Research and Development

Gregory McCarthy, Ph.D., *Chair;* Drs. Bastian, Dunn, Edelman, Hoffman, Morey, Shelburne, Weinberg, Welty-Wolf, and Zinn; Mses. Brese, Brinkley, and Thorne; Messrs. Freeman and Phaup, *ex officio.*

## Veteran's Administration, Dean's

R. Sanders Williams, M.D., *Chair;* Drs. Allison, Begbie, Bronsan, Brown, Cohen, Corless, Epstein, Halperin, Hoenig, Howell, Keitz, Krishnan, Jacobs, Mark, McKeown, McKinney, Michener, Newman, Oddone, Pappas, Pizzo, Ravin, Shelburne, Simel, Vandemark, Weinberg, Weiner, Willett, Wright, Yarger, and Yevich; Messrs. Fache, Phaup and G. Williams; Mses. Haigh, Huggins, Loe and Sanserverino.

# *History*

# History

I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines is, next to religion, the greatest civilizing influence. I have selected hospitals as another of the principal objects of this trust because I recognize that they have become indispensable institutions, not only by way of ministering to the comfort of the sick, but in increasing the efficiency of mankind and prolonging human life.

James Buchanan Duke, Indenture of the Duke Endowment, 1924

In 1924, James Buchanan Duke, an industrialist and philanthropist, established the Duke Endowment and directed that part of his gift be used to transform Trinity College in Durham, N.C. into Duke University. The following year, upon his death, Mr. Duke made an additional bequest to the Endowment and the university, including funds to establish a medical school, hospital, and nursing home.

One of Mr. Duke's primary motivations in establishing the Endowment and the School of Medicine was the improvement of health care in the Carolinas. At a time when medicine in the region was still a cottage industry, Duke dared to dream of creating what he hoped would become one of the leading medical institutions in the nation.

By the time the new school and hospital opened in 1930, this dream was already well on its way to becoming reality. Recognizing its responsibility for providing quality care to the people of the Carolinas, Duke soon opened the first major outpatient clinics in the region. The Private Diagnostic Clinic, opened in 1931, not only provided coordinated medical and surgical care to private patients with moderate incomes but also allowed members of the medical faculty to contribute a portion of their earnings toward the continued excellence of medicine at Duke. Less than five years after the School of Medicine opened, the Association of American Medical Colleges ranked it among the top 25 percent of medical schools in the country.

Building on this heritage, Duke University Medical Center has grown and expanded over the years and now ranks as one of the world's outstanding health care centers. In education, its innovative medical curriculum features a generous measure of elective courses in the belief that all health professionals must be prepared for a lifetime of self-education. The scientific grounding for that education is provided through participation in a wide variety of ongoing research programs. Duke University Hospital, now located in facilities opened in 1980 and since expanded several times, draws patients from across the Carolinas, the United States, and the world for diagnosis and treatment. In both basic and clinical research, Duke University Medical Center has grown into a premier biomedical research institution and is consistently one of the largest recipients of funding from the National Institutes of Health.

In recent years, Duke University Medical Center has evolved into an even broader health care institution, one poised to meet the challenges of health care delivery in the twenty-first century. No

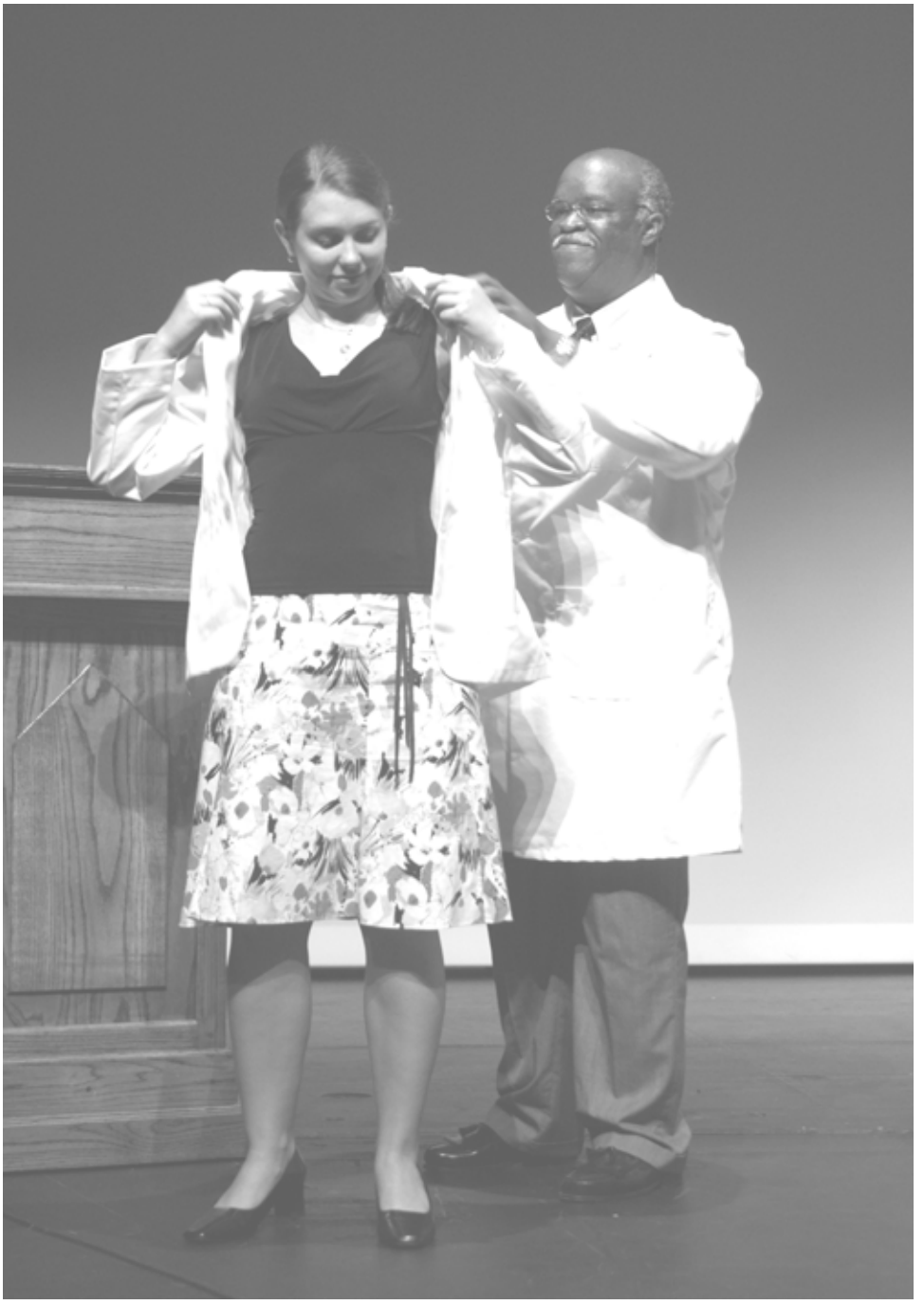
longer solely a traditional academic medical center where patients are referred almost exclusively for specialty care, Duke has expanded to include an integrated system of health care providers and facilities across the region. The Duke University Health System is composed of Duke University Hospital; Durham Regional Hospital; Duke Health Raleigh Hospital; Duke Health Community Care; and Duke University Affiliated Physicians; and encompasses many other strategic relationships and programs.

Representing the continuing fulfillment of the dream of James Buchanan Duke, Duke University Medical Center still seeks to carry out its teaching, research, and patient care programs in a manner that meets the needs of society. In keeping with its heritage, it seeks to provide socially relevant medical education, research, and patient care and is expressly committed to the search for solutions to regional, national, and global health care problems.

# The University

Duke University, located in Durham, North Carolina, has an enrollment of almost 12,000 students from all 50 states and from many foreign countries. The university's schools and colleges include Trinity College of Arts and Sciences, the Graduate School, and the Schools of Business, Divinity, Engineering, Environment and Earth Sciences, Law, Medicine, and Nursing. Durham, with a population of 223,000, is in the Piedmont region of North Carolina and has easy access to the sea coast and mountains. It is one of the three cities bounding the Research Triangle Park where numerous private research laboratories and governmental agencies are located. Duke University is 25 miles from North Carolina State University in Raleigh, eight miles from the University of North Carolina at Chapel Hill, and is in the same city as North Carolina Central University.

# *Doctor of Medicine Program*



# Doctor of Medicine Program

## Mission Statement and the Medical Curriculum

The mission of the Duke University School of Medicine is:

To prepare students for excellence by first assuring the demonstration of defined core competencies.

To complement the core curriculum with educational opportunities and advice regarding career planning which facilitates students to diversify their careers, from the physician-scientist to the primary care physician.

To develop leaders for the twenty-first century in the research, education, and clinical practice of medicine.

To develop and support educational programs and select and size a student body such that every student participates in a quality and relevant educational experience.

Physicians are facing profound changes in the need for understanding health, disease, and the delivery of medical care—changes which shape the vision of the medical school. These changes include: a broader scientific base for medical practice; a national crisis in the cost of health care; an increased number of career options for physicians, yet the need for more generalists; an emphasis on career-long learning in investigative and clinical medicine; the necessity that physicians work cooperatively and effectively as leaders among other health care professionals; and the emergence of ethical issues not heretofore encountered by physicians. Medical educators must prepare physicians to respond to these changes. The most successful medical schools will position their students to take the lead addressing national health needs. Duke University School of Medicine is prepared to meet this challenge by educating outstanding practitioners, physician scientists, and leaders.

Continuing at the forefront of medical education requires more than educating Duke students in basic science, clinical research, and clinical programs for meeting the health care needs of society. Medical education also requires addressing such concerns as national science and health policy, meeting the health care needs of society, providing medical care for the disadvantaged, and applying basic science discoveries to clinical medicine. As health care practices at the federal, state, institutional, and individual levels evolve, these endeavors need input from physicians uniquely prepared to assume guiding roles.

Duke University's role as a leader in medical education is built upon its internationally-recognized tradition of fostering scientific scholarship and providing excellent preparation for the practice of medicine. The curriculum promotes creativity, scholarship, leadership, and diversity. It integrates the basic and clinical sciences and prepares students to pursue the spectrum of options available to modern physicians, from basic science to primary care. Duke University Medical School produces at least three prototype physicians; the physician scientist, the clinician-investigator, and the practitioner (either generalist or specialist).

The Duke faculty enhance the Medical School's curriculum by continually embracing new methods of education and evaluation to improve the medical education experience. Attention to curricular development assures Duke graduates that they are grounded in basic biomedical sciences, competent and caring clinicians, prepared to pursue a lifetime of continuing education, and capable of participating in local, national, and international discussions about the delivery of health care now and in the future.

Features of the four-year curriculum include:

- Development of a core medical curriculum that is rigorous, efficient, integrative, and forms a realistic base of knowledge for a physician;
- Integration of basic, clinical, psychosocial, and population information and skills throughout the four years of medical education;
- General introduction to basic and clinical science for one year each, followed by two years of individualized curricular options that promote professional diversity and personal development;
- An elective third year which permits students to pursue their independent scholarly interest across a range of scientific disciplines from basic biomedical science to health policy;
- Promotion of structured active learning that includes explicit experience in leadership and cooperative roles;
- Mentorship of students by faculty in all facets of the learning process;
- Implementation of a standardized and valid assessment of progress, carefully and thoughtfully evaluating the acquisition of knowledge, skills, and attitudes appropriate to the future goals of each student;
- Incorporation of information technology and the use of computers into student learning and evaluation;
- Research and implementation of new and improved methods of teaching.

The curriculum, while offering a previously unattainable degree of flexibility to medical education and new opportunities for intellectual exploration, also makes heavy demands upon the student. It should be recognized that medical students at the Duke University School of Medicine are expected to maintain a consistent level of performance and to demonstrate qualities of initiative and dedication to their chosen profession. A scholarly attitude toward medicine that continues throughout an entire career is an important objective of the medical school. The foundations of this attitude to learning should accompany the student upon entering.

Students are expected to maintain a professional attitude toward patients at all times, to respect confidences, and to recognize that they are the recipients of privileged information only to be discussed within the context of scholarship and in circumstances that truly contribute to the educational process or to the care of the patient. This attitude involves consideration not only of speech and personal appearance but also of morality, honor, and integrity.

Beginning in the fall of 1987, the School of Medicine greatly enlarged the focus on ethics and human values in the curriculum. In the face of major advances in medical technology and sciences, today's medical student must be prepared to deal with new complexities of medical practice. These advances and complexities also make it of paramount importance that medical education enable each student to grow in both depth and breadth as a human being. The Duke University School of Medicine is rising to this challenge.

# Doctor of Medicine Degree

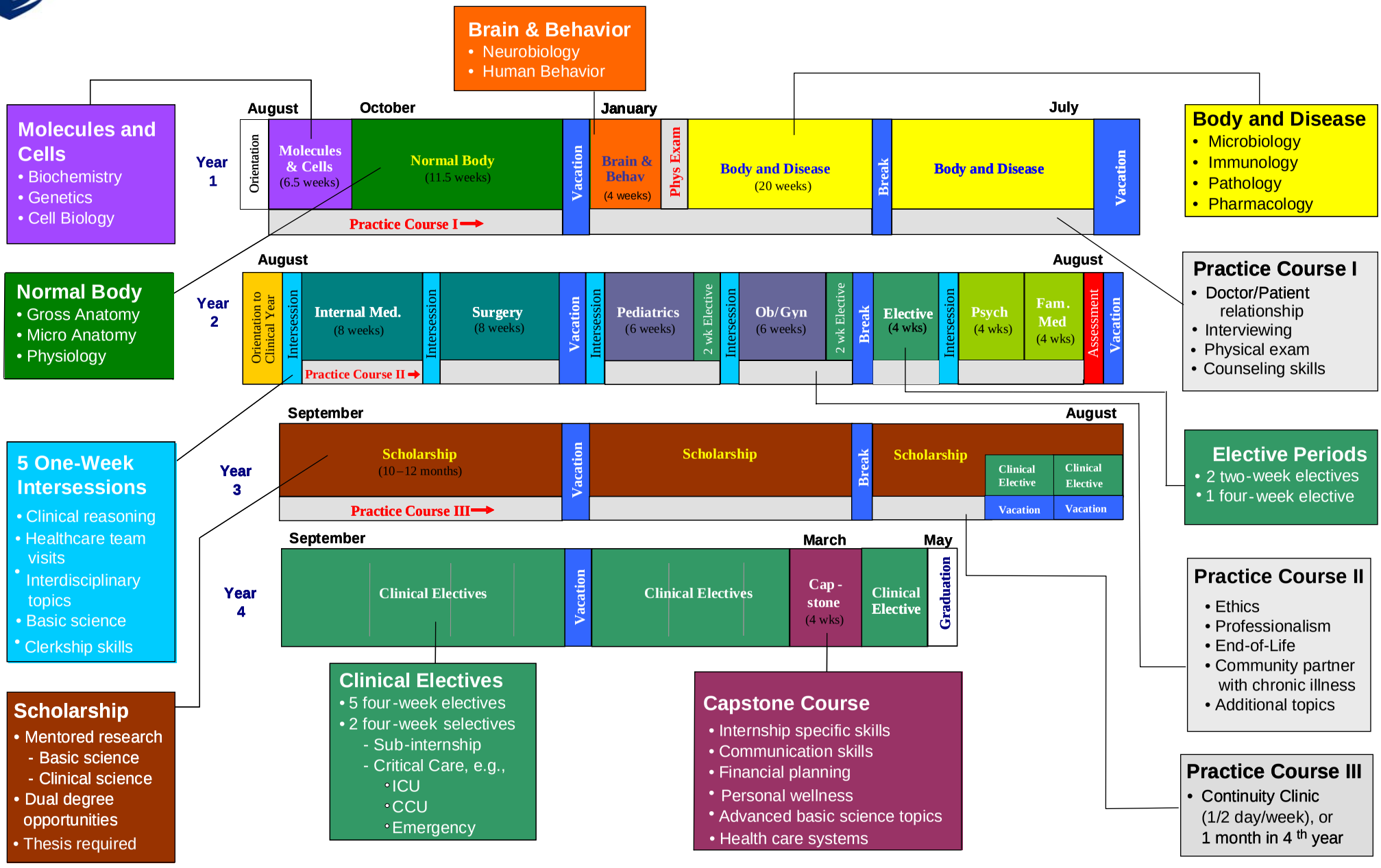
The degree of Doctor of Medicine is awarded, upon approval by the faculty of Duke University, to those students who have satisfactorily completed the academic curriculum; demonstrated the intellectual, personal, professional, and technical competencies to function as skilled physicians; and demonstrated their fitness to practice medicine by adherence to a high standard of ethical and moral behavior.

The faculty of Duke University School of Medicine have developed general guidelines for technical standards for medical school admissions and degree completion. These are available on request from the Office of Admissions.

The awarding of degrees is contingent upon payment of, or satisfactory arrangements to pay, all indebtedness to the university.

In February, 2002, the Duke University School of Medicine was fully accredited for seven years by the Liaison Committee on Medical Education of the Association of American Medical Colleges.

# THE DUKE CURRICULUM: FOUNDATION FOR EXCELLENCE



**Curriculum Revision.** In January, 2002, the School of Medicine began a curriculum revision project. While every effort has been made to include decisions on changes to date, we reserve the right to make further changes. As such, the curriculum described below is subject to change.

**Course Requirements—First Year.** The student studies the principles of all the basic science disciplines. Rather than mastering an encyclopedic array of facts, the purpose is to acquire familiarity with the major principles of each subject. In addition, during the first three years students are required to participate in the Practice course which is designed to expand primary and continuity care experience for Duke medical students. The course is a combined clinical curricular experience which emphasizes progressive knowledge and competencies.

The first year consists of instruction in the following:

**Semester 1**

INTERDIS 105B -Practice

INTERDIS 100B -Molecules and Cells

INTERDIS 101B - Normal Body

**Semester 2**

Intro to Physical Examination -----(Intensive Learning Period)

INTERDIS 103B -Neurobiology and Behavior

INTERDIS 102B - Body & Disease

INTERDIS 105B - Practice

Year 1 consists of three integrated basis science courses and the Practice course:

- **Molecules and Cells** (integration of Biochemistry, Genetics, and Cell Biology) – 6.5 weeks
- **Normal Body** (integration of Gross Anatomy, Microanatomy, Physiology, Neurobiology, and Human Behavior) – 15.5 weeks
- **Body and Disease** (integration of Microbiology, Immunology, Pathology, and Pharmacology) – 20 weeks
- **Practice –** Doctor/patient relationships, interviewing, physical exam, basic counseling skills (4 hours/week for entire year)

**Guiding Principles for Year 1:**

- Integrate material within and between courses
- Include time for independent learning (generally one-half day of unstructured time per week)
- Incorporate more small group and active learning opportunities

As a result of the changes in the curriculum, individual courses in the basic sciences will not be offered and no other enrollments honored.

A vacation takes place after the conclusion of the first year. In addition, every class has Thanksgiving and the day after, Christmas, New Year's Day, Martin Luther King, Jr. holiday, and spring break with the exact dates depending upon rotation and class schedules. Approved calendars are included in this Bulletin as well as published on the *http://registrar.mc.duke.edu* website.

**Course Requirements—Second Year.** Satisfactory completion of the first year curriculum is a prerequisite to the second year curriculum. The second year provides an exposure to clinical science disciplines. This permits students early in their careers to become participants in the care of patients. The acquired appreciation of the problems of the clinical areas and the opportunities to recognize the applications of the basic sciences leads to a more meaningful selection of courses for the subsequent two years.

The second year consists of an Orientation to the Clinical Year (OCY), six core clerkship rotations, five Intersessions, three elective periods, (two 2 weeks in duration and one four weeks) the Practice course, and a final week for assessment.

The goals of the core clerkships include developing students' skills in accurate patient-based problem-solving and appropriate use of resources to diagnose and treat patients. The **core clerkship** rotations include:

- Medicine (8 weeks)
- Surgery (8 weeks)
- Obstetrics and Gynecology (6 weeks)
- Pediatrics (6 weeks)
- Family Medicine (4 weeks)
- Psychiatry (4 weeks)
- Practice (4 hours every other week for entire year) – Advanced clinical themes (ethics, professionalism, end-of-life, etc.)

Five one-week **Intersessions** occur between clerkship rotations. Each week has an interdisciplinary theme, (Patient Safety, Aging, Oncology, Critical Care, and Disaster Preparedness). The goals of the Intersessions are to:

- Learn and practice clinical reasoning skills
- Understand the role of other healthcare providers and their interaction with physicians
- Apply advanced basic science principles to clinical medicine
- Debrief Community Partners visit with chronically ill patients
- Perform clerkship specific skills and techniques prior to the beginning of the rotation
- Discuss other interdisciplinary topics and their relevance to clinical practice (e.g., ethics, cultural competence, alternative medicine)

Elective periods include one four-week Elective and two two-week Selectives. Selectives provide an opportunity before the fourth year for students to learn about clinical subspecialties that are not covered by clerkships and offer career exploration.

In addition, after completing second-year clerkships, all students must take the Clinical Performance Examination (CPX). The CPX is a standardized test of clinical performance that was developed by faculty from all four medical schools in North Carolina and is now administered at all schools. Duke students will take the CPX during the Assessment week. The purpose of the CPX is to evaluate the effectiveness of the clinical curriculum and each student's ability to respond to patient problems and concerns. Skills relating to communicating with patients, history taking, physical examination, assessment, and follow-up plans are evaluated for 8 different patients.

**Course Requirements—Third and Fourth Years.** Satisfactory completion of the second year curriculum is a prerequisite to the elective curriculum. Third year is 10 months with an optional two months. The fourth (elective) year of undergraduate medical education builds upon the experiences in basic science and clinical medicine gained in the earlier years. Fourth year is two 16 week terms with an optional two month summer term. Successful completion of 68 elective credits (36 basic science credits during the third year and 32 clinical science credits during the fourth) is required for graduation. Course offerings are described in the different departmental sections in this Bulletin. The wide selection affords an opportunity for the student, with guidance from advisers, to design a program that best satisfies her or his needs.

*Third Year*. The purpose of the scholarly research experience, usually occurring in the third year, is to provide the student with an opportunity to focus in an area or areas of interest and to pursue, in depth, a scholarly activity. Time may also be spent gaining strength in areas of basic science weakness.

Two different avenues to satisfying third year requirements are available. The first, which is most commonly followed, requires the student to select a home base study program for the basic science elective experience. With the aid of advisers, the individual elective program is devised to include an area of scholarly work to pursue which may or may not be an independent research project. A combination of a research preceptorship, tutorials, and a thesis will comprise the overall basic science elective experience. The second path open to students is participation in a combined M.D./master's degree program in clinical research, public health, business administration, public policy, law, library science, information science and clinical psychology. With rare exception, the

elective experience should be taken as a block. During the third year, students are required to complete 36 basic science credits including three clinical science credits for the required Practice Year 3. The students must also complete a quantitative thesis for three credits. Specific requirements related to the thesis and third year components can be found on the third year Blackboard site. Third Year students are also required to complete Research Ethics Modules I and II.

*Fourth Year*. The clinical elective experience, usually occurring in the fourth year, should be used to: (a) aid in decision-making about the area of choice of postgraduate training, (b) obtain experiences in areas that would not be included in that postgraduate training and, above all, (c) pursue active experiences in patient care sufficient to provide the basic skills necessary for doctor-patient interaction.

Students must complete clinical electives including several **required rotations** designed to enhance students' preparation for their internships and residencies:

- Subinternship
- Critical care/Anesthesiology/Emergency Medicine rotation
- Continuity clinic (if not completed in the third year)

Additionally, students participate in a four-week required **Capstone** course in March that includes Match Day. The Capstone course provides an opportunity to bring the whole class together to cover topics such as:

- Clinical skills for internship
- Ethical issues
- Professionalism
- Doctor/patient communication
- Medical/legal issues
- Health systems
- Patient Safety
- Self-care
- Advanced basic science principles

## Fourth Year Course Requirements

Fourth year students please remember that if you did not satisfy your Practice requirement for Year 3, you must have a total of 36 required credits from the approved list of Practice electives. The credits earned (by exempted students) for these courses will fulfill INTERDIS 305C and the (32) Year 4 credit requirements at the same time. Eligible courses are:

| | |
|---|---|
| MEDICINE 413C | Tutorial in Medical PDC |
| MEDICINE 414C | Introduction to Outpatient Primary Care Internal Medicine |
| MEDICINE 449C | Geriatric Medicine |
| COMMFAM 439C | Advanced Clerkship in Family Medicine (outpatient) |
| COMMFAM441C | Family Medicine Continuity Experience (outpatient) |
| COMMFAM 449C | Advanced Preceptorship in Community and Family Medicine |
| PEDS 410C | Advanced Pediatrics (outpatient) (**must have the Practice office permission)** |
| PSYCHTRY 443C | Clinical Aspects of Alcohol and Drug Abuse |

Also, all fourth year students are required to have completed clinical electives that fulfill the following criteria by the time of graduation:

-a four-week, 5-credit subinternship experience in the field of their choice, which must be completed at Duke

-a four-week, 4 or 5 credit critical care elective, which may be done at Duke or as a study away at another institution. At Duke, enrollment in the following courses would meet this requirement. If the student has had a placement in an Intensive Care Unit to meet their subinternship requirement, they should select one of the other course options to meet the critical care requirement:

| | | |
|---|---|---|
| MICU | MED | 406C |
| | MED | 405C |
| CCU | MED | 404C |
| SICU | SURG | 441C |
| NICU | PEDS | 426C |
| PICU | PEDS | 440C |
| ER | SURG | 412C |
| Anesthesia | ANES | 440C |
| Anesthesia | ANES | 441C |

Perinatal NurseryOB/Gyn 439C

*--students may do a month in the Intensive Care Nursery (ICN). Students must provide documentation from the course director (Dr. Heine, Dr. Livingston, or Dr. Murtha) indicating that the student has indeed completed a month in the ICN to the Registrar's Office.*

# Doctor of Medicine Program Policies

**Academic Calendar.** An academic calendar is prepared by the School of Medicine Registrar's Office and approved by the Curriculum Committee on an annual basis. Every effort is made to include as many academic events and details as possible.

**Academic Dismissal Policy of the Duke University School of Medicine**. Accepted by Duke University School of Medicine Curriculum Committee, August 6, 2003, *Approved by Duke University Medical Center Executive Committee, October 7, 2003.* Any student who fails a for-credit course, whether offered by Duke University School of Medicine or by another school where enrollment in a course is intended for credit toward graduation from Duke University School of Medicine or a joint degree program, in any of the years of the curriculum, shall be deemed to be on "academic warning." The vice dean or his/her designee will notify the student in writing of the status. The student's transcript will reflect the status. The student shall remain on academic warning until a passing grade is achieved for the course. At such time, the warning will be removed from his/her record.

Any student who fails a for-credit course while on academic warning shall be deemed to be on "academic probation" and will be notified of such in writing. The students' transcript will reflect the status. The student remains on academic probation until a passing grade is achieved for the course, at which time the probation will be removed from the transcript.

Any student who fails a for-credit course while on academic probation shall be dismissed from medical school on academic grounds and shall not be allowed to remediate the third course. The student will be notified in writing of the dismissal, which will be reflected on the student's transcript.

A student on academic warning or academic probation may be prohibited from progressing to a subsequent academic year or may be prevented by the Promotions Committee from taking other courses until the student achieves a passing grade for the failed course(s).

The procedure and requirements for achieving a passing grade for a failed course are to be determined by the course director or his/her designee and the Promotions Committee.

Consistent with the Duke University School of Medicine Doctor of Medicine Program guidelines, if a student fails a course, the grade of Fail is recorded on the student's permanent record and cannot be removed, even after successful remediation.

A student on academic warning or probation may withdraw from the school under the Leave of Absence policy in an attempt to remediate the underlying problem(s) producing poor academic performance. He/she may re-enter the school in accordance with the dictates of the Leave of Absence policy.

Students may appeal their academic warning, academic probation, or notification of dismissal according to the Promotions Committee policies outlined in the Duke University School of Medicine Doctor of Medicine Bulletin.

This policy will be in effect for the 2003-2004 academic year. It will be revised as the new curriculum is implemented.

**Academic Standards.** The faculty of the Duke University School of Medicine have the responsibility to define minimum acceptable standards for academic performance. In all courses, minimum passing standards are defined by the course director in collaboration with her or his department chairperson and faculty. These standards are communicated to the students at the beginning of each course. In clinical departments, acceptable professional standards of behavior and attitudes are included in performance evaluation.

Faculty have the responsibility of notifying students who are not meeting minimal standards for passing a course early enough for the student to be able to work toward achieving the minimal standard by the end of the course. In most cases, this is at the midterm of a course. Tutorial help or guidance in correcting deficiencies should be offered to any student so notified.

In addition to performance directly related to course requirements, all students must maintain a high standard of professional behavior. Examples include how a student communicates with course faculty and support staff, their manifestations of responsibility to the school, fellow students, and patients, as well as behavior off-campus that would be deemed unprofessional for students-becoming-physicians. Incidents reported to the vice-dean's office are investigated. The number of

such reports, the severity of the transgression, and other aspects specific to the behavior in question can result in disciplinary action, including dismissal from medical school.

**Approved School of Medicine Holidays for Medical Students (Subject to Change)**

| | |
|---|---|
| Labor Day | 2nd, 3rd, and 4th year |
| Thanksgiving Day (and the day after Thanksgiving) | All |
| Christmas Day (and additional days as outlined on school academic calendar) | All |
| New Year's Day | All |
| Martin Luther King, Jr. Holiday | All |
| Independence Day | 2nd, 3rd, and 4th year (does not apply to first year since they typically finish prior to Independence Day) |

# Attendance Policy

Students in the M.D. curriculum of the Duke University School of Medicine are expected to attend all classroom, clinical, and laboratory activities of their curriculum with these exceptions:

1. Activities that are clearly identified by the course director as non-mandatory attendance activities
2. Activities for which the individual student has received permission inadvance from the course director for an absence, and which may or may not require make-up work
3. Activities for which the student is unexpectedly unable to attend due to illness, accident, or other emergency and for which the student has notified the advisory dean, course director or designee of the reason for the absence, and which may or may not require make-up work

Attendance policy for individual courses is set by the course director(s) and should be made explicit, with consequences for non-attendance, and communicated to students at the beginning of a course. Students may negotiate with individual course directors for absence due to personal events or needs, and reasonable advance requests for absence due to appointments and events that must occur during curricular time should be granted (doctor and dentist appointments, court appearances). For other requests, course directors should take into account the nature of the activity (does it enhance the student's curriculum, is it a once-in-a-lifetime opportunity), the amount of control the student has over the scheduling of the event, the impact of missed time on the curriculum, the student's performance in the class, and the availability of equivalent experience through make-up activities. The course director's decision in these requests is final.

*(subject to revision, June 2006)*

**Attendance Requirements for Medical Students – Holidays.** Students in the School of Medicine are to observe approved holidays as outlined on the School of Medicine Academic Calendar. Holidays that occur on a Saturday may officially be observed on the preceding Friday. Official School of Medicine holidays occurring on Sundays will be observed on the following Monday. Second and fourth year medical students that are completing clinical rotations and scheduled for the weekend or evening shifts (or call) prior to the scheduled and approved holiday, must complete their scheduled shift. For example, a holiday observed on the Monday after the actual holiday, a course instructor and/or department may schedule the student to be on the wards until the end of their shift.

**Commencement.** Graduation exercises are held once a year in May when degrees are conferred on, and diplomas are issued to, those who have completed requirements by the end of the spring semester. Those who complete degree requirements at the end of the summer or fall terms receive diplomas

dated September 1 or December 30, respectively. There is a delay of about one month in the mailing of September and December diplomas because diplomas cannot be issued until they are approved by the Academic Council and the Board of Trustees.

## COMPACT BETWEEN TEACHERS AND LEARNERS OF MEDICINE

Accepted by Duke University School of Medicine Curriculum Committee May 1, 2002; Approved by Duke University Medical Center Executive Committee October 7, 2003

Preparation for a career in medicine demands the acquisition of a large fund of knowledge and a host of special skills. It also demands the strengthening of those virtues that under gird the doctor/patient relationship and that sustain the profession of medicine as a moral enterprise. This Compact serves both as a pledge and as a reminder to teachers and learners that their conduct in fulfilling their mutual obligations are the medium through which the profession inculcates its ethical values. *In this document, the resident is considered a teacher as well as a learner.*

### Guiding Principles

**Duty.** Medical educators have a duty, not only to convey the knowledge and skills required for delivering the profession's contemporary standard of care, but also to inculcate the values and attitudes required for preserving the medical profession's social contract across generations.

**Integrity**. The learning environments conducive to conveying professional values must be suffused with integrity. Students learn enduring lessons of professionalism by observing and emulating role models who epitomize authentic professional values and attitudes.

**Respect**. Fundamental to the ethic of medicine is respect for every individual. Mutual respect between learners, as novice members of the medical profession, and their teachers, as experienced and esteemed professionals, is essential for nurturing the ethic. Given the inherently hierarchical nature of the teacher/learner relationship, teachers have a special obligation to ensure that students and residents are always treated respectfully.

### Commitments of Faculty

- We pledge our utmost effort to ensure that all components of the educational program for students and residents are of high quality.
- As mentors for our students and resident colleagues, we maintain high professional standards in all of our interactions with patients, colleagues, and staff.
- We respect all students and residents as individuals, without regard to gender, race, national origin, religion, or sexual orientation: we will not tolerate anyone who manifests disrespect or who expresses biased attitudes towards any student or resident.
- We pledge that students and residents will have sufficient time to fulfill personal and family obligations, to enjoy recreational activities, and to obtain adequate rest; we monitor and, when necessary, reduce the time required to fulfill educational objectives, including time required for "call" on clinical rotations, to ensure students' and residents' well being.
- In nurturing both the intellectual and the personal development of students and residents, we celebrate expressions of professional attitudes and behaviors, as well as achievement of academic excellence.
- We do not tolerate any abuse or exploitation of students and residents.
- We encourage any student or resident who experiences mistreatment or who witnesses unprofessional behavior to report the facts immediately to appropriate faculty or staff: we treat all such reports as confidential and do not tolerate reprisals or retaliations of any kind.

## COMMITMENTS OF STUDENTS AND RESIDENTS

- We pledge our utmost effort to acquire the knowledge, skills, attitudes, and behaviors required to fulfill all educational objectives established by the faculty.

- We cherish the professional virtues of honesty, compassion, integrity, fidelity, and dependability.
- We pledge to respect all faculty members and all students and residents as individuals, without regard to gender, race, national origin, religion, or sexual orientation.
- As physicians in training, we embrace the highest standards of the medical profession and pledge to conduct ourselves accordingly in all of our interactions with patients, colleagues, and staff.
- In fulfilling our own obligations as professionals, we pledge to assist our fellow students and residents in meeting their professional obligations, as well.

**Course Audit.** With the consent of the appropriate instructor, fourth year students are permitted to audit one course a semester in addition to the normal program. Students who audit a course do not actively participate, submit work, or receive credit for the course. Because of the nature of an audited course, most clinical science courses cannot be audited. However, those offered in a lecture format (as indicated in the Electives Book provided to fourth year students) may be audited with the written permission of the instructor. After the first week of classes in any term, no course taken as an audit can be changed to a credited course and no credited course can be changed to an audit. Further, an audited course may not be repeated for credit. Third year students may not register for clinical courses, even on an auditing basis, except for Practice Year 3.

**Due Process Guidelines.** If a student decides to appeal a decision of a Promotions Board, he or she must submit in writing to the vice-dean the reasons for the disagreement with the decision and any extenuating circumstances he or she wishes to identify within two weeks of receiving notice of the decision. Within a week of receiving the appeal, the vice-dean appoints a Promotions Appeal Committee of three senior faculty, at least one of whom is from a basic science department. The Promotions Appeal Committee reviews the student's request and meets with other faculty or members of the Duke University Medical Center staff who have pertinent information. The student may present her or his appeal in person and may bring a friend from the faculty or student body to assist. The Promotions Appeal Committee reports its decision to the vice-dean who presents this to the student. If the student still is dissatisfied and wishes to appeal further, he or she may request a review of the whole process by the dean of the School of Medicine, with all pertinent documentation provided to that office. The dean's decision is binding.

**Duplicate Diplomas.** In the event that a diploma is misplaced or damaged, the University Registrar's Office, 705 Broad Street, can replace the document for a nominal fee. Please direct requests to Gwendolyn Purnell. The individual concerned must certify in writing that the diploma is truly lost and that if found in the future, the duplicate diploma will be returned to Duke University. Damaged diplomas must be submitted to the University before the duplicate can be issued.

**Education Records/FERPA.** In accordance with the Family Education Rights and Privacy Act (FERPA), students are granted certain rights with respect to their education records. They are:

1. The right to inspect her or his education records.

- Education records include those records which contain information directly related to a student and are maintained as official working files by the university. They do not include records made by faculty and administrators for their own use and not shown to others; campus police records; employment records; records of physicians, psychologists, etc., made or used only for treatment purposes; and records containing information relating to a person's activities after she or he graduates or withdraws from the university.
- Although FERPA regulations do not require institutions to provide copies of the education records, unless to do so would effectively prohibit an individual from viewing her or his records, it is the policy of Duke University Medical School to make such copies available. However, the Medical School may deny requests to release copies of the transcripts of those students in financial default. The Medical School also does not release copies of other schools' transcripts unless mandated by FERPA.

2. The right to amend the contents of the education record to ensure that they are not inaccurate, misleading, or otherwise in violation of the student's privacy or other rights.
3. The right to file a complaint with the U.S. Department of Education concerning perceived failure on the part of the school to satisfy the requirements of FERPA.

FERPA also limits the disclosure of personally identifiable information to others without the student's prior consent with the following exceptions:

*Directory Information:* Certain categories of information are considered to be directory information and do not require the student's prior written consent to be disclosed. However, the Medical School Registrar's Office complies with a student's request to withhold directory information if notice is submitted in writing during the first three weeks of each new academic year; such requests must be renewed annually. Students considering non-disclosure should be aware that negative repercussions may result when inquiries are made by prospective employers, educational institutions, or other interested parties. This is particularly important for graduating students whose final non-disclosure requests continue to be honored until rescinded by the student.

The following have been designated as directory information by the university: name, address, telephone listing, email address, date and place of birth, photograph, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and most recent previous educational institution attended. Class schedule is considered as directory information in the School of Medicine.

*Legitimate Interests:* Prior consent is not required for disclosure of education records to school officials of Duke University who have been determined to have legitimate educational interests, appropriate parties in connection with an emergency, and in response to a court order or subpoena.

The complete university policy regarding FERPA is located on the website: *http:// registrar.duke.edu/registrar/ferpa.htm.*

**Grade Appeal Process.** A student wishing to appeal an official grade or comment must present his/her appeal to the course director within two weeks of the grade being posted. If requested as part of the appeals process, a student should have access to the actual checklists or comments that have been compiled as part of the grade, though identity of the evaluators submitting these data may be kept confidential. If a satisfactory resolution cannot be accomplished, the student may appeal the grade to the Grade Review Panel within two weeks of the meeting with the course director by completing the "Request for Grade Review" form and submitting it to the Office of Curriculum. The Grade Review Panel, designated by the Curriculum Committee will consist of one basic science faculty, one clinical science faculty, and one advisory dean other than the student's dean, and should be convened ad hoc within one month of receiving the notification of appeal. Both the student and the course director will be asked to present information regarding the appeal.

The Grade Review Panel will review the data related to the student's performance in the course and the grading criteria for the course and will make a recommendation to the vice dean regarding preserving or changing the grade. At this time, the vice dean will either uphold the decision of the Grade Review Panel or make his/her independent decision relative to the documentation submitted.

If the student is not satisfied with the outcome of the grade appeal process, s/he may appeal to the dean of the School of Medicine within two weeks of receiving the decision of the vice dean. An appeal to the dean may be made only upon the grounds of improper procedures in the appeals process rather than continued disagreement about the outcome of the process. The dean will review the data related to the process of the appeal and determine whether the process was valid. If s/he finds the process valid, the decision is final and binding. At this time, the registrar's office will be notified of the final grade and it will be reflected on the student's permanent record. If the dean finds the process invalid, a new Grade Review Panel will be convened.

Approved: Coordination and Guidance sub-committee, 5/10/2004
Approved: Curriculum Committee, 6/2/2004

**Grading.** A grading basis is established for each course with Curriculum Committee approval. Currently there are three grading schemes established: Pass/Fail; Pass/Fail/Honors; and Pass/High Pass/Honor/Fail. Where appropriate, certification by the individual faculty person or by the delegated

representative of each departmental chairman that a student has satisfactorily completed requirements for a course shall constitute grounds for a grade of Pass (*P*), High Pass (HP), or Honors (*H*). Honors are reserved for those students who have performed in an exemplary manner in the opinion of the faculty.

An Incomplete *(I*) grade is reserved for those students who have not met all of the requirements of a course because of illness or other such extenuating circumstances, or because of the inability to attain sufficient understanding of course material without additional study. Incompletes that are not satisfied within one calendar year (unless an extension is granted by an advisory dean and the registrar) automatically become grades of Fail (*F*). It is the departmental chairman's responsibility or that of the delegated representative of the departmental chairman to certify that an Incomplete has been satisfied and to so notify the registrar. A passing grade is placed alongside an Incomplete on the permanent and official transcript. Grades of *I* are not removed from the permanent record. All first year courses must be satisfactorily completed before a student may enroll in second year courses. Normally, all second year courses must be satisfactorily completed before a student may enroll in the elective curriculum.

A grade of Fail is recorded on the permanent record of a student by the registrar upon certification by the individual faculty person or the delegated representative of the departmental chairman that unsatisfactory work has been done in the opinion of the faculty. Failures cannot be erased from the permanent record, but the requirements of the course may be satisfied by repeating the course in a satisfactory manner. At that time, a passing grade is recorded on the official and permanent transcript.

**Graduation from Degree Programs.** Students may earn degrees on one of three different dates during the academic year: September 1, December 30, and in early May. Actual ceremonies are only held at the end of the spring term. Anyone who has a degree date of December or September is invited to participate in the May commencement program immediately following her or his actual graduation date.

During the spring semester prior to the senior year, a form letter is sent to each student inquiring as to when (e.g., semester and section - spring semester, section 43) he or she expects to fulfill degree requirements. Diploma forms requesting information such as current local address and how the name should be listed on the diploma are forwarded to prospective graduates as well.

Student records are reviewed by the Registrar's Office staff to ensure that, upon successful completion of the current courses, graduating seniors will fulfill degree requirements on schedule. Those students who are deficient are contacted by the Registrar's Office to inform them of the situation and to discover how they plan to rectify the problem, e.g., add a course, graduate in September instead, etc.

In mid-March, letters are sent to prospective May graduates asking them whether or not they plan to attend graduation exercises. It is extremely important that students wishing to be graduated *in absentia* inform the Registrar's Office of their intentions at this time. Diplomas are sent to such students at their permanent address.

**Health Insurance Portability and Accountability Act (HIPAA).** The Health Insurance Portability and Accountability Act, or HIPAA, requires health care professionals to protect privacy and create standards for electronic transfers of health data. The Office for Civil Rights at the Department of Health and Human Services will enforce the regulations and impose penalties on institutions that do not make a good-faith effort on privacy and security.

HIPAA came about because of the public's concern about how health care information is used. HIPAA gives patients more control over their own health information. All Duke University School of Medicine students are required to complete online HIPAA training on an annual basis. For more information about HIPAA, please refer to the following website, *http://www.dukehealth.org/Privacy/HIPAA.*

**Honor Code.** All entering medical students are required to sign an Honor Code attesting to high ethical standards in school performance. The rights and responsibilities of students with regard to university-wide regulations pertaining to student conduct can be found in the current Bulletin of Information and Regulations of Duke University.

- The students of the Duke University School of Medicine understand that it is a privilege to learn the practice of their chosen professions in a clinical setting. At the

same time, they recognize the obligation that they have to the health and welfare of their patients and to their patients' families. As they enter professions in which they will have an extraordinary responsibility for others' lives and health, students will strive to hold themselves to the highest standards of academic integrity and conduct. As part of their education and training, students must begin to practice the ethic of service that they will uphold for the rest of their professional lives. Since training in ethical and professional behavior is integral to the education of the health professional, violations of this Honor Code will be considered as an academic issue and may jeopardize advancement and graduation in the same way as other academic matters.

- The Honor Code is written to promote a sense of intellectual honesty, trust, responsibility, and professionalism among students, faculty and staff of the School of Medicine. It should be understood that these guidelines represent standards to strive for, and that not every infraction will necessitate investigation. It should also be recognized that this honor code cannot anticipate every potential offense and that unethical behavior not specifically mentioned in this code can still be investigated. Specific incidents will be considered in the context in which they occur. In addition, the magnitude and chronicity of infractions will be taken into account.

To uphold the honor code, the student will:

- demonstrate intellectual integrity and honesty,
- show concern for the welfare of others and act responsibly,
- demonstrate respect for the rights of others, build trust in professional relationships, and demonstrate professional demeanor.

For specifics on the honor code, students may contact the Office of Student Affairs.

**Internship Interviews.** A total of six working days may be taken by fourth year students for internship interviews. However, no more than three days can be missed during a four week rotation. The student must give the instructor of the affected course sufficient notice of his or her intention to be away for an interview so that a mutual determination can be made as to the best time to be absent. This ensures that the learning experience in that course is in no way jeopardized.

**Leave of Absence.** A student, after presenting a written request to his or her advisory dean, may be granted an official leave of absence for personal or academic reasons for two or more consecutive terms, but not to exceed one calendar year. If approved, the advisory dean provides written notification including applicable beginning and ending dates to the student, the registrar, and the director of financial aid. The student must apprise the advisory dean in writing of her or his wish to return to the Medical School or to extend the personal leave at least 60 calendar days prior to the anticipated date of re-entry. The student desiring an extension beyond one calendar year may be required to apply for readmission to the School of Medicine. When a leave of absence is taken, the vice-dean may require the student upon return to repeat some or all of her or his previously completed academic program. To be eligible for a voluntary leave of absence, a student must have met all financial obligations to the university.

Permission to take a leave of absence for medical reasons also must be sought in writing and is usually granted for 30 days. If additional medical leave time is desired, the student's physician is requested to submit documentation concerning the need for a continuation of the leave. A medical leave extending beyond 90 days requires a statement from the student's physician attesting to her or his fitness to return to the Medical School as a full-time student.

For purposes of deferring repayment of student loans during a school-approved leave of absence, federal regulations limit the leave to six months.

In all cases of leave of absence, the student is required to complete the full curriculum to be eligible to earn the M.D. degree.

**Medical Licensure.** The United States Medical License Examination (USMLE) is a three-step examination for medical licensure in the United States. USMLE is sponsored by the Federation of State Medical Boards (FSMB) and the National Board of Medical Examiners (NBME). It is governed through a jointly appointed composite committee consisting of representatives from the FSMB, the NBME, the Education Commission for Foreign Medical Graduates (ECFMG), and the public. Step 1

assesses how well a student can apply the knowledge and understanding of basic biomedical science, with an emphasis on principles and mechanisms of health, disease, and modes of therapy. There are two parts of Step 2. The first part, Step 2 CK (Clinical Knowledge) assesses how well a student can apply the medical knowledge and understanding of clinical science considered essential for the provision of patient care *under supervision*, including emphasis on health promotion and disease prevention. The other part, called Step 2 CS (Clinical Skills) assesses clinical performance of candidates through encounters with a number of standardized patients. Candidates take a medical history and for some patients conduct a physical examination. There is also a clinical note that is written after seeing the patient. Steps 1, 2 and 2 CS must be passed to be eligible for Step 3. Step 3, typically taken in the first year of postgraduate training, assesses how well a resident can apply the medical knowledge and understanding of biomedical and clinical science considered essential for the *unsupervised practice* of medicine, with emphasis on patient management in ambulatory settings. Steps 1, 2 CK and 3 are computer-based and must be taken in certified Prometric testing centers. Centers closest to Durham are in Raleigh and Greensboro. Step 2 CS is taken at one of five specially designed testing centers around the country. More information can be obtained from the USMLE website *(http://www.usmle.org)*.

Effective for all graduating classes of 2005 and beyond, Duke University medical students are required to take Steps 1, 2 CK and 2 CS prior to graduation. Students may take these examinations at any point throughout the curriculum. Duke Medical School considers licensure to be the responsibility of the individual, so passing is not a requirement for progress through our curriculum. The Duke curriculum is not directed to prepare students specifically for licensure examinations; however, satisfactory performance in medical school should provide sufficient information and experience to pass these exams.

According to the NBME, "In order to be eligible to register for USMLE Step 3, students and graduates of LCME- or AOA-accredited medical schools will be required to not only meet current examination requirements (i.e., passing Step 1 and passing Step 2 CK) but also to pass Step 2 CS if they: (a) have graduation dates in 2005 or later, or (b) have graduation dates prior to 2005 and have not passed the CK component of Step 2 taken on or before June 30, 2005." More information is available at the USMLE website. Applications for Steps 1 and 2 are available on the National Board of Medical Examiners website *(http://www.nbme.org)*.

**Medical Student Performance Evaluations (MSPE's).** During the fall of the fourth year, the advisory deans write an evaluation for each of their advisees. The purpose of the Medical Student Performance Evaluation is to summarize the student's medical career and accomplishments and to give training programs some insight into a student's abilities and assets. Evaluations are submitted to residency programs on November 1. Detailed information concerning the evaluation is sent to the student by the Office of Student Affairs in early fall of the fourth year.

**Missing Grades.** The Curriculum Administrative Group passed a mandate that all grades must be supplied to the Registrar's Office prior to a student receiving their degree. Every effort will be made by the Registrar's Office to collect these grades. However, if within one month of graduation this does not occur, students will be requested to obtain the missing grades for their permanent records. Diplomas will be withheld until such time as all grades are submitted for the student.

**Payment Policy For Students Who Do Not Hold US Citizenship or US Permanent Resident Status.** Each non-US citizen accepted for enrollment at the Duke University School of Medicine or a Medical Center Allied Health Program shall make, or cause to be made, a payment, hereafter called a deposit, to the Office of the Bursar for the purpose of ensuring financial stability to meet each full year's educational costs in advance of matriculation. The amount of this deposit shall be equal to the total costs of a student's first, second, third AND fourth years of medical school at Duke University and includes tuition and fees and living expenses. The Medical School will maintain these funds in an escrow account and will distribute the funds to the student in accordance with Duke University policy.

Budgets are approved annually by the Duke University Board of Trustees and this information is generally available prior to the May 15th AAMC notification deadline. The amount of the deposited shall be at least equal to the school's approved unmarried first year student budget for the applicable program of student (medicine or allied health).

The deposit shall be received by the Office of the Bursar no later than forty-five (45) days prior to the beginning date of classes to guarantee enrollment in the fall semester for the first year

student. The Full deposit shall be credited to the student's ledger account in the Office of the Bursar.

During the period for which the deposit has been made, the Bursar shall make withdrawals by the due date set by the institution in the amount of tuition and fees owed to the University. The amount of such withdrawals shall be the same as that charged to other students in similar programs of study for the applicable class year.

At the beginning of each semester, the Office of the Bursar shall prepare a check for the deposit for the student to cover living and other necessary education expenses. The amount of the check shall be based on a prorated sum from the living expense portion of the school's approved student budget.

In the event the student withdraws voluntarily or is withdrawn administratively for academic or any other reason, the Bursar shall issue a check for the full amount of the unused portion of the deposit. Such checks shall be made payable to the source that supplied the deposit. The amount of the check shall be prorated if the deposit was supplied from more than one source. Any income resulting from investment of the deposit until appropriate portions of the deposit are used or needed for educational purposes shall belong to Duke University of management of the account.

If you have any questions regarding this policy, please contact the Office of the Bursar, or the Duke University School of Medicine Admissions Office.

**Policy for Completion of Coursework in First Year During the Term of the Course.** The nature of the first year curriculum is rapid-paced and cumulative, such that each course is considered prerequisite for the successive courses. Efforts are made by course instructors, the Associate Dean for Basic Science, and advisory deans to proactively identify students who are having academic difficulty or who, for reasons of illness or other extenuating circumstances, are temporarily unable to attend class. In these situations, the assistance of student tutors, special guidance by course directors, or other forms of academic or counseling support may be offered to help the student accomplish course goals. In extenuating circumstances and at the discretion of the course director(s), the student may negotiate to delay due dates, tests or presentations, or to retest or revise coursework during the term of the course(s).

**Incomplete Grades.** If completion of the course requirements results in a "Pass" or "Honors" grade, the "Incomplete" is not recorded on the transcript. If the student is unsuccessful in satisfactorily completing course requirements or does not enact the "Plan" by the agreed upon deadline, a grade of "Fail" is recorded. The "Plan for Course Completion" will become a part of the student's permanent record, and submission of the final grade for the course will constitute verification of completion.

If a student has multiple "Incomplete" grades and "Plans for Course Completion" that preclude completion of coursework in a timely manner, the Promotions Committee may recommend to the Vice Dean a delay in further progression in the curriculum. If the Promotions Committee determines that, despite an approved "Plan for Course Completion", the student is not adequately prepared to continue in the curriculum, a delay in further progression may be recommended to the Vice Dean, even though no "Fail" grade has been recorded.

**Fail Grades.** If a grade of "Fail" is received in a course, either because of major deficiencies in meeting course requirements or failure to clear an "Incomplete" grade as described, the "Fail" grade will become a permanent part of the student's transcript. With the course director's advice and consent, the Promotions Committee may recommend to the Vice Dean that the student remediate the course prior to promotion to the next year. Remediation of failed courses may occur only while other courses are not in session in order to avoid further academic difficulty. When deficiencies in coursework are major or in multiple courses, the Promotions Committee may recommend that the student repeat the entire course(s) the following year.

**Promotion.** Each student's record is reviewed periodically by a Promotions Board composed of course directors (or their designees) and faculty from various departments. The Promotions Board is assigned to a class and will follow the student longitudinally throughout his or her career. Recommendations by these boards are made to the vice-dean who may select one of several options:

1. Promote students whose work is satisfactory;
2. Warn students whose work is less than satisfactory that they must improve their scholastic endeavor and require such students to remediate, retake, or review specific courses, or to undertake other actions that may assist in the correction of deficiencies;

3. Place on probation students whose work is unsatisfactory or who have demonstrated unprofessional behavior; or
4. Request the resignation of any student who is considered an unpromising candidate for the degree of Doctor of Medicine.

A student wishing to appeal a decision may do so to the vice-dean within two weeks of notification.

The vice-dean, with the advice of the dean of the School of Medicine, reserves the right to require the withdrawal of any student at any time if, in his opinion, the student should not continue in the School of Medicine.

**Reciprocal Agreements with Neighboring Medical Schools.** Under a plan of cooperation between the Duke University School of Medicine, the Wake Forest School of Medicine, the East Carolina University's Brody School of Medicine, and the University of North Carolina-Chapel Hill School of Medicine, degree candidates of one institution may participate in elective courses for credit at one of the other schools. Courses taken usually are ones not available at the home institution or not offered at times that can be accommodated by the students' schedules. Enrollment in another institution is limited to one term and is contingent upon available space in the course(s). These courses are regarded as "in house" electives at Duke and, as such, appear on the transcript with the awarded grades. Students involved in this program are assessed the current Duke tuition and fees. Interinstitutional visitors to Duke are charged neither tuition nor student health fees for this type of enrollment.

**Important Note:** The amount of credit granted for an interinstitutional course is the same as that awarded for a comparable course at Duke unless the course concerned is (1) a sub-internship, or (2) offered for fewer credits and meets less often than its Duke counterpart. Students can earn a maximum of four credits for subinternships taken at any school other than Duke or UNC at Chapel Hill.

**Re-admission after Withdrawal.** Students who wish to re-enter the medical program after withdrawing from the School of Medicine must provide the following to the associate dean for student affairs:

1. A statement detailing:
   - The reason(s) for withdrawing from the program, including relevant history leading up to the decision;
   - How the issues relating to those reasons have been addressed;
   - A discussion as to why the student is re-applying to the Medical School, including information concerning changes in situation, reasons for wishing to pursue a career in medicine, and an explanation as to the chosen time for return;
   - A chronological list and brief description of actions since withdrawing from the Medical School;
2. An updated *curriculum vitae;*
3. A transcript of any academic courses taken since the withdrawal;
4. Two letters of reference from people with whom the student worked during the withdrawal period.
5. In the event of a withdrawal because of medical reasons, the School of Medicine requires an evaluation from Student Health to assess readiness for returning to the School of Medicine.

The applicant is scheduled for two interviews with either administrative staff or faculty in the Medical School. After these meetings take place, a committee comprised of the vice-dean and the advisory deans convenes to review the information submitted by the applicant, the interview reports, and the student's previous, academic file and to determine if re-admission is appropriate. The decision of the committee, which is final, is provided in writing to the applicant and to the financial aid and registrar's offices.

**Refunds to Students Assessed Charges when Studying Away for Elective Credit**. Students taking courses away from Duke are assessed the current tuition for those courses for which he or she earns credit at Duke. However, if the visited institution requires payment of any tuition or fees, the student can receive a refund from Duke for these expenses. To do so, the student must bring to the Medical

School Registrar's Office after completion of the course(s): (a) a copy of an invoice or a letter from the institution outlining the fee requirements, and (b) a copy of her or his canceled payment check. Upon receipt of these items as well as the official grade report, the Registrar's Office reimburses the student.

Duke does not refund students for fees/tuition paid for a study away experience that is terminated prior to its completion.

**Satisfactory Academic Progress.** Satisfactory academic progress for students in the School of Medicine is defined as the successful completion of all requirements necessary for the advancement from one year to the next. These requirements are as follows:

*First to Second Year*. Completion of core basic science courses in one calendar year.

*Second to Third Year*. Completion of core clinical science courses within 14 months.

*Third to Fourth Year*. Completion of 36 basic science credits within ten months (12 months for master's or scholarship students).

*Fourth Year to Graduation.* Completion of 32 clinical science credits within one calendar year.

In unusual circumstances (including illness, remediation, or irregular sequence of courses) the determination of satisfactory progress for academic purposes is made by the vice-dean.

For financial aid purposes, federal regulations establish the maximum time frame for completion of the program at 150 percent of the minimum time required to complete the program. Any student exceeding the 150 percent maximum time frame is ineligible for Title IV (Federal Stafford Loans) student financial aid funds.

**Retesting, Absences, and Testing Policy:** The Duke University School of Medicine curriculum is an intense, fast-paced curriculum designed to provide students with the core knowledge and skills necessary for early clinical exposure, for a productive year of individual scholarly activity in the third year, and for success in the transition to graduate medical education. As such, the core elements of the curriculum (first year coursework, second year core rotations and intersessions and fourth year Capstone course) must be accomplished in a timely manner in order that an educational foundation is established. The School of Medicine has established the following policies and procedures to guide students and faculty regarding the issues of absence, testing, retesting, and remediation in core elements of the curriculum.

## Absence from academic activities:

**Excused absences:** Students must request and negotiate excused absences from required course activities with the director of a course or clerkship in situations such as illness or health care appointments, attendance at scientific or professional meetings, personal or family emergency, or major life events. Course directors are responsible for making clear to students which portions of their courses require attendance and any limit on excused absences without negative consequence. These absences should be negotiated in writing (email or letter) as far in advance as possible and a plan established for completion of any activity or work missed. Requests made on short notice for previously planned absences will likely be denied. Absences announced on short notice due to illness or emergency may still be excused with proper notification of the course director or advisory dean, and unannounced absences may be excused in cases of incapacitation to the point of inability to make these contacts.

**Unexcused absences:** Any absence without prior notification of the course director or advisory dean is considered unexcused unless documentation of inability to make those contacts is provided. Any absence not approved by a course director for a required part of a course is considered unexcused. An unexcused absence will have a negative impact on the student's grade or evaluation, and may result in an honor code charge if deemed unprofessional behavior.

**Testing:** Students are expected to take tests, quizzes, examinations, and standardized patient exams, and to turn in assignments at the scheduled time unless they have obtained an excused absence from the course director or are incapacitated to the point of inability to make this contact. Delaying an examination for academic gain (i.e. to improve performance) is a violation of the Honor Code. A student missing an examination without an excused absence will receive a "0" score and will not be eligible for a make-up exam. If the student has an excused absence from an examination, the student should negotiate a date to take the exam with the course director. It is expected that these make-up exams

should occur within the time frame of the course if possible and permitted by the course director, or prior to the subsequent Promotions Committee meeting if it is a final exam in the first year, or within 12 weeks of the clerkship ending in a second year course.

**Retesting:** A student who fails an examination within a course may negotiate with the course director for remediation including no more than one reexamination. Course directors may grant this single reexamination but are not obligated to do so. This will occur in advance of the subsequent Promotions Committee meeting in the first year or within a year of the original exam in the second year. No grade is reported while a retake is pending. If the retake does not occur in a timely fashion, a grade of "fail" will be reported. If the student passes a reexamination and the course director deems that s/he has passed the course, any "not reported" grade will be removed from the transcript and replaced with a "pass". Any student permitted a retest in a course due to failure is not eligible for "honors". If the student fails a reexamination and thereby fails the course, the student will receive a "fail" grade on the transcript.

**School of Medicine Severe Weather Attendance Policy.** The School of Medicine will handle the cancellation of classes in the following manner:

- The first and third year medical, the first year PA, all Path Asst. and Physical Therapy students will follow the Provost's decision about cancellation of classes. Course directors, mentors and faculty are aware of this policy so that individual decisions will not have to be made.
- For all second, fourth year medical and second year PA students, you will need to follow the assigned hospital decisions related to the severe weather policy. You are considered NON-ESSENTIAL personnel and should not report to work in severe weather. Please stay tuned to the DUMC severe weather policy alerts and act accordingly.

These decisions can be determined by calling 684-INFO (4636) or by visiting *www.duke.edu.* Students and faculty can also call the SOM registrar's office at 684-2304 or the Office of Curriculum at 684-5967 where this decision is echoed.

**Students Eligible for Third Year Credit for Prior Graduate Work. MD/PhD Students:** Students in the combined Duke MD/PhD program will automatically receive third-year credit upon successful completion and defense of their PhD. If students do not complete their PhD, but complete requirements for a terminal Master's degree, they must prepare a written thesis in concordance with the School of Medicine guidelines, and identify an appropriate third-year Study Program Director who will review the thesis and scope and nature of the graduate work. The Study Program Director will present a recommendation to the Third Year Committee, which will make decisions regarding 3rd-year credit on a case-by-case basis. Students pursuing this option for 3rd-year can be evaluated for Pass or Honors.

*Students with prior graduate work culminating in a PhD*: After acceptance to the School of Medicine, applicants who hold Ph.D. degrees, typically in the biomedical or preclinical sciences, may also be considered for a three-year M.D. degree program. This program consists of the core basic science courses during the first year, the core clinical rotations during the second year, and clinical requirements in the final year. Students whose Ph.D.'s have not been awarded prior to expected Medical School matriculation are not eligible for this program. To apply for 3rd-year credit for the Ph.D., students must fill out an application available at the Medical School Admissions and Registrar's offices, and must submit this application to the registrar's office by the end of the first year of enrollment. The registrar's office will identify an appropriate 3rd-year study program director to review the nature and scope of the research, and present a recommendation to the 3rd-Year Committee. The 3rd-year Committee will review the request for 3rd-year credit, and make a recommendation to the vice dean. The vice dean will then make a final decision and inform the student, the 3rd-Year Committee and the rRegistrar's office. If graduate work is accepted for credit the 3rd-year thesis requirement will be waived. The student will not have the option to receive Honors for his/her thesis.

**Study Away Policy.** Students in the M.D. Program at Duke who have maintained a high level of academic performance throughout their first two to three years are eligible to study at another institution and receive academic credit at Duke for this experience. Students must have successfully complet-

ed all courses in the first two years at Duke before they are eligible to study away for credit. It is **unlikely** that students with any failures or marginal performances at Duke will receive permission. A student may not study away from Duke for credit during the four weeks prior to his or her graduation. Transfer students who are taking the two clinical years are not eligible to study away. Study Away applications are available either in the registrar's office or on the *http://registrar.mc.duke.edu* website. The applications for third year Study Away are forwarded to the Third Year Committee, which is notified by the Promotions Board if any second year students are ineligible, and to the Duke Risk Management Office for approval. **All Study Away for credit (including military rotations) must be approved in advance by these three entities.** Third year students who study away are liable to pay Duke's tuition as well as any tuition at the visited school. Fourth year Study Away must be approved by the student's advisory dean and the Duke Risk Management Office. Credit toward the Duke M.D. degree is not to exceed nine units of clinical elective credit unless recommended by the Committee (exceptions, military students).

To obtain approval for work taken away from Duke University, the student must first contact her or his advisory dean to determine if qualified. Transfer students and students receiving grades of "Fail" in any of the core basic or clinical science courses of the first and second years even after successful remediation are not eligible for this option. Application forms, as well as additional information, may be secured from the Medical School Registrar's Office for study away during the fourth year. Copies of the elective books of selected medical schools are kept in the Reserve Room at the Medical Center Library and are available for student usage.

Students must register for any study away experience during the regular web registration period and indicate the term (via section number) during which the experience is to occur. Clinical science courses are designated as STDYAWAY 410C, 411C (UNC), 421C (WFU), and 431C (ECU). **The amount of credit awarded for study away work is based upon that given for a comparable course at Duke. With the exception of those at UNC-Chapel Hill, subinternships taken extramurally can earn a maximum of four credits at Duke**. The current Duke tuition, rather than that of the visited institution, is assessed for extramural clinical science courses.

Fourth year students may usually only study away as visiting students at other institutions for one or two electives. Students must fill out an application from the Registrar's Office, get permission from the visited institution, and complete an evaluation at the end of their experience.

**Technology Fee.** Effective fall 2003, all matriculating first year and second year students in the School of Medicine will be assessed a mandatory technology fee. This includes students enrolled in the following programs: *Doctor of Medicine, Doctor of Physical Therapy, Physician Assistant, and Pathologist's Assistant.* The fee will not only cover hardware such as laptop and handheld device, but service, software and technical updates to comply to all Duke Health System compliance guidelines.

**Transcripts of Academic Record and MSPE's**. A student may obtain a copy of her or his academic transcript by completing a transcript request form, or sending a letter or FAX to:

Office of the Registrar

Box 3878, DUMC

Durham, NC 27710

FAX: 919-684-4322 (Electronic requests must include facsimile of the requestor and the original signature of the requestor.)

Students may also request transcripts online through ACES. Transcripts are released at no charge only upon the written request of the student concerned.

After graduation from the School of Medicine, copies of the MSPE may be obtained from the Registrar's Office. (It should be noted, however, that the Medical School forwards copies of the MSPE directly to the institution to which an individual is applying. It is against the school's policy to release copies to the student.

Transcripts and records submitted from other schools that are on file at the Medical School cannot be duplicated and released from the registrar's office.

**Visiting Students**. The School of Medicine provides opportunities for visiting medical students to enroll in clinical elective courses for a maximum period of 8 weeks. Approved visiting students are

permitted to enroll in courses only after the registration period for the applicable semester has concluded for Duke medical students, and are required to adhere to the Duke academic calendar. The School of Medicine does not offer long term or extensive clinical experience sufficient to satisfy the clinical educational requirements of other medical schools. Payment of a non-refundable application fee (currently $50, subject to change) must accompany all applications. If approved, a registration fee of $200 for students from LCME approved medical schools and $2000 for students from international medical schools is required. Payment should be made prior to the start of the approved elective period or within the first week of enrollment. Registration fees will be refunded in full if the elective is cancelled prior to the approved start date. Notice of elective cancellation should be provided via email to the Visiting Student Coordinator. If the student withdrawals after the first day of the approved elective period, no refund will be provided. The **optional** student health fee for a visiting student is set at $50.00 for each 4-week period of enrollment. If selected, payment should be made at the time services are provided by the Student Health Center. Should these fees not be paid in full as noted, the student may be withdrawn from the program and forfeit all fees paid up to that time. For information write to: Visiting Student Coordinator, Box 3878, Duke University Medical Center, Durham, North Carolina, 27710, or access the website for the Office of the Registrar, School of Medicine, *http://medschool.duke.edu/modules/som_registrar/index.php?id=13*

# Admission Procedures

Maturity, strong study habits, intelligence, character, humanism, and integrity are essential qualifications for admission. Beyond this, premedical students should strive for an education that develops abilities to observe critically, think analytically, and work independently. Though knowledge of basic scientific principles should be secured, the competence with which premedical students conduct their undergraduate careers is of more importance than the specific subjects which they study.

**Application for Admission:** The Duke University School of Medicine participates in the American Medical College Application Service (AMCAS), and application to the School of Medicine must begin by submitting the electronic AMCAS application. The application may be accessed at the following website: http://www.aamc.org/students.

Upon receipt of the application data from AMCAS, all applicants receive a Duke University School of Medicine Supplemental Application. When the Supplemental Application and application fee are submitted, a favorable screen by the members of the admission screening committee of an applicant's AMCAS application and Supplemental Application materials generates an invitation for a personal interview. Applications should be submitted between **June 1** and **November 15**, the deadline for all materials to be received by AMCAS. **Applicants are urged to file their AMCAS applications as early in the admission cycle as possible since interview slots fill quickly**. AMCAS may take as long as 4-6 weeks to process and verify your application and transcripts. It is the applicant's responsibility to ensure that her/his application is verified by AMCAS in order for AMCAS to transmit your application data to Duke by the Duke AMCAS Application deadline (November 15$^{th}$).

Depending on the volume of applications, we cannot always guarantee an on-campus interview. Duke offers regional interviews at various cities throughout the United States. These interviews are conducted by Duke Medical School Alumni who have been carefully selected by the Committee on Admissions. Applicants who interview at a regional location are at no disadvantage and their applications are given the equal consideration. The final deadline for receipt of the Supplemental Application is December 1 but we strongly encourage applicants complete both the AMCAS Application *and* the Duke University School of Medicine supplemental application 4-6 weeks prior to the posted deadlines. Applicants who complete their applications earlier in the process on average have a broader range of interview dates from which to select. Our interviews are conducted from mid-September through mid-February of each year.

**Requirements:** Admission to the School of Medicine requires a minimum of 90 hours of approved college credit including one year of college English or a university writing course, one year of inorganic chemistry, one year of organic chemistry, one year of physics, one year of biology and/or zoology, and one year of calculus. An introductory course in biochemistry and/or microbiology during

the senior year is strongly recommended. All science requirements must be complete not more than seven years prior to matriculation. The Medical College Admission Test (MCAT), administered by the American College Testing Programs and Services, P.O. Box 414, Iowa City, Iowa 52240, is required of all applicants. This test is administered in April and August of each year at numerous colleges throughout the United States. If possible, applicants should arrange to take this test in April of the year they plan to submit applications for admission. MCAT scores dated earlier than four years prior to the year for which an applicant is seeking are not considered.

**School of Medicine Technical Standards.** All candidates for the M.D. degree must possess the physical and mental skills and abilities necessary to successfully complete the medical school curriculum. To achieve the optimal educational experience, students are required to participate in all phases of the training program.

The study of medicine is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional and social abilities are needed to be a successful student. Students must possess all of the abilities listed in the five categories below. The use of an intermediary that would, in effect, require a student to rely on someone else's power of observation and/or communication will not be permitted.

I. Observation. a) Visually observe materials presented in the learning environment including audiovisual presentations, written documents, microbiology cultures, microscopic examination of microorganisms, tissues and gross organs in the normal and pathologic state, and diagnostic images. b) Observe patients accurately and completely, both at a distance and directly. This requires functional vision, hearing, and sensation.

II. Communication. a) Effectively speak, write, hear, read and use a keyboard; b) Perceive non-verbal communications, including facial expressions, body language, and affect; c) Communicate effectively and sensitively with patients and their families via speech as well as reading/writing; d) Communicate in oral and written form with the healthcare team in an effective, accurate, and efficient manner.

III. Motor. a) Elicit information from patients via palpation, auscultation, and percussion, as well as carry out diagnostic maneuvers; b) Execute movements reasonably required to provide general medical care and emergency treatment to patients. These skills require coordination of gross and fine motor movements, equilibrium, and sensation; c) Manipulate equipment and instruments to perform basic laboratory tests and procedures as required to attain curricular goals. (e.g. needles, stethoscope, ophthalmoscope, tongue blades, intravenous equipment, scalpel).

IV. Intellectual/conceptual, Integrative, and Quantitative Abilities. a) Perform calculations necessary to solve quantitative problems as required by the curriculum; b) Collect, organize, prioritize, analyze and assimilate large amounts of technically detailed and complex information in a timely fashion. This information will be presented in a variety of educational settings, including lectures, small group discussions, and individual clinical settings. The applicant should be able to analyze, integrate, and apply this information appropriately for problem solving and decision-making; c) Apply knowledge and reasoning to solve problems as outlined by the curriculum; d) Comprehend the three dimensional spatial relationships of structures; e) remain awake and alert.

V. Behavioral, Emotional and Social Attributes. a) Possess the emotional health to fully apply his/her intellectual skill, exercise good judgment, and to complete all responsibilities attendant to the diagnosis and care of patients; b) Develop a mature, sensitive, and effective relationship with patients and colleagues; c) Tolerate the physical, mental and emotional stress experienced during training and patient care; d) Possess qualities of adaptability, flexibility, and the ability to function in the face of uncertainty; e) Form a compassionate relationship with his/her patients while maintaining appropriate boundaries for a professional relationship; f) Behave in an ethical and moral manner consistent with professional values and standards; g) Exhibit sufficient interpersonal skills, knowledge, and attitudes to interact positively and sensitively with people from all

parts of society, ethnic backgrounds, and belief systems; h) Cooperate with others and work corroboratively as a team.

The faculty of the Duke University School of Medicine recognizes its responsibility to present candidates for the M.D. degree who have the knowledge, attitudes, and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care. Candidates for the M.D. degree at Duke will be prepared to enter postgraduate medical education as general physicians able to undertake specialty education.

The Committee on Admissions is responsible for adhering to these technical standards during the selection of medical students.

**Selection:** The earliest date of notification of acceptance is in early March for applicants entering the following August. Those selected to interview are carefully evaluated by the Committee on Admissions. A personal interview is conducted at Duke for those applicants with competitive credentials. Candidates may have personal interviews with regional representatives of the Admissions Committee, who are Duke School of Medicine alumni. Those candidates who demonstrate the most promise for exceptional performance in their future practice of medicine are admitted on the basis of merit. In order to ensure enrollment, accepted candidates must return a signed agreement within three weeks after notification. Since admission is offered in advance of matriculation, it is provisional upon the successful completion of any incomplete, premedical, and required subjects as well as the continued demonstration of scholarship in college course work.

Applicants who are not U.S. citizens or who are not Lawful Permanent Residents (LPR) of the United States are granted equal consideration for admission to the medical school but if admitted must submit a payment covering **all four years'** tuition and fees prior to matriculating at Duke. A "green card" **must** be in the incoming students possession at the time an offer of admission is extended in order to receive an exemption from the payment policy.

**Transfer:** Duke University School of Medicine does not accept transfer students.

**Advanced Placement:** After acceptance to the School of Medicine, applicants who hold PhD degrees in biomedical or preclinical sciences may apply to be considered for a three-year, MD degree program. This program consists of the core basic science courses during the first year, the core clinical rotations during the second year, and clinical electives during the third year. If the PhD has not been awarded prior to matriculation, the student is not eligible for this program. Applications to receive credit for the PhD can be obtained at the Medical School admissions and registrar's offices, and must be submitted to the registrar's office by the end of the first year of enrollment. The Third Year Committee will review the request and make a recommendation to the vice-dean. The vice-dean will then make a final decision and inform the student, the Third Year Committee, and the registrar's office.

**Re-application:** Applicants who wish to re-apply should contact AMCAS to complete a new AMCAS application. Supporting information will be transferred to the new application. These documents are kept on file for three years. To be seriously considered, re-applicants must demonstrate significant additions of experience or coursework to the original application.

# Immunization Requirements

**Immunization and Health Record.** North Carolina State law and the Infection Control Committee at the Medical Center require all new students to provide, within 30 days of matriculation, evidence of immunity to certain vaccine-preventable illnesses. Upon acceptance, students receive the Student Health Immunization Form and Report of Medical History which should be completed and returned prior to the start of Duke classes to the Director of Student Health Center, Box 2899, DUMC, Durham, North Carolina 27710.

Duke University Medical Center and the School of Medicine hold the health and welfare of their students, patients, and faculty in the highest regard. Students' failure to comply with North Carolina state immunization requirements and those of the School of Medicine may result in the student not being allowed to continue coursework or to take exams until all immunization requirements are met. For questions or concerns about immunization requirements, please contact the Student Health Department at *dshs_immunizations@mc.duke.edu* or by phone at 919-681-WELL.

### Tuberculin Skin Test (PPD) Requirements during the Fourth Year

As a requirement for graduation, all students must obtain tuberculin skin tests after completion of second year rotations in the fall of the third year and again during the spring of the fourth year. Fourth year students that do not graduate in the spring, but rather the summer or fall terms must obtain the PPD during their last clinical rotation. The Registrar's Office and Student Health Center coordinate the schedule for students to receive the PPD tests at the Student Health Center. *Individuals who intend to study away during these time periods must make arrangements with Sharon Denny, Immunization Coordinator, Student Health Center, to take the PPD test before leaving for the study away experience*. Ms. Denny can be reached at 681-4912 or via email at DSHS_Immunizations@mc.duke.edu. Students may obtain printouts of their immunization records at no cost from the Student Health Center. Students should contact Ms. Denny should they have any questions or concerns pertaining to immunization requirements.

# Combined Degree Programs

**Medical Scientist Training Program.** The Medical Scientist Training Program is designed for highly qualified students strongly motivated toward a career in medical sciences and academic medicine. It provides an opportunity to integrate graduate education in one of the sciences basic to medicine with the full clinical curriculum of the School of Medicine. The program requires, on average, six to seven years of study and leads to both the M.D. and Ph.D. degrees. Although the special emphasis of this program is on basic medical science, the trainees, because of their education in clinical medicine, have a remarkable range of career opportunities open to them. Graduates of this program follow one of two broad paths. Some embark directly on careers in teaching and research in one of the basic medical sciences while maintaining strong ties with clinical science as a result of their combined training. Others enter residency programs before pursuing investigative and teaching careers in clinical medicine, carrying with them strong academic backgrounds which allow them to conduct fundamental research with a foundation of superior training and experience in basic sciences.

*Eligibility.* Applicants must meet the admission requirements of both the Medical School as a candidate for the M.D. degree and the Graduate School as a candidate for the Ph.D. degree. Most candidates apply for admission to the first year of the program but, in special cases, applications can be accepted from students who are in residence in the Medical School or Graduate School of Duke University. In addition to the minimum requirements for acceptance to the Medical School and the Graduate School, advanced course work in science and mathematics and prior research experience (or other evidence of research aptitude) counts heavily in the selection of candidates.

*Financial Support.* Students admitted to the first year of the program receive a traineeship award (National Research Service Award) consisting of a stipend and full tuition allowance from the National Institutes of Health. Currently the annual stipend is $24,000 (excluding health insurance). Financial support from that award can be furnished for up to six years assuming normal progress. These six years need not be consecutive; this permits flexibility in funding in case more than six years are required for completion of the curriculum. Funding by the NIH is limited to citizens or permanent residents of the United States.

*The Training Program.* This program is designed to offer trainees great latitude in the selection of course material. Basic requirements are two academic years composed of the first basic science year and the second clinical science year of the curriculum for medical students at Duke University. Following completion of the second year, the trainee enters the graduate program to complete the requirements for the Ph.D. degree. One more academic year of elective clinical study is necessary to complete the requirements for the M.D. degree. Both degrees are awarded at the completion of the sequence. Minor variations in this schedule can be arranged if this is advantageous to the student's education.

*Year 1—Core Basic Science Year.* This year consists of three basic science courses: Molecules and Cells, Normal Body, and Body and Disease, please refer to M. D. requirements.

*Year 2—Core Clinical Science Year.* The second year consists of an Orientation to the Clinical Year (OCY), six core clerkship rotations, five Intersessions, three elective periods, the Practice course, and a final week for assessment. The goals of the core clerkships include developing students' skills in accurate patient-based problem-solving and appropriate use of resources to diagnose and treat patients.

The **core clerkship** rotations include:

- Medicine (8 weeks)
- Surgery (8 weeks)
- Obstetrics and Gynecology (6 weeks)
- Pediatrics (6 weeks)
- Family Medicine (4 weeks)
- Psychiatry (4 weeks)
- Practice (4 hours every other week for entire year) – Advanced clinical themes (ethics, professionalism, end-of-life, etc.)

Five one-week **Intersessions** occur between clerkship rotations. Each week has an interdisciplinary theme (i.e., Patient Safety, Aging, Critical Care, Oncology, and Disaster Preparedness).

*Years 3, 4, 5, (6)—The Graduate Years.* During the third, fourth, fifth and, if necessary, sixth year of the program, the trainee pursues graduate study to satisfy the requirements for the Ph.D. degree. These requirements include: (1) completion of necessary course work, (2) adequate performance in the preliminary examination, (3) original research suitable for a dissertation, and (4) successful defense of the thesis in the final examination. Detailed descriptions of the other general requirements for the Ph.D. degree are stated in the *Bulletin of the Graduate School.*

The graduate curriculum of each trainee is developed in consultation with the director of graduate studies of the department in which the trainee elects to study and requires the approval of the Medical Scientist Training Program Committee. Since most of the ordering ideas and experimental techniques of all the medical sciences derive from mathematics and the physical sciences, it is essential to ensure that all students in the program have an adequate foundation in these subjects. Because of the close working relationship and geographical proximity of the departments of medical and physical sciences at Duke, the setting is unusually favorable for the achievement of that goal.

Descriptions of the graduate courses in the Departments of Biochemistry, Cell Biology, Genetics and Microbiology, Immunology, Neurobiology, Pathology, Pharmacology and Cancer Biology, Biomedical Engineering, Chemistry, and Zoology are listed in the *Bulletin of the Graduate School.* Trainees are encouraged to select courses which relate to their developing individual interests rather than follow a prescribed curriculum applied to all students in a given discipline. Such range, flexibility, and freedom are the essence of graduate education. The original research and dissertation of each trainee is supervised by a faculty adviser chosen by the trainee in consultation with the director of graduate studies in the appropriate department. The faculty adviser is the chairman of the trainee's supervisory committee, which consists of at least three members from the major department. This committee generally administers the preliminary examination before the student commences original research and the final examination after the student completes the dissertation.

*Final Year—An Elective Year in Clinical Science.* In this year, which is entered only after completion of all requirements for the Ph.D. degree, the student and her or his Medical School advisory dean construct an individualized curriculum which often places major emphasis on one clinical area and minor emphasis on other fields. One aim is to integrate research interests and clinical experience in such a way that the student's research competence is facilitated; therefore, the year is planned with regard to the trainee's proposed career in research as well. This elective year provides further training in clinical medicine to complement the second (core) clinical year, so that the trainee's total clinical experience is the same as that given in the regular clinical years of medical school (the third and fourth years in the majority of schools). It should be noted that since students in the program receive the M.D. degree upon completion of the final year, great care is taken by the faculty to ensure that students are competent and knowledgeable in current concepts of patient care. It is hoped that the final year provides the student with an experience which is not repeated during the residency but serves to complement later phases of training. For example, future surgeons might be exposed to fields other than surgery, since they receive intensive training in that discipline during their residency programs. For more information on fourth year course requirements, please refer to page 7.

*Application and Admission Procedures.* The following guidelines should be observed by individuals applying to the Medical Scientist Training Program.

1. The application form for the Duke University School of Medicine should be completed and submitted as early as possible since acceptance into the Medical Scientist Training Program requires acceptance by both the Program Committee and the Medical School Admissions Committee. Applicants who cannot be accepted into the program are still fully eligible for acceptance to the Medical School if the Medical School Admissions Committee considers them qualified and desirable.
2. The application form for the Medical Scientist Training Program should be completed and submitted no later than December 1.
3. To facilitate review of this application, the Medical College Admission Test should be taken, if possible, in April of the year in which the application is submitted.
4. Only those applicants who are accepted for the program are requested to complete an application form for the Graduate School. The Graduate Record Examination is not required for this purpose.
5. Applicants are notified about acceptance into the program on or about February 28.

Additional information may be obtained by writing Salvatore V. Pizzo, M.D., Ph.D., Director, Medical Scientist Training Program, Box 3712, Duke University Medical Center, Durham, North Carolina 27710 **or** by checking our website at *www.mstp.duke.edu* **or** emailing *mille168@mc.duke.edu.*

**Primary Care Program.** In September of 1994, Duke University School of Medicine instituted the Primary Care Program for medical students. The goal of the program is to develop leaders in primary care disciplines of medicine. Any student matriculating in the Medical School and expressing an interest in becoming a primary care physician can apply to join this program. The program functions much as an academic society, with periodic informal meetings of generalist faculty and program students. During third year, Primary Care Program students are encouraged to participate in either the Clinical Research Study Program or the Epidemiology and Public Health Study Program during the third year. These study programs provide an opportunity for dual degrees, such as M.D. /M.B.A., M.D. /M.H.S., M.D. /M.P.P., or M.D./M.P.H. During the fourth year, students are encouraged to take a generalist subinternship, and at least one ambulatory care rotation in a generalist discipline such as community medicine or geriatric medicine. Throughout the four years, students are assigned a primary care mentor as well as an advisory dean. Students may join the program at any time during the first three years and may withdraw from the program at any time. Participation also does not necessitate a primary care career choice. The program is jointly sponsored by the Departments of Community and Family Medicine, Medicine, Obstetrics/Gynecology, and Pediatrics. Additional information may be obtained by contacting Barbara Sheline, M.D., M.P.H., Box 3886, Duke University Medical Center, Durham, NC 27710, *sheli002@mc.duke.edu.*

**The Clinical Research Training Program (CRTP).** This five-year combined degree program is offered to meet the increasing demand for physicians trained as clinical researchers. Upon completion of the program, students are awarded the Master of Health Sciences in Clinical Research degree as well as the M.D. degree. Through the Clinical Research Training Program, this curriculum offers courses in clinical research design, research management, and statistical analysis as well as a mentored clinical research experience. The program is offered by the faculty of the Department of Biostatistics and Bioinformatics with the participation of other members of the Medical Center faculty who have expertise in relevant areas.

*Course of study.* Students interested in the M.D./M.H.S. program enroll in the normal course of study in the School of Medicine during the first two years and in the Clinical Research Training Program during the third and fourth years. The fifth and final year is spent completing the elective clinical science work that is tailored to the student's specialized needs.

*Tuition.* Students registering for this program are assessed the usual tuition and fees. The Medical School registrar's office then reimburses the CRT Program for tuition and mandatory fees for participating students for a maximum period of one calendar year. Students who continue to enroll in courses in the CRTP after the expiration of one calendar year must request a leave of absence from the School of Medicine. During this period, such students are billed directly by the CRTP at the program's regular

tuition rates and are responsible for making payment. Financial aid is available.

*Application procedure.* The Clinical Research Training Program and the Clinical Research Study Program offered to third year students through the Medical School are two distinct programs. Medical students interested in pursuing the M.H.S. degree through the Clinical Research Training Program should contact the Program Director, Eugene Z. Oddone, M.D. *(oddon001@mc.duke.edu)* to discuss their interests.

**Master of Arts in Clinical Psychology – (approved June 2005).** After successful completion of the first two years in the School of Medicine at Duke, students may apply for a Masters in Clinical Psychology. Interested applicants must be second year medical school students with a demonstrated aptitude and established interest in Behavioral Medicine. Students enrolled in this program must complete a minimum of 30 credits which must include 24 credits of graded courses. This must be approved by the Psychology department and School of Medicine mentors and school administrators. The work will be reported in a document that will serve as a third year Thesis for the School of Medicine and Area Paper for the Department of Psychology. Students will be required to defend their Paper to a committee comprised of three members, which will include at least one individual from the School of Medicine and from the Department of Psychology. The members will be chosen by the Program Administrators. Students are required to meet all requirements of the Duke School of Medicine third year curriculum (e.g., completion of IRB modules).

*Applications*: All applications must be submitted to the Department of Psychology during the second year of medical school by December 1 (the year prior to beginning the program). Letter of intent recommended to be submitted by September 1.

*Tuition*: Students will be required to pay one year tuition to the Graduate school as well as their

## Master of Arts in Liberal Studies – MD/MALS

This joint degree option would begin in the 3rd year of a student's medical degree. It would be a two-year program in its first implementation. Options for creating a one-year program to be situated in the 3rd year of medical school will be explored after the initial implementation.

The foundation of the MALS program is the idea that liberal learning is central to an individual's continuing intellectual growth and capacity for critical thought. Because this sort of learning does not stop at the boundaries of a particular academic discipline, the MALS program offers a wide range of courses not available in traditional graduate programs. Using an interdisciplinary approach, students can explore diverse subjects and apply fresh perspectives from a variety of fields. The structure of the program is flexible enough to meet personal and professional goals.

The objectives of a MALS degree are to extend a student's intellectual resources and range, to promote openness to new ideas and appreciation of differences, to stimulate students to find connections between their studies and their professional lives, and to encourage a lifelong commitment to learning, free inquiry and the life of the mind.

Apply to the MALS program on-line through the Graduate School; application deadline for fall is May 15th. All MD/MALS theses proposals also will require School of Medicine approval. For more information, please contact Donna Zapf, Ph.D., Director, Box 90095, 919-684-3222, *dzapf@duke.edu;* OR Kathryn M. Andolsek, M.D., MPH; DUMC 3915, Durham, NC 27710; (919) 668-3883; a*ndol001@mc.duke.edu*

## Master of Science of Library Science and Information Science–MD/MSLS or MD/MSIS

The proposed dual degree program allows students interested in information management, information technology, and the development of evidence-based resources to further explore the role of information in the clinical setting. Through the dual-degree program, students are able to integrate their clinical knowledge with the information skills and concepts found in the library and information sciences curricula. In the future these medical informationists will be able to contribute to the development, selection, and delivery of high quality information that is relevant to the clinical setting and patient care.

### How long does it take?

Two years for MSLS or MSIS. Coursework for the program may be completed in less time (3 semesters and summer courses), but the expectation is that the students will complete the program and their research project within two years and will return to their fourth year medical school program by August, two years after starting their MSLS or MSIS.

The medical students will apply for acceptance to the UNC School of Information and Library Sciences (SILS), and the UNC Graduate School, and if admitted will pursue the MSLS or MSIS degree over the next two years. Students will be expected to fully meet the SILS criteria for earning a degree in library science and information science.

The medical students will be also expected to follow the School of Medicine's registration procedures for the scholarly years and meet all criteria required by the Third Year Committee, including the submission of a thesis that meets Duke's requirements.

*Applications.* Students will follow the existing registration procedures at both schools. Students must register with Duke University School of Medicine for their third-year experience. In addition they must follow UNC SILS' registration process for enrolling in their masters courses.

The UNC Graduate School recommends **submission of all materials by December 1**, due to the volume of applications received.

*UNC SILS recommends early submission due to the limited number of spaces in the program.*

### Required deadline dates for the fall semester are:

- To be considered for Graduate School financial assistance (all applicants) - Jan. 1
- To be considered for SILS financial aid - Feb. 15
- Financial assistance not requested - June 15
- Duke medical school registrar should be notified that an application to this program has been submitted to UNC.

Early submission of application materials will enhance consideration for the limited number of spaces available in the program.

Students will be responsible for payment of Duke University School of Medicine tuition for the first year of the program and UNC tuition for the second year (while on leave of absence from Duke).

For more information, see *http://www.mclibrary.duke.edu/about/dualdegree* or contact Patricia L. Thibodeau, MLS, MBA, Associate Dean for Library Services & Archives, DUMC 3702, Durham NC 27710; 919 660-1150; *thibo001@mc.duke.edu;* or Peggy Schaeffer, Project Coordinator, UNC-Duke Medical Information Specialist Training (UNC-Duke MIST), School of Information and Library Science, *peggy.schaeffer@unc.edu* 919-660-1197.

**The Medical Historian Program.** The Medical Historian Program is conducted under the auspices of the School of Medicine and the Graduate School. Individuals earning the Ph.D. degree in history from Duke may petition the vice-dean to receive transfer credit that can be applied to the medical school degree if the major subject area is one that is related to the discipline of medicine, health policy, or public health. The combined M.D./Ph.D. program typically extends for six years. Students complete the first two academic years in the School of Medicine (the required, core basic and clinical courses) prior to taking a leave of absence to enroll in the Graduate School. A range of appropriate courses is available there through the Department of History. Following the completion of the Ph.D. degree, the student resumes requirements for the M.D. degree.

*Application and Admissions Procedures.* Applicants must meet the requirements for admission to the School of Medicine and the Graduate School in the Department of History. Candidates who have completed two years of medical school are also considered. In addition to the minimum requirements established by the School of Medicine and the Graduate School, courses in history and in the history and philosophy of science count in the selection of candidates.

Applicants should complete and submit an application form to the Duke University School of Medicine and to the Graduate School for admission to the Department of History.

Further information may be obtained by contacting Margaret Humphreys, M.D., Ph.D., Box 90719, Department of History, Duke University, Durham, NC 27708, *meh@duke.edu.*

**Medicine and Business Administration Program.** The Duke School of Medicine and The Fuqua School of Business jointly sponsor a program of medical and business administration education. Upon satisfactory completion of the required course of study, candidates are awarded both the M.D. and the M.B.A. degrees.

*Course of Study.* The student in the M.D./M.B.A. program begins the program in the School of Medicine. As in the regular M.D. program, the first year is devoted to the basic medical sciences and the second year to the basic clinical disciplines.

Upon successful completion of the second year, the student takes a leave of absence from the Medical School and enters The Fuqua School of Business where the first-year core course curriculum is the same as that of other M.B.A. students in The Fuqua Health Sector Management Program.

Upon completing the first year M.B.A. curriculum, the student returns (typically in May of their third year) to the School of Medicine to begin the first half of a 12-month scholarly experience required to fulfill the Duke Medical School third year requirement. The third year study track director of the Epidemiology and Public Health Study Program works with the students to ensure identification of an appropriate mentor and topic and thesis submission in a timely manner.

In the fall of that year (the beginning of the fourth year of the combined program), the student continues enrollment in the School of Medicine but also returns to the School of Business to complete elective course work. During the spring of this fourth year, the student completes the second half of the scholarly activity period. The student's quantitative thesis is due at the end of this fourth year and prior to the student enrolling in the fifth and final year. In addition to this quantitative thesis, the student is required to

-complete all required Duke School of Medicine third year components (currently 5 research ethics internet modules and a statistics module).

-make an oral presentation to AOA day or some comparable group on their research topic.

*Eligibility.* Applicants for the M.D./M.B.A. program must qualify for admission to both the School of Medicine and The Fuqua School of Business. The usual approach is to apply to The Fuqua School of Business during the second year of Medical School. It is helpful, however, for a student to indicate upon admission to the School of Medicine that he/she has an interest in the joint degree program of the School of Medicine and The Fuqua School of Business. Neither school gives preference to joint degree candidates in the admission process.

*Application Procedures.* Applications for The Fuqua School of Business must be completed online from Fuqua's Admissions website: *www.fuqua.duke.edu/admin/daymba/admissions/appdown.html.* Applications for the School of Medicine must be made by utilizing the AMCAS procedure described in this Bulletin.

*Financial Aid.* During the four years that students are enrolled in the School of Medicine, they are eligible for financial aid from the School of Medicine. During the year students are on leave of absence from the School of Medicine and enrolled in The Fuqua School of Business, they are eligible for loans and grants through the School of Business only.

For additional information, contact the M.D./M.B.A. Program advisor, Dr. Kevin Schulman, Director, Center for Clinical and Genetic Economics, Duke Clinical Research Institute, DUMC, Box 17969, Durham, NC 27715, *schul012@mc.duke.edu* or Nichole Berke, The Fuqua School of Business, Assistant Director of the Health Sector Management Program, Box 90120, Duke University, Durham, NC 27708, *nbrke@mail.duke.edu,* and students must contact David B. Matchar, M.D.; Box 3896 Med Center, Durham, North Carolina 27710, (919) 286-3399, *david.matchar@duke.edu.*

**The Medicine and Juris Doctor Program.** The School of Medicine and the School of Law of Duke University jointly sponsor a highly selective program of combined medical and legal education. The program provides an opportunity to acquire a full basic study of the two fields. Upon satisfactory completion of the required course of study, candidates are awarded both the M.D. and the J.D. degrees.

*Course of Study.* The student in the M.D./J.D. Program generally begins her or his course of study in the School of Medicine. As in the regular M.D. Program, the first year is devoted to the basic medical sciences and the second year to the core clinical disciplines. The completion of the first two years al-

lows the individual to integrate the classroom with the clinical experience of patient care. At the time the Medical School curriculum starts a third year of research experience, the student enters the School of Law where the first-year curriculum is the same as that of other law students. During the next two years, the student takes electives in the law curriculum, including available health law courses. In addition, some students pursue legal clerkships during the two summers to gain experience in health care law or related areas. A total of 74 credits must be earned in the Law School. The final time is spent in the Medical School completing elective and required clinical science work that is tailored to the student's specialized needs and interests. Students are also required to write a quantitative thesis after their research year. In collaboration with the study track directors, students must also

-select a research mentor,

-write and submit a quantitative thesis after their research year as well;

-make an oral presentation on their research at AOA day or comparable forum;

-fulfill the other requirements of the Duke University School of Medicine (currently 5 internet modules on research ethics, statistics module)

The thesis and the other third year requirements must be completed prior to starting the 4th and final year in the School of Medicine.

*Eligibility.* Applicants for the M.D./J.D. Program must qualify for admission to both the School of Medicine and the School of Law. The usual approach is to apply for both schools simultaneously, thus reserving a place in the program prior to arrival. Applications are also accepted from members of the first and second year medical school class for admission to the School of Law and from the second year law school class for admission to the School of Medicine. Applicants should complete applications to each school separately. Neither school gives preference to joint degree candidates in the admissions process.

*Tuition:* Students in the M.D./J.D. Program are required to complete the entire Medical School curriculum, but are permitted to arrange their schedules such that third year requirements may be satisfied during a continuous period of enrollment. Tuition for the required, basic science "year" is assessed twice for these students during the first two semesters of a minimum enrollment of five credits of third year work in the Medical School.

*Application Procedure.* Application forms for the School of Law may be obtained by writing to the Office of Admissions, Duke University School of Law, Box 90393, Durham, North Carolina 27706. Applications for the School of Medicine shall be made by utilizing the AMCAS procedure described in this bulletin.

*Deadlines.* For those seeking simultaneous admission to both schools: at the end of the junior year students take the Medical College Admissions Test (MCAT) and the Law School Aptitude Test (LSAT).

For admission to the Medical School, the AMCAS application procedures should be completed. Upon receipt of the supplemental application form from Duke, the box indicating M.D./J.D. Program should be checked. The deadline for the AMCAS procedure is November 1. There is no deadline for the Law School, but January 15 or earlier submission is suggested.

For additional information, contact the M.D./J.D. advisor, Paul Lee, M.D., J.D., Box 3802, Duke University Medical Center, Durham, North Carolina 27710, *lee00106@mc.duke.edu,* (919) 681-2793 and students must contact David B. Matchar, M.D.; Box 3896 Med Center, Durham, North Carolina 27710, (919) 286-3399, *david.matchar@duke.edu* regarding their 3rd year research thesis.

You may find it most helpful to schedule a phone conversation to discuss your interests and the appropriateness of this program at this number.

**The Medicine and Public Health Program.** Students enrolled in the School of Medicine, after satisfactory completion of the first two years of the regular curriculum, may request approval to seek a Master of Public Health degree at the University of North Carolina- Chapel Hill. Currently Duke pre-approved Programs are to train physicians are

- Health leadership and prevention
- epidemiology

- maternal and child health
- nutrition.

At the end of the students' third year, they are required to submit a quantitative thesis and present their findings at a suitable venue. . Upon receipt of the M.P.H. degree and completion of a quantitative thesis, students are awarded a full year of basic science credit toward the M.D. degree.

Students should consult the UNC School of Public Health for information on eligibility, application requirements and deadlines, and course requirements of the degree. Most students are successful in obtaining this degree but it takes a great deal of organization, coordination, and proactive effort.

**Tuition:** Effective for the 2004-2005 academic year, Duke will pay for a maximum of 9 tuitions at the "in-state" tuition rate. Eligible students are those Duke students accepted into the UNC MPH School of Public Health in one of the 4 study tracks currently approved by the Third Year Committee (Epidemiology, Maternal and Child Health, Health Leadership and Prevention and Nutrition).

The amount budgeted each year for tuition will be based on the UNC tuition rate for nine students **assuming two full-time semesters and one three-quarter time semester (this is the maximum costs which will be covered by Duke).** Any tuition costs associated with additional time necessary are the sole responsibility of the student. UNC has recently increased its course requirements and this may be challenging to complete within the three semesters of funding for some students and some tracks. Please review degree requirements and choose carefully.

Students are interested in this funding will be invited to submit a competitive application to have their tuition covered. If more than 9 request funding, The Director of the EPH Study Program will convene an Advisory group to review the applications and to select students who will be offered the tuition benefit. The other students will be rank ordered on a "Wait list" should one or more in the first 9 not be admitted to UNC or change their plans.

Students who are not selected for this tuition award may still pursue the MPH at UNC but they will be responsible for the full costs. In addition students who wish to pursue an MPH *not* at UNC are able to bring the request for this third year opportunity to the third year curriculum committee, but they are not eligible for the Duke tuition benefit. *This policy is subject to change.*

For additional information on the M.P.H. program, contact the Director of the M.D./M.P.H. Program, Kathryn Andolsek, M.D., MPH; Associate Director Graduate Medical Education; DUMC Box 3190, Room M139, Green Zone, Davison, Durham, North Carolina 27710, (919) 668-3883, *kathryn.andolsek@duke.edu* or fax *919-684-8565. Reviewed March 2006*

**The Medicine and Public Policy Program.** This program is offered to meet the growing demand for persons who combine medical skills with a capacity for analytic public decision-making. It aims at training those persons with the requisite talent to be leaders in the development and implementation of health policy at all levels of government.

Utilizing the faculty and resources of the School of Medicine and the Terry Sanford Institute of Public Policy, the program offers students a multidisciplinary education that provides:

1. A complete course of study in the basic medical sciences and clinical training in the practice of medicine identical in scope and rigor with the education received by students enrolled in the Doctor of Medicine program alone;
2. Familiarity with the organization and financing of health services, with particular focus on the economics and politics of health care;
3. An understanding of the political, bureaucratic, and social processes that define public problems and limit alternative approaches to their solutions;
4. A capacity for quantitative and logical methods of analysis useful in forecasting and appraising policy consequences and in evaluating existing policies;
5. An understanding of the uses and limitations of various analytic techniques and an awareness of the value considerations and ethical choices implicit in particular policy alternatives.

After the first two years in the School of Medicine at Duke, course work shifts to the Public Policy Institute in the third year. In addition to the normal public policy curriculum, combined degree students are required to complete an epidemiology course. Between the third and fourth years, students com-

plete a 12-week policy internship in the summer. Before the fourth year, students complete a quantitative thesis to fulfill Medical School requirements, then go on to their fourth year. When they have completed all the requirements for the two programs, both the M.D. and Master of Public Policy (M.P.P.) degrees are awarded.

*Tuition:* Students take a leave of absence from the School of Medicine to enroll in Duke's Graduate School for the M.P.P. Upon award of the M.P.P. degree, students are granted 32 transfer credits for fulfillment of third year M.D. program requirements. The corresponding two tuition payments for the third year are waived. Students who elect to complete the traditional third year in addition to the M.P.P. must pay the Medical School for four years of tuition and do not earn transfer credit for work completed in the alternate program.

*Admissions.* Students may apply for admission to the program during their first or second years.

*Applications.* Requests for applications and specific questions about the program should be addressed to the Director of Graduate Studies, Terry Sanford Institute of Public Policy, Box 90243, Duke University, Durham, North Carolina 27708-0243, *mpp@pps.duke.edu.* Inquiries and Medical School approval can be obtained from the Director of the M.D./M.P.P. Program, David B. Matchar, M.D.; Box 3896 Med Center, Durham, North Carolina 27710, (919) 286-3399, *david.matchar@duke.edu.* Students approved to study away for the M.P.P. degree, please refer to the Study Away policy.

# Financial Information

## TUITION AND FEES

**Tuition Policy Statement.** The Duke University School of Medicine's mission in medical education is to build upon our internationally-recognized tradition of excellence in training outstanding practitioners and physician-scientists who will be leaders in all fields of medicine. By selecting outstanding and dedicated students for matriculation, the school is committed to preparing physicians to respond to societal health needs. The School of Medicine has a policy of need-blind admission and adequate financial aid for those students with financial need. Tuition is set at a level that is competitive with schools of comparable quality and selectivity for admission. This tuition policy, plus a financial aid program which protects against excessive student indebtedness, permits the School of Medicine to attract the most qualified students nationally and regionally, regardless of the student applicant's personal or family financial status. It is important that tuition and financial aid are balanced to ensure that debt does not skew career choices of medical students once they graduate from the Medical School.

**Tuition.** The following table represents an estimate of a student's necessary expenses in the School of Medicine. The total of these figures suggests a basic minimum budget of approximately $53,400 for a fourth year student to $61,800 for a first year student. These are estimated figures only. Tuition and fees are subject to change without notice.

### 2006-07 Cost of Education

| | |
|---|---|
| Tuition- | $ 36,880 |
| Accident and sickness insurance* (subject to change) | $1,589 |
| Technology fee | $1,850 |
| First year fees† (includes microscope rental, first year only) | $ 994 |
| Annual cost of books and supplies: first year | $2,605 |
| Annual cost of books and supplies: second year | $1,764 |
| Annual cost of books and supplies: third and fourth years | $782 |
| Rent, board, and miscellaneous: first and third years (12 mos.) | $17,340 |
| Rent, board, and miscellaneous: second year (13 mos.) | $20,085 |
| Rent, board, and miscellaneous: fourth year (12 mos.) | $12,360 |
| Continuing/Education Research Study Fee‡ (per semester)- | $35 |
| Motor vehicle registration: car | $600 |

* Mandatory fees.

† Sphygmomanometer, ophthalmoscope, otoscope, and other equipment required of each student must conform to rigid standards.

All individuals registered in the Duke University School of Medicine as M.D. degree candidates are considered to be full-time students if they are registered for a minimum of five credits each semester. Each student determines the number and types of courses taken with their advisory dean and, when applicable, one or more of the appropriate committees.

Tuition and fees are payable on a semester basis. Students are required to pay full tuition for four years as a requirement for graduation. Tuition rates are determined according to matriculation date and increase yearly at a rate determined by the School of Medicine Financial and Resource Planning Office and approved by the Board of Trustees. Students are charged for no more than the equivalent of four full years of tuition. A student who fulfills the tuition payment obligation but has not completed requirements by the end of the last payment period is not assessed additional tuition during any subsequent terms of enrollment.

**Remediating Students.** Students who are not registered for courses but are completing required remedial work as determined by the appropriate promotions committees are considered to have full-time status. They are not assessed tuition charges and are eligible only for Duke loan to assist in meeting cost of living expenses.

**Advanced Standing Matriculants.** Students who enter the M.D. degree program with previously earned doctorate degrees may petition the Third Year Committee and vice-dean to receive a maximum of 36 elective, basic science credits to be applied to the third year M.D. curriculum. Students granted 16 transfer credits are given allowance for one tuition payment. Those granted 36 transfer credits are given allowance for two tuition payments. Advanced standing students who elect to register at Duke for the curricula for which they could have received transfer credit, forego the appropriate tuition waivers and are assessed tuition accordingly.

**Transfer Students.** Only in extraordinary circumstances are transfer students accepted into the Duke program. However, in these instances, such a student must have completed successfully two years of course work in the basic sciences to be eligible to apply. Upon entrance to the Duke M.D. program, transfer students receive credit for the first and third year curricula, and the corresponding four tuition payments are waived.

**Dual Degree Students.** Because of differing curricula and structures of the master's programs, tuition payment requirements vary according to the program in which a student participates. Please see the previous descriptions of dual degree programs in this Bulletin for tuition guidelines specific to each program.

**Payment of Accounts.** Statements for tuition, fees, and other charges are mailed by the bursar's office on a regular basis. These statements are also available on-line on the ACES website. Payment is due in full by the due date listed on the statement. You may make your payment by e-check on the ACES website or mail your payment using the remittance envelope sent with your bill. As a part of the agreement of admission to Duke University, a student is required to pay all statements as presented. If full payment is not received by the statement due date, a late payment charge as described below is assessed on the next statement, and certain restrictions as stated below will be applied. Failure to receive a statement does not warrant exemption from the payment of tuition and fees nor from the penalties and restrictions. Non-registered students will be required to make payment at the time of registration for tuition and fees and any past due balance on the account.

*Late Registration Fee*. Failure to register during the prescribed registration periods offered by the School of Medicine will result in a $100 fee. Any student who begins registration during the Drop/Add period of registration will be assessed this fee.

*Monthly Payment Option.* The Monthly Payment Option Plan allows students and their parents to pay all or part of the academic year's expenses in ten equal monthly payments from July 1 to April 1. The only cost is an annual, nonrefundable fee of $95. Visa or MasterCard can pay the participation fee.

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‡ The School of Medicine encourages students to interrupt their studies to pursue approved research that is complementary to the medical curriculum at Duke or elsewhere for no credit. To retain full-time student status for loan deferment purposes, students may seek approval to enroll in the Continuation of Research Study option. Only students eligible to be enrolled at Duke during the applicable time period may participate.

Payments may be made by check or by bank draft. Questions regarding this plan should be directed to Tuition Management Services, 1-800-722-4867. At renewal, the plan can be extended to 12 months. The monthly payments can be increased or decreased without additional cost.

*Late Payment Charge.* If the "Total Amount Due" on a statement is not received by the statement due date, the next statement will show a penalty charge.

*Restrictions.* An individual is in default if the total amount due is not paid in full by the due date. A student in default is not allowed to register for classes, receive a transcript of academic records, have academic credits certified, be granted a leave of absence, or receive a diploma at graduation. In addition, an individual in default may be subject to withdrawal from school and have the account referred to a collection agency or credit bureau.

No credit is given for any term in which the tuition has not been paid, whether the work has been at Duke or elsewhere. It is not advisable for students to attempt outside work to defray their expenses during the academic year. Spouses of medical students desiring employment may secure information from the Office of Duke University Human Resources.

**Refunds of Tuition and Fees.** Tuition and fees refunds are governed by the following policy:

1. In the event of death a full refund of tuition and fees is granted.
2. Students who withdraw from the Medical School or are approved to take an official leave of absence before the end of the first week of classes (as determined by the calendar corresponding to the student's curriculum) receive a full refund of tuition.
3. Students who withdraw or take leaves of absence after the first week of classes of their particular curricula receive no refund of tuition. However, if a student returns to the School of Medicine, that tuition payment is included in the total number required by the school.

Because Duke University participates in Title IV federal aid programs, it follows federal guidelines with respect to the refund and repayment of Title IV funds. Students will have their Title IV financial aid adjusted according to the federal regulations. Additional information regarding this procedure may be obtained from the Office of Financial Aid.

**Continuation of Research Study/Educational Research Study Option Fee.** The School of Medicine encourages students to interrupt their studies to pursue approved research that is complementary to the medical curriculum either at Duke or elsewhere for no credit. Full-time student status can be retained for a maximum period of two years during these periods of study if approval is obtained from the appropriate officials and the student registers for and pays an enrollment fee of $50 for each semester or part of a semester away. No refund of any portion of the fee is allowed for students who subsequently withdraw from the School of Medicine. Students are not eligible for financial aid during this period.

Students enrolled in another institution for the purpose of obtaining a dual degree do not qualify for CRS/ERS status, but must take a leave of absence until they return to the Duke School of Medicine. (M.P.H. students, please refer to the previous M.P.H. section in this bulletin.)

Although considered to be full-time by the Duke School of Medicine, financial aid recipients should be aware that all lenders for loan deferment purposes may not recognize such status.

Only students eligible to be enrolled at Duke during the applicable time period may participate in this option.

## FINANCIAL AID PROGRAM

The Duke University School of Medicine makes financial assistance available to accepted students who due to economic circumstances could not otherwise attend the university. The School of Medicine is committed to meeting the demonstrated financial need of applicants based upon federal and institutional policies and procedures. In a recent academic year, approximately 82% of the total student enrollment received financial assistance from sources other than parents. Grants, scholarships and loans from all sources to medical students totaled over $14 million. Over $6.5 million of these funds were from Duke University School of Medicine sources of which over $4.5 million were in scholarships/grants. Financial assistance is available in a combined form of grants and loans, and all awards are made on the basis of demonstrated need to eligible U.S. citizens.

**Financial Assistance to Incoming First-Year Students.** Students should start the financial aid application process as soon as possible after January 1. Students are given information about this process at the time of their interview, and all students, regardless of their interest in financial aid, are sent information at the time of their acceptance. The economic circumstance of the applicant has no bearing on whether the applicant is accepted into the medical school.

The applicant requesting financial aid is expected to work during the summer preceding entrance into medical school and to save part of those earnings to defray a portion of the first-year expenses.

The applicant's need is determined before an award is made. The Office of Financial Aid therefore requires the *Need Access* and the *Free Application for Federal Student Aid (FAFSA)*. Copies of federal income tax returns with all supplemental schedules and W2s for both parent(s) and student are also required as part of the financial aid application. An official aid award notice is mailed to the accepted applicant after receipt of the required forms.

**Financial Assistance to Upper-class Students.** Annual reapplication is required of all need-based aid recipients. Typically, May 1 prior to the award year is the filing deadline.

**Financial Aid When Studying Away.** Need-based financial aid is available during fourth year clinical elective years. A student receiving a research scholarship may also qualify for need-based financial aid funds. External scholarships are used to replace the need-based portion of the loan package first.

Your new award will incorporate any research scholarship within your financial aid award in accordance with NIH, Duke SOM policies and federal financial aid regulations. Duke University School of Medicine policy dictates that all external scholarships replace need-based loans first. At such time that these loans are replaced, the grant portion of your aid award will be reduced. This includes any merit scholarships as well. Total aid from all sources cannot exceed the established and board approved cost of education. Whenever aid exceeds cost, there is an over-award situation which is a violation of federal regulations (HEA section 673.5 (b) (2), 673.5 (d)). All effort has been made to ensure that you have all the financial aid to which you are entitled.

Need-based financial aid funds are not available for the added monthly cost at Study Away sites where cost is greater than if the student studies at Duke. Unsubsidized loans can be obtained for these additional expenses. Students are reminded that their refunds include any additional living allowances that may have been added to their budget. Every effort will be made to map refunds to expenses but students are expected to track their own spending habits to scheduled refunds.

External scholarship awards are typically disbursed in August and early January; however, students will want to verify with their scholarship source the actual disbursement calendar and make financial arrangements accordingly. The funds credited to the student account first go to pay any outstanding tuition or fees on the account. Any remaining balance will be refunded to the student. In the case of the Howard Hughes award, the research allowance is allocated to the individual lab and mentors through the Duke University Accounting system. They have fiscal responsibility for these funds, not the Financial Aid Office.

For additional information, please contact the Office of Financial Aid at 919-684-6649 or email at *financial_aid@mc.duke.edu*.

## Need Based Aid

**Grants.** The School of Medicine is pleased to be able to offer grants to those students who qualify for need-based aid. The school recognizes, however, the responsibility of the individual and the family to provide funds to achieve the objective of a medical education. Thus, the school does not consider parents to have discharged the full financial obligation for the continuing education of their sons or daughters upon the latter's completion of the undergraduate degree. When being considered for a Duke grant, it is the responsibility of the student to provide all parental information to the Financial Aid office. This information is in the form of parents' tax returns/W2s from the most recent tax year and the Need Access, which the student fills out and submits either on-line or through the mail. It is important that the student submit their financial aid application as soon as possible in order to receive a financial aid notification prior to May 15th. It is Duke's policy to calculate and assess each family a parental contribution each year. By accepting the award, you understand that this assessment will take place each

year of your medical education. Situations may change for students during medical school: marriage, birth of children, etc., but parental information is still required to be submitted for students to be considered for Duke need-based grants. Additional information is available at the financial aid website: *http:// finaid.mc.duke.edu.*

It is the responsibility of recipients of financial aid to keep the Medical Center Office of Financial Aid informed of any outside financial assistance they may receive. It must be understood that the school reserves the right to reconsider its offer of financial assistance in the event of a major outside award to a recipient. No financial aid funds may be used during a period when the recipient is not involved with academic work toward the medical degree. Less than half-time or special students are not eligible for financial aid.

# Loans

**Federal Stafford Student Loans.** The Federal Stafford Student Loan is available to eligible students. For purposes of Federal Stafford Loans and other Title IV funds, graduate and professional students are financially independent of parents. The annual maximums for medical students are $8,500 subsidized and $30,000 unsubsidized. The interest is paid by the federal government on the subsidized Federal Stafford Loan until repayment begins six months after graduation. On the unsubsidized Federal Stafford Loan, the borrower is responsible for the interest that may be paid or deferred during the enrollment period. Eligibility for the subsidized and unsubsidized Federal Stafford Loan is determined by the financial aid office based on the Student Aid Report as a result of filing the FAFSA. For new loans disbursed after July 1, 2006, a fixed interest rate of 6.8% prevails for previous loans, a variable rate cupped at 8.25% will exist. Duke University School of Medicine reserves the right to decline loan applications for those applicants who do not have a satisfactory credit history. U.S. citizenship or permanent residence visa is required of all students receiving loans through the school.

**The North Carolina Student Loan Program for Health, Science, and Mathematics**. These loans provide financial assistance to North Carolina residents who demonstrate need as determined by the North Carolina State Education Assistance Authority. Loans are available for study in the medical fields, mathematics, and science programs that lead to a degree. The applicant must be a domiciliary of North Carolina and accepted as a full-time student in an accredited associate, baccalaureate, master's, or doctoral program leading to a degree. Loan recipients in some professional or allied health programs may cancel their loans through approved service in shortage areas, public institutions, or private practice. Medical students may receive up to $8,500 per year for each of the four years; master's degree students are eligible for two loans of up to $6,500 each; bachelor's degree students are eligible for three loans of up to $5,000 each. For application forms and more information, write: Executive Secretary, North Carolina Student Loan Program for Health, Science, and Mathematics, P.O. Box 14223, Research Triangle Park, North Carolina 27709-4223, or telephone (919) 549-8614.

**Primary Care Loan (PCL).** Recipients must agree to enter and complete a residency training program in primary health care not later than four years after the date on which the student graduates from the school, and must practice in such care through the date on which the loan is repaid in full.

If the borrower fails to complete a primary health care residency and to practice in a primary health care field, the loan balance is recomputed from the date of issuance at an interest rate of 12 percent per year, compounded annually, instead of five percent. This five percent loan is available on a limited basis for qualified borrowers.

**University loans** are available under the specific restrictions of the loan funds and are awarded on the basis of financial need. Awards are made as part of the regular financial aid cycle. The School of Medicine does have one emergency loan fund; the Francis and Elizabeth Swett Loan Fund is available in small amounts to any medical student on a no-interest basis for a short period of time.

Additional information may be obtained by contacting the Office of Financial Aid, Box 3067, DUMC, Durham, North Carolina 27710, (919) 684-6649 or email: *financial_aid@duke.edu.*

**Federal Scholarships.** Armed Forces (Army, Navy, and Air Force) Scholarship programs may be available for accepted or enrolled students. The recipient receives full tuition, fees, and a monthly stipend in return for a commitment of service as a physician for each year of funding. The special application is made directly to the program in which the student is interested.

### MERIT AWARDS FOR MEDICAL STUDENTS

Duke University School of Medicine has a limited number of merit scholarships. Application and awarding of these scholarships are determined by individual committees. These scholarships are:

*Senior Scholarships* are offered to third year students for use during their fourth year of study. Selection by a special committee is based on outstanding academic achievement and extracurricular activities during the first two and one-half years of medical school. These scholarships, to be paid toward tuition, are in the range of $5,000. These funds support the Senior Scholarship program.

Financial need is not a criterion for selection; however, applicants who feel their financial need is greater than the merit award may apply for financial aid. Students who already have Duke-sponsored, full tuition scholarships are not eligible for funds from this scholarship.

*William G. Anlyan, M.D. Scholarship,* established 1988, by gifts from faculty, staff and friends.

*Barham Endowed Merit Fund,* established November, 1984, by gift from Mr. and Mrs. Joseph Barham, Oak Ridge, Louisiana.

*Family Dollar Scholarship,* established November, 1984, by gift from Mr. Leon Levine, Chairman of the Board, Family Dollar Stores, Inc., Charlotte, North Carolina; for minority students.

*Mary W. and Foster G. McGaw Scholarship,* established February, 1986, by bequest from Foster G. McGaw.

*School of Medicine Merit Fund,* established 1984, by gifts from medical alumni, students, and American Medical Association-Education and Research Foundation.

*The Dean's Tuition Scholarships.* Seven Dean's Tuition Scholarships in the amount of current tuition are given to academically excellent first year under-represented minority students in medicine each year. Preference is given to residents of North Carolina and students must be U.S. citizens. Selection is made by the vice dean based on recommendations from the Medical School Admissions Committee. Annual renewal is contingent upon satisfactory academic progress.

**Federal Scholarships.** Armed Forces (Army, Navy, and Air Force) Scholarship programs may be available for accepted or enrolled students. The recipient receives full tuition, fees, and a monthly stipend in return for a commitment of service as a physician for each year of funding. The special application is made directly to the program in which the student is interested.

## Awards and Prizes

**American Medical Women's Awards.** Glasgow-Rubin Memorial Award presented to a woman who graduated first in her class and Glasgow-Rubin Achievement Citation presented to women who graduate in the top 10 percent of their class, or area considered Honors graduates.

**Andrew C. Puckett Essay Contest.** In honor of Dr. Andrew C. Puckett, Associate Dean Emeritus of the School of Medicine. The topic is chosen each year by Dr. Puckett. The award is chosen by a committee with Dr. Puckett participating in the selection. Prize consists of a Certificate and award for $500.

**Davison Scholarship.** The Davison Scholarship award, consisting of $2,000, is supported by the Davison Club in the memory of Dean Davison to enable a medical student to participate in a clinical science elective outside the United States in an area of primary care. Any student eligible to study away may apply for the award. For consideration for the scholarship, the elective must be approved by the Study Away Committee.

**Dean's Recognition Award.** In recognition of contributions made to the school and the class in leadership and service as well as academic performance, this award is given to 4-6 graduating seniors which consists of a certificate and a monetary award.

**Excellence in Emergency Medicine.** Selected by the faculty in the division of Emergency Medicine to a student who has demonstrated outstanding proficiency in Emergency Medicine. One-year subscription to the Society for Academic Emergency Medicine journal, Academic Emergency Medicine, one-year subscription to *SAEM Newsletter,* one-year complimentary membership in the SAEM.

**E.E. Owen Clinical Scholar Award.** Given by the Watson Clinic Foundation, Inc. in Lakeland, Florida in memory of Dr. Owen who was a Duke Medical School graduate. Selection is made by the

associate deans of Student Affairs, based on excellence in the clinical sciences in the second and fourth years. The award consists of a Certificate and a monetary award.

**Thomas Jefferson Award.** This award, consisting of $100, a certificate, and a book recognizes a graduating senior student who has made outstanding contributions to the university or to fields which have not been traditionally confined to science and medicine. The award is given by the Awards Committee to a graduating senior.

**The Joseph Eldridge Markee Memorial Award in Anatomy.** This award, donated by the friends and family of the late Dr. J.E. Markee, James B. Duke Professor of Anatomy and chairman of the Department of Anatomy from 1943 to 1966, consists of a certificate, medallion, and cash award of $200. It is presented by the Department of Anatomy to the most outstanding student in anatomy during the first year in the Medical School.

**Merck Manual Award.** The latest edition of the *Merck Manual* is given to a graduating senior student based upon overall academic achievement.

**E. Eugene Owen, M.D.** Clinical Awards. Four graduating seniors are selected for a cash award based on excellence in the clinical sciences in the second and fourth years. The Owen Award honors Dr. E. Eugene Owen, a distinguished diagnostician of the Watson Clinic in Lakeland, Florida. The Watson Clinic Foundation makes these annual awards.

**Phillips Medical Systems Award.** Selected by the deans of Student Affairs. Gift of Stethoscope for the senior chosen for excellence in both basic and clinical science.

**Other Awards.** Throughout the year, Duke Medical School receives notification of awards consisting of books, money, and/or plaques or medals to be awarded to students in a variety of fields at all medical schools on a national competitive basis selected by committees of the sponsoring organizations. These awards are screened by the dean's office and publicized appropriately.

## MEDICAL STUDENT RESEARCH SCHOLARSHIPS

Several groups now sponsor medical student research scholarships. In most of the scholarship programs, students selected for scholarships are eligible to receive 32 basic science credits for the experience.

Some have delegated the responsibility to the Medical School to select participants in the program; others have their own independent selection processes. For most programs, a full 12 months is required for the research experience. These scholarships are coordinated through the Scholarship Committee.

## INTERNAL DUKE SCHOLARSHIPS

All Internal Duke Scholarships listed in this section should use the Internal Duke Scholarship Application form and submitted by email to Tami Tuck at *tuck0012@mc.duke.edu*

### Donald B. Hackel Fellowship

The Donald B. Hackel Fellowship in Cardiovascular Pathology provides for biomedical research under the direction of a full time faculty member whose primary appointment is in the Department of Pathology. This twelve month Fellowship carries an annual stipend of $10,000. For further information please contact Dr. Salvatore V. Pizzo, M.D., Ph.D., Professor and Chairman of Pathology, Box 3712 DUMC.

### Duke Clinical Research Scholarship Program

The Duke Clinical Research Scholarship Program provides for clinical research to be conducted here at Duke. Students can chose to complete a one-year basic core of courses including biostatistics, research design, research management and responsible conduct of research. Two-year students can choose to complete the course work and research project that leads to a Master of Health Sciences in Clinical Research degree. There are two main tracks in the Masters' program: clinical research and medical genomics. This ten month scholarship carries an annual stipend of $20,000 plus costs for approved travel and course work. For further information please contact Eugene Z. Oddone, M.D., M.H.S. at *Eugene.oddone@duke.edu* or David F. Kong, M.D., A.M. at *David.F.Kong@duke.edu*.

**Ewald W Busse NIMH Fellowship in Late Life Mood Disorders**

The Department of Psychiatry and Behavioral is offering Ewald W Busse NIMH Fellowship in Late Life Mood Disorders under the direction of a full-time faculty member whose primary appointment is in the Department of Psychiatry. This twelve month Fellowship is sponsored by a training grant from the National Institute of Mental Health and carries an annual stipend of $19,968. Inquiries regarding the fellowship should be directed to Dr. Andrew Krystal, MD, Associate Professor of Psychiatry & Behavioral Sciences, Box 3309 DUMC *krystal@phy.duke.edu* or to Drs. Dan Blazer *blaze001@mc.duke.edu)* and David Steffens *(steff001@mc.duke.edu).*

## Eugene A. Stead Student Research Scholarships

Dr. Eugene A. Stead, Jr. served as Chairman of the Department of Medicine at DUMC from 1947-1967. Because of Dr. Stead's affiliation with the Department of Medicine, this scholarship is awarded exclusively to 3rd year students who are working with mentors who have a primary appointment in the Department of Medicine. The stipend for the 12 months of research is $25,000. Applications can be downloaded on the Internal Scholarship Application link above. The Stead Scholarship Committee is co-chaired by Karen Alexander, MD and Rowena Dolor, MD, MHS, both former Stead Scholars. They may be contacted at Karen Alexander, MD, 919-668-8871 or Rowena J. Dolor, MD, MHS at 919-668-8627.

## Interdisciplinary Research in Medicine or Physiology (Hyperbaric Medicine)

The Center for Hyperbaric Medicine and Environmental Physiology will support a scholarship in basic research carried out by a third-year student in the School of Medicine. The work is to be conducted in a laboratory setting, either in the Center or in the laboratory of a Duke faculty member affiliated with the Center. The research must be relevant to the research goals of the Center. Please contact Barry W. Allen, PhD, in the Center for Hyperbaric Medicine and Environmental Physiology: 668-0031, *mailto:Barry.w.allen@duke.edubarry.w.allen@duke.edu.*

## Ovarian Cancer Research Fellowship

The Ovarian Cancer Research Fellowship in Gynecologic Oncology is offered to one third-year Duke University Medical Student annually. The broad aim of the laboratory group in which the student will work is to elucidate the molecular pathogenesis of ovarian cancer and to translate this knowledge into prevention strategies. This ten month Fellowship carries an annual stipend of $7,000. Students who aspire to careers in Obstetrics and Gynecology will have the highest priority in judging applicants for this award, but this should not discourage others from applying. For questions please contact Dr. Andrew Berchuck, M.D., Professor of Obstetrics and Gynecology, Division of Gynecologic Oncology, Box 3079 DUMC.

## R. Randall Bollinger Surgical Scholarship

The Department of Surgery is offering Research Scholarships in Surgery for MSIII students at Duke University Medical Center. Applicants are reviewed competitively. Funding is variable but has ranged between $3,000 - $10,000 per year in the recent past. Ideally, students will be expected to publish their findings in peer-reviewed journals and to present their research at regional or national scientific meetings. Accepted applications will be expected to interview and present a brief presentation in April for consideration. For more information you may contact Dr. Carlos Marroquin at *marro007@mc.duke.edu.*

## Stem Cell Initiative for Eyes (SCI f Eyes)

This Fellowship will provide one year of support for hands-on laboratory training in stem cell biology related to the design and implementation of stem cell transplantation strategies in animal models of ocular degenerative diseases, including inherited retinal degenerations, ischemic retinopathies, optic nerve disease and corneal dystrophies. For more information, contact **SCI fEyes,** the Stem Cell Initiative for Eyes, at (919) 781-6665 or *scifeyes@nc.rr.com* or visit our website at *http://www.scifeyes.org/www.scifeyes.org.*

## EXTERNAL SCHOLARSHIPS

### The CDC Experience: Applied Epidemiology Fellowship

The Applied Epidemiology Fellowship at CDC provides medical students with an applied hands-on training experience in epidemiology and public health. Eight competitively selected third- and fourth-year medical students from around the country will spend up to one full year at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia. While at CDC, they will participate in an orientation to CDC, applied epidemiology, the national public health system, and the role of physicians in that system. With the guidance of experienced CDC epidemiologists, they will perform epidemiologic analyses and research, design public health interventions, and assist in field investigations. For more information visit their website at *http://www.cdcfoundation.org/pages.html?page=303*.

### Doris Duke Clinical Research Fellowship Program

In 2000, the Doris Duke Charitable Foundation provided grants to seven medical schools to create Doris Duke Clinical Research Fellowship (CRF) Programs at their institutions. Each participating medical school established a CRF Program that awards a minimum of five fellowships each a year to medical students from any U.S. medical school. In November 2001, three additional schools were added to the schools offering Doris Duke Clinical Research Fellowships. Each participating medical school's Doris Duke CRF Program (a) provides medical students with an outstanding one-year fellowship experience in clinical research that includes both didactic and research components; (b) solicits applications from students at any U.S. medical school; and (c) matches students to outstanding clinical research mentors. For more information and a list of participating schools, please visit the website at *http://ddcf.aibs.org*.

### The Howard Hughes Medical Institute/National Institute of Health Program (Cloister)

The Howard Hughes Medical Institute offers several programs to enable selected medical students with an interest in fundamental research to spend a year of intensive work in a research laboratory. Its goal is to strengthen and expand the nation's pool of medically trained researchers. The Research Scholars Program allows an intensive year of research at any academic or non-profit research institution in the United States. Under special circumstances, HHMI also offers continued fellowship support for research/studies. Salary/stipends vary with each program offered by the HHMI. Detailed information is available from the Duke Medical School scholarship coordinator or online at *www.hhmi.org/science/cloister*.

### Hughes Medical Research Training Fellowships

This program selects 60 students from around the United States. Hughes fellows may work in any laboratory of their choice including those within their own medical school. The application, which includes a research plan and a letter from the mentor, must be submitted by January. No interview is required. There is an annual meeting at the NIH where the Hughes fellows present their work. For additional information and an application, please contact the website: *http://www.hhmi.org/fellowships*.

### Intramural Research Program at the National Institute of Environmental Health Sciences

The NIEHS, a division of the National Institutes of Health (NIH), offers medical students the opportunity to pursue research activities focused on environmental-related diseases and dysfunctions in areas such as carcinogenesis, reproduction and development, pulmonary and neurological disorders, and epidemiology on the NIEHS campus at Research Triangle Park. Some of these experiences provide a stipend that is similar to that awarded through the Cloister Program (another program of the NIH). Interested students can obtain additional information by contacting William T. Schrader, Ph.D., Deputy Scientific Director, 919-541-3433 or *schrader@niehs.nih.gov*.

### NIH Clinical Research Training Program

The NIH offers fellowships for training at NIH in clinically related areas in Bethesda, Maryland. Selection of preceptors is made after the award is given. For additional information and an application, please contact the website: *http://www.training.nih.gov/student/index.asp*.

Students applying for the CRTP can also request that their application be forwarded for consideration for the **Interim or Year-Off IRTA Fellowship Program** if they do not receive the CRTP. Although the title implies that a year off is needed, this is not the case for Duke students since this scholarship is approved for the third year.

### Sarnoff Society Endowment for Cardiovascular Science

The Stanley J. Sarnoff Society of Fellows for research in Cardiovascular Sciences is a national program that supports research in cardiovascular research. Ten students are chosen for this 12-month program which is generally conducted away from but can be taken at the student's parent medical school. Duke has typically had one position in this program. There is an annual meeting held in Bethesda, Maryland, at which the fellows (many engaged in research during that year, others who have completed their research year and the newly selected students) have an opportunity to talk about their work and learn about possible research opportunities. For additional information and an application, please contact the website: *http://www.SarnoffEndowment.org* .

### North Carolina Board of Governors Medical Scholarships. (BGMS)

These are awarded annually to 20 first-year medical school candidates who have been accepted for admission at one of the four medical schools in North Carolina. BGMS recipients are selected from among candidates who are financially disadvantaged state residents and who have expressed an interest in practicing medicine in the State of North Carolina. The awards provide a yearly stipend of $5,000 plus tuition and all mandatory fees. The BGMS may be renewed for three years if the recipient continues to demonstrate financial need and maintains satisfactory academic progress.

Additional opportunities and information are available by contacting the third year scholarship coordinator, Tami Tuck, at *tuck0012@mc.duke.edu* or 919-684-5901. Information is updated on a regular basis on the Student Affairs website under Third Year Scholarships *http://medschool.duke.edu/modules/som_sdt_affairs/index.php?id=3*

# Student and Professional Organizations

**Alpha Omega Alpha Medical Honor Society.** Alpha Omega Alpha, founded in 1902, is the national medical honor society. The society works to promote scholarship and research in medical schools as well as high standards of character and comportment toward patients among students and physicians. The Duke chapter of AOA was founded in 1931 and has since played an important role in the medical center. For the past 30 years, AOA has sponsored an original studies symposium where third year medical students present their research findings. The symposium consistently attracts speakers of national prominence to deliver the keynote address. Election into the honor society is restricted to one-sixth of the graduating class. Members are elected in both the third and fourth years of medical school. The primary criterion for election in the third year is superior academic performance as demonstrated by excellent grades in the first two years of medical school. Election in the fourth year is still primarily based on outstanding academic achievement in courses; but additional factors such as comportment towards patients and colleagues, community service, significant research activities, and other similar accomplishments are accorded greater weight. AOA membership is also conferred upon physicians, including alumni and faculty members who have distinguished themselves in research, teaching, and practice.

Duke University Chapter Councilor: Edward C. Halperin, M.D.
President: Allison Troy

**Davison Society.** All medical students are dues-paying members of the Davison Society, named for the first dean of Duke University School of Medicine. The society is governed by the Davison Council which consists of elected officers (president, service vice-president, social vice-president, secretary, and treasurer) and elected representatives from each class. Primary responsibilities of the council include: chartering of medical student groups, budgeting funds for student groups and medical school activities, organization of medical school service activities and social events, appointment of medical students to Medical Center and University committees, coordinating the selection of faculty and resident awards for excellence in teaching, and representing student views to pertinent faculty and administration. The Davison Council also coordinates medical student projects with community service groups such as Habitat for Humanity, Share Your Christmas, Durham Public Schools, Durham Community Kitchen, Adopt-A-Grandparent, Women's Health Focus Group, and Health Education in Durham Public Schools (HEY Durham).

Meetings of the council occur every two weeks during the academic year. Minutes of council meetings and information pertinent to the student body are posted on the medical students' Internet site, *http://www.duke.edu/web/medstudent.* The members of the council are elected in the spring of each year except for the first year class representatives who are elected during the first fall after matriculation. An annual formal dance, the Davison Ball, is held in the fall.

Medical student groups affiliated with, and in the past funded by, the Davison Society include: the Association of American Medical Colleges (Organization of Student Representatives), the American Medical Association (Medical Student Section), the American Medical Women's Association, the American Medical Student Association, the North Carolina Student Rural Health Coalition, the North Carolina Medical Society Student Chapter, the Student National Medical Association, the Christian Medical and Dental Society, the Gay-Straight Alliance, the Asian-American Medical Student Association, the Duke Jewish Medical Student Association, Student Curriculum Committee, Duke Comprehensive Cancer Center Volunteer Network, AIDS Education Roadshow, Lenox Baker Children's Hospital Program, Duke Medical Gleaning Program, Homeless Shelter Clinic, Children's Miracle Network Fair, the *Aesculapian* (yearbook), HuMed, Family Medicine Interest Group, the Mind-Body Interest Group, Geriatrics Interest Group, OB-GYN Interest Group, Emergency Medicine Interest Group, International Health Interest Group, Pediatrics Interest Group, Palliative Care Interest Group, Orthopedics Interest Group, Cardiology Interest Group, Neurology Interest Group, the N.C. Wilderness Club, and the Medical Ethics and Humanities Lecture Series. You can find an updated list of officers at *http://www.duke.edu/web/medstudent*

President: Drew Munroe
Service Vice-President: Carey Dozier
Treasurer: Christie Eyler
Social Vice-President: Brandon Isariyawongse
Secretary: Michael Barfield

**The Engel Society.** The Engel Society, established in 1966 as a memorial to Professor Frank L. Engel, is designed to promote intellectual and social interaction between students and faculty. Membership is limited to six junior students and six senior students who have demonstrated an inquisitive nature, humanitarian interests, and high scholastic ability. Four faculty members are selected annually by members of the society for three-year terms. Four to six programs are held each year, and all students may be invited to participate in lecture programs sponsored by the Society.

Engel Society Moderator: Delbert R. Wigfall, M.D., Box 3959, Duke University Medical Center, Durham, North Carolina 27710.

**Duke Medical Alumni Association.** The Duke Medical Alumni Association seeks to support and promote the interests of Duke University Medical Center and its extended community and to nurture life-long relationships and learning. The Duke Medical Alumni Association contributes a framework through which the Medical Center family continues to thrive, alumni concerns are addressed, and alumni participation in the life and vitality of Duke University Medical Center is encouraged. Our membership reaches back to 1932 and embraces those just now beginning their first year in medical school. Today, the Duke Medical Alumni Association includes more than 12,000 Duke School of Medicine graduates and former house staff members who live and work in every state across the nation and in 46 countries around the globe; encompasses future physician alumni, with a roster of some 400 current students and some 800 house staff officers; and seeks the involvement of nearly 1,000 faculty members at Duke University Medical Center. Each year the Duke Medical Alumni Association sponsors events and activities for students including the Duke Medical Alumni Association Fitness Center; the Student-Alumni Link program, Medical Families Weekend; the Davison Ball; programs during Medical Alumni Weekend, student orientation activities, including the annual Freshman Orientation Picnic as well as a copy of *Davison of Duke*, the memoirs of the Medical School's first dean; graduation gifts and distribution of the publications, *DukeMed Magazine and DukeMed Alumni News.*

President: Roslyn B. Mannon, MD '85, HS '85 - '90, Chevy Chase, MD

President Elect: William C. Andrews, T ’76, MD ’80, HS ’82 - ’86, Lynchburg, VA

Ellen R. Luken, Executive Director, Medical Alumni Affairs

# Courses of Instruction

## ANESTHESIOLOGY

### 2nd Year Clinical Selectives

**ANESTH-220C. CLINICAL ANESTHESIOLOGY.** (Operating Room). Students will participate in the pre-, intra-, and post-operative anesthetic management of patients while assigned 1:1 to an anesthesiologist. Clinical assignments will include the general and cardiothoracic Operating Rooms, as well as subspecialty areas and pain management. Additional hands-on practice will occur in the Patient Safety Center (human simulator). There will be problem-based learning sessions on pre-operative patient evaluation and perioperative risk, anesthetic techniques and monitoring, airway management, pharmacology, physiology, and anatomy; and procedures may include vascular access, airway management, and selected others; Grand Rounds; and other conferences. Max: 4, Min: 1. *Grant and Staff*

**ANESTH-221C. PAIN MANAGEMENT.** Students will participate in both acute and chronic pain management. Each student is assigned daily to an individual fellow or attending physician who supervises the student's active involvement. This course emphasizes a multidisciplinary approach appropriate for the individual patient. The effect of pharmacotherapy, interventional procedures, physical and psychotherapy is stressed. Students will observe various interventional procedures. Students will also attend weekly pain conference, journal club, and biweekly multidisciplinary pain conference. The course is offered throughout the year. If more than 1 absence is anticipated, the elective should be rescheduled. Students with questions may contact the course director, Billy Huh, M.D., (beeper #7990). Credit: 2 Enrollment: 1. *Huh, Ginsberg, pain fellows*

### 2nd Year Clinical Electives

**ANESTH-250C. CLINICAL ANESTHESIOLOGY.** The student will participate in the pre-, intra-, and post-operative anesthetic management of patients while assigned to an individual resident or attending anesthesiologist. Usually, (s)he will spend two weeks in the general Operating Rooms; one in the cardiothoracic Operating Rooms; and a fourth week in subspecialty areas including the Hyperbaric facility, the Acute Pain Service, and others. Learning opportunities will include pre-operative patient evaluation, anesthetic technique selection, airway management, pharmacology, physiology, and anatomy; and procedures such as vascular access, including central venous and arterial line placement, and patient monitoring. These areas will be reinforced by a lecture series, Grand Rounds, and other conferences. In the fall, priority in registration is given to students considering careers in Anesthesiology. Students are expected to attend the first day and are strongly advised not to miss any of the first week. More than 5 absences are not permitted. Max: Summer session 41 = 4. Credit: 4. *Dwane and Staff*

### 4th Year Clinical Electives

**ANESTH-430C. DIVING AND HYPERBARIC MEDICINE.** Students participate actively in assigned patient care and clinical projects. Well-focused segments of ongoing clinical work provide intensive exposure to clinical physiology and pharmacology. Students will be assigned an attending physician (mentor), desk and computer space in the Hyperbaric Center. Consultative services are provided for inpatients and outpatients from orthopedics, medicine, radiation oncology, intensive care units, and preoperative and postoperative care units. Specific indications for hyperbaric oxygen therapy are used in clinical care and in developing translational projects. Students are guided in producing concrete clinical presentations and reports related to the field. Credit: 4-8. Enrollment: 1 per faculty mentor. *Piantadosi and staff*

**ANESTH-440C. CLINICAL ANESTHESIOLOGY.** The student will participate in the pre-, intra-, and post-operative anesthetic management of patients while assigned to an individual resident or attending anesthesiologist. Usually, (s)he will spend two weeks in the general Operating Rooms; one in the cardiothoracic Operating Rooms; and a fourth week in subspecialty areas including the Hyperbaric facility, the Acute Pain Service, and others. Learning opportunities will include pre-operative patient evaluation, anesthetic technique selection, airway management, pharmacology, physiology, and anatomy; and procedures such as vascular access, including central venous and arterial line placement, and patient monitoring. These areas will be reinforced by a lecture series, Grand Rounds, and other

conferences. In the summer term (sections 41 and 42), and fall (sections 41-43), priority in registration is given to students considering careers in Anesthesiology. Students are expected to attend the first day and are strongly advised not to miss any of the first week. More than 5 absences are not permitted. Max: Fall sessions 41=3; 42 = 2; 43 = 3; and 44 = 4. Spring sessions 41= 6; 42 = 4. Summer sessions 41-42 = 4. (Not offered summer 43-44.) Credit: 4. *Dwane and Staff*

**ANESTH-441C. SURGICAL INTENSIVE CARE.** This course is designed to broaden the student's knowledge and experience in managing critically ill surgical patients. Under supervision, students function as sub-interns in the Surgical Intensive Care Unit (SICU). Students are re-assigned their own patients and actively participate in daily rounds as part of the SICU team. There is a daily lecture on aspects of critical care. Students take call one night in four and work on a one-on-one basis with SICU house staff in the supervised management of critically ill patients. Time may be spent in the SICU at Duke University Medical Center (trauma, vascular surgery, liver-kidney-pancreas transplantation, general surgery) and/or the SICU at the Durham VA Medical Center (cardiothoracic and vascular surgery, general surgery). There is emphasis on teaching of procedures and techniques necessary for the management of all critically ill patients including hemodynamic assessment and monitoring, cardiovascular resuscitation and use of vasoactive drugs, ventilator management including ARDS, prevention and management of nosocomial infections, and ethical decision making in ICU. Students are formally evaluated by the SICU house staff and the attending physician. C-L: SURGERY 441C. Credit: 5. Enrollment: max 2. *Young and staff*

**ANESTH-445C. PHYSIOLOGY AND MEDICINE OF EXTREME ENVIRONMENTS.** Advanced topics in the physiology and medicine of ambient pressure, immersion, gravity, temperature, and gas composition. Environments considered include: diving and hyperbaric medicine; hot/cold terrestrial and water operations; microgravity and high-g acceleration; high altitude. Basic mechanisms and medical management of associated diseases are examined including: decompression sickness; altitude sickness; hypothermia and hyperthermia; hypoxia; carbon monoxide poisoning; oxygen toxicity. An optional laboratory includes topics in the design and operations of pressure vessels for human occupancy, life support equipment, and sham treatment of medical problems. Prerequisites: Human anatomy and physiology; and instructor permission. Credit: 3 without lab; 4 with lab. Enrollment: max 12. *Vann, Pollock, and Stolp*

**ANESTH-446C. ACUTE AND CHRONIC PAIN MANAGEMENT.** Students will participate in both acute and chronic pain management. Each student is assigned daily to an individual fellow or attending physician who supervises the student's active involvement. This evaluation and treatment emphasizes a multidisciplinary approach appropriate for the individual patient. The impact of pharmacotherapy including opioids, NSAID's, local anesthetics, adjuvant drugs; interventional procedures such epidural and regional catheter placement, nerve blocks, neurolytic procedures, as well as implatable devices; and physical and psychotherapy is stressed. Students will observe and/or participate in various interventional procedures. In addition to this clinical work, students attend weekly pain conference, journal club, and biweekly multidisciplinary pain conference. The course is offered monthly throughout the year. More than two absences must be made up, and if more than five absences are anticipated, the elective should be re-scheduled. Students with questions may contact the course director, Billy Huh, M.D., (beeper #7990). Credit: 4. Enrollment: max 2, min 1. *Huh, Parris, Rogers, Fras, Ginsberg, Goldberg, Lindsay, and Scott*

## BIOCHEMISTRY

### Basic Science Electives

**BIOCHEM-317B. MEMBRANES, RECEPTORS, AND CELLULAR SIGNALING.** Basic and current concepts of the biological membranes, membrane proteins and organization; mechanism of action of hormones at the cellular level including hormone-receptor interactions, secondary messenger systems for hormones, mechanism of regulation of hormone responsiveness, regulation of growth, differentiation and proliferation, cellular electrophysiological mechanisms of transport and ions channels, secretory and sensory stimulus sensing and transduction. Some lectures stress the clinical correlation of the basic concepts in the course. C-L: CELLBIO-317B; Graduate School. Credit: 3. *Caron, Casey, and invited lecturers*

**BIOCHEM-327B. RESEARCH IN BIOCHEMISTRY.** In a limited number of cases, a student is permitted to participate in the research program of a faculty member. Acceptance is by individual arrangement with the proposed faculty preceptor. Credit: 1-16. *Staff*

**BIOCHEM-328B. RESEARCH IN BIOCHEMISTRY.** A student may obtain first hand research experience by participating in the research program of a faculty member. Acceptance is by individual arrangement with the proposed faculty preceptor. Credit: 1-16. *Staff*

## BIOLOGICAL ANTHROPOLOGY AND ANATOMY

### Basic Science Electives

**BAA-314B. ANATOMY OF THE HEAD AND NECK.** This course is designed to be a review of the head and neck, emphasizing its phylogenetic and ontogenetic development along with clinically important features of the anatomy of this region. Credit: 2. Enrollment: min 5, max 12. *Staff*

**BAA-321B. ANATOMY OF THE TRUNK.** Emphasis is on the anatomy of the thoracic, abdominal, and pelvic organs including relationships, blood supply, and innervations and, where practical, developmental and microscopic anatomy. The dissections are supplemented with audiovisual presentations and discussions with such prosections as are available. Credit: 2. Enrollment: min 8, max 20. *Staff*

**BAA-324B. TUTORIAL IN GROSS ANATOMY.** A detailed review of selected regions of the human body in the context of the "core" gross anatomy sequence. The student plans prosections, special presentations, etc., with staff. The student also elects to study one or more selected regions in consultation with staff. Credit: 1-5. Enrollment: min 1, max 5. *Staff*

**BAA-331B. ANATOMY OF BACK AND EXTREMITIES.** The course includes complete dissection of back and the extremities including pectoral and pelvic girdles. Visual aids are used extensively. Course planned for orthopaedics, general practice, or neurosurgery. Credit: 3. Enrollment: min 6, max 20. *Bassett and staff*

## CELL BIOLOGY

### Basic Science Electives

**CELLBIO-312B. THE CELL AND MOLECULAR BIOLOGY OF REPRODUCTION.** During the last decade, cell, molecular, and neurobiological investigations have dramatically advanced our understanding of reproduction. In this course, we aim to focus on these recent findings to present an integrated view of the reproductive process in males and females. The general areas to be covered include neuroendocrinology, reproductive endocrinology, gametogenesis, and fertilization, although recent studies in areas such as gene regulation; intercellular communication; hormones, growth factors and signaling; and early development and differentiation are emphasized. C-L: Graduate School. Credit: 3. Enrollment: min 6, max 20. *Saling and Schomberg*.

**CELLBIO-317B. CELLULAR SIGNALING.** Basic and current concepts of mechanism of action of hormones at the cellular level including hormone-receptor interactions, second messenger systems for hormones, plasma membrane receptor signaling (G protein-coupled receptors, receptor tyrosine kinases, phospholipid signaling, ion channels), intracellular signaling pathways (calcium, cyclic nucleotides, nuclear receptors, phosphatases), regulation of growth and differentiation and pathophysiology involving signaling pathways. Credit: 3. spring. Enrollment: 50. *Caron, Casey, Pendergast, York, VanDongen, Heitman, McDonnell, Means, Shenolikar, and Kornbluth*

**CELLBIO-341B. MOLECULAR CELL BIOLOGY.** Current research topics in cell biology presented in a lecture and discussion format based on recent research papers. Topics include: protein secretion and trafficking; the nucleus; cytoskeleton and cell motility; extracellular matrix and cell adhesion; growth factors and signaling; cell cycle. C-L: Graduate School. Credit: 4. *Bennett and staff*

**CELLBIO-340B. TUTORIAL IN CELL BIOLOGY/PHYSIOLOGY.** Selected topics are chosen for intensive reading and discussion. Topics may be chosen relating to basic problems of cytology, growth and development, biophysics, endocrinological control, neuroanatomy, physiological differentiation, and evolutionary origins of functional microsystems. Prerequisites: permission of faculty preceptor. C-L: Graduate School. Credit: 1-3. Enrollment: max 8. *Staff*

**CELLBIO-345B. THE MOUSE AS A MODEL ORGANISM.** Graduate level introduction to the mouse as a model system. Course will cover embryology, genetics and molecular manipulation of the mouse embryo. Suitable for students who plan to use the mouse as an experimental model of human disease. Credit 2. Enrollment 20. *Capel, Hogan and Klingensmith*

## COMMUNITY AND FAMILY MEDICINE

### Required Course

**COMMFAM-205C. FAMILY MEDICINE.** This basic course in family medicine consists of an four-week clinical clerkship in the second year. The course goal is to provide students with an understanding of the principles of family medicine and how these apply in community practice. The course emphasizes continuous and comprehensive health care for people of both sexes and all ages within the context of their social groups and communities. Particular attention is paid to the diagnosis and treatment of common medical problems and to health maintenance, ambulatory care, continuity of care, and the role of consultants in primary care. Other topics covered include social factors such as the doctor-patient relationship, the role of the physician in the community, and the economics of health care delivery. Students are placed with community-based faculty who are practicing family physicians in communities outside of Durham, principally within North Carolina. Most of these preceptorship sites are in rural communities, providing students with exposure to many issues of rural health care such as farming and other occupational injuries, transportation difficulties, and local customs. The eight-week sites are scheduled based on the availability of the preceptors. These sites may not be available every rotation. Students gain extensive experience in diagnosing and managing patient problems in an ambulatory care setting under the guidance of the department's faculty. In addition, the clerkship provides students with opportunities to see patients in a variety of other settings, including home, nursing home, and community hospital. There is also the opportunity for medical students to be paired with physician assistant students at a community practice site for the purpose of working with mid-level practitioners in a team practice setting. Note: COMMFAM-205C is strongly recommended for all students in the primary care program. Changes in the rotation are not made less than 12 weeks prior to the start of the rotation. Credit: 4. *Copeland*

### Basic Science Elective

**COMMFAM-338B. TUTORIAL IN COMMUNITY AND FAMILY MEDICINE.** An individually arranged experience in which the student participates in the research program of a faculty member. The subject matter, course credit, and meeting time are arranged with the faculty member. Each student meets regularly with his faculty preceptor and carries out a project related to the preceptor's work. Through these discussions and the project, the student is able to develop an understanding of the discipline involved. Possible areas include community health, health education, geriatrics, family dynamics, occupational health, functional health and quality of life assessment, severity of illness assessment, case-mix adjustment, medical education, management sciences, economic aspects of health care, computer technology, biostatistics and epidemiology, clinical decision-making, diagnosis and management of common problems, alcoholism and social support systems. Because of the variety of projects available and the necessity of prior arrangements, it is essential that interested students consult with the instructor and staff at least two months before the beginning of the term selected. Prerequisite: permission of instructor. Credit: 1-16. *Research Faculty - All interested students contact the coordinator of Medical Student Programs at 681-3066.*

### 2nd Year Selectives

**COMMFAM-220C. OCCUPATIONAL MEDICINE: PREVENTION & POPULATIONS.** This selective provides hands-on experiences in the broad, interdisciplinary field of Occupational Medicine. The focus is to apply key principles of Preventive Medicine, Population Health Management, and Prospective Health through participating in a broad range of occupational medicine activities. In clinic visits students will examine patients, interpret multiple types of information (beyond typical medical data), and communicate with key parties. Throughout the Durham area, they will assess worksite/environmental hazards and assist in reporting on them. . Working with Faculty mentors, they will find and draw upon information resources (many of which may be new to them) to address

complex questions. All students will engage in interactive learning modules on prevention; attend didactic sessions on key aspects of Occupational Medicine, and perform problem/project-based learning. Students will complete their own health risk assessments, as well as helping with health promotion activities and health risk communications to patients. *Brian Caveney and Carol Epling*

**COMMFAM-221C. PRACTICAL CLINICAL NUTRITION.** This course will cover the topics in clinical nutrition that will be of most use to medical students interested in primary care. Participants will have a chance to observe and practice interviewing and counseling skills. Topics will include weight management, eating disorders, diabetes, hypertension, cancer, pregnancy, middle age, elderly, and addictive behaviors, and population-based nutrition. *Murphy,G. and Alphin, F.*

**COMMFAM-222C. PROSEPECTIVE HEALTH PLANNING AND INTEGRATIVE MEDICINE.** This selective will provide an evidence-based and experiential understanding of prospective health planning using the Duke Center for integrative Medicine (DCIM), Domains of Health. Methods include literature reviews, clinic visits, practitioner and patient interviews, and observation of lifestyle programs at the Center for Living. Students will receive faculty mentoring, Mindfulness-Based Stress Reduction training, and health coaching. They will set personal health goals, develop their own health plans, and give presentations about their experiences. *Sam Moon and Tracy Gaudet*

## 2nd Year Clinical Electives

**COMMFAM-252C. THE COMPUTER TEXTBOOK OF MEDICINE.** Students participate in the ongoing development of a computerized database in cardiovascular disease. They participate in research concerning the diagnosis, treatment, and prognosis of patients with coronary artery disease. And, they learn how to make predictions about outcome based on test results of patients on the cardiology service. Prerequisite: permission of instructor. Credit: 4. Enrollment: max 5. *Wagner, Califf, Lee, Peterson, and Jollis*

**COMMFAM-253C. OCCUPATIONAL AND ENVIRONMENTAL MEDICINE.** This elective is designed to enhance the student's basic science skills in several important areas related to occupational medicine: occupational injury and illness prevention, and epidemiology, health management for employee populations, industrial toxicology, worksite wellness and prevention programs During this four week rotation, students will complete readings related to these areas, observe surveillance exams and prospective health planning visits in clinics, participate in lectures and seminars, learn to conduct computerized database searches concerning industrial toxicology, and (as available) visit industrial sites as part of the experience. Students will also be given at least one project which will involve one of the topics described above. Upon completion of the rotation, students can expect to have practical and useful skills applicable to occupational medicine and worksite health programs. Credit: 4. Enrollment: max 1. Two months advance notice and permission from instructor is required. All interested students should contact the coordinator of Medical Student Programs at 681-3066, or call the course director, Dr. Epling at 286-1722, ext 279. *Epling, Darcey and Moon , MD and Sam Moon, MD MPH*

**COMMFAM-263C. COMMUNITY HEALTH.** This elective will introduce students to the concepts and practice of community-based and population-based health care. Population-based health care is becoming increasingly important in addressing the health care needs of this nation. This elective will help students understand how Duke serves communities through collaborative, innovative, interdisciplinary clinical services, educational programs, and applied research. By allowing students to participate in actual programs, role modeling and experiential learning are used to supplement and apply what is learned in the required text-based materials of the course. Because the specific course activities will depend upon the student's particular interests and the community health activities ongoing at the time of the elective, each student's experience will be individually designed. To participate in this course, students must contact Michelle J. Lyn, Director, Educational Programs, Division of Community Health, at least six weeks prior to the start of the course. At that time, Ms. Lyn and the student, along with appropriate community programming faculty and staff, will plan the specific activities that will be undertaken by that student, and the requirements for the student's successful completion of the course. Credit: 4; Enrollment max: 1. *Lyn, Sheline, Yaggy*

**COMMFAM-269C. COMMUNITY AND FAMILY MEDICINE PRECEPTORSHIP.** An individually tailored preceptorship which allows students to observe and participate in aspects of the

broad scope of Community and Family Medicine, including delivery of care to individuals, families, and populations within the context of the community in which they live. The rotation supplements and complements the second-year core clerkship, and allows the student further exploration of specific areas of interest. Interested students should call 919-681-3066 to arrange a rotation in Lifestyle Management. A Lifestyle Management rotation is also available. Drops are not accepted. Prerequisites: permission of instructor and completion of COMMFAM 205C. Credit: 4. Enrollment max: 1. *Copeland and staff*

## 4th Year Clinical Electives

**COMMFAM-401C. SUBINTERNSHIP IN FAMILY MEDICINE.** This course provides senior medical students with an intense patient-oriented clinical rotation with responsibilities and autonomy similar to that of an intern. This clerkship will provide a unique opportunity to participate in the department's effort to test new models of care in the delivery of team-based chronic disease management in the ambulatory and community setting. Students will see patients in the same format as entering interns with a patient panel supervised by senior faculty at Duke Family Medicine Center. Each clerk will perform a quality improvement project in conjunction with the Chronic Disease Management Program. 80percent of the rotation will be direct clinical care in the Duke Family Medicine Center. The remaining 20percent will occur on the Family Medical Inpatient Consult Service and Community Health Division program. The inpatient component will include rounding on all Family Medicine patients admitted to Duke Hospital including outpatient care. The Student will provide daily communication of the patient's status with the primary provider. The student will also assist in the supervision of prenatal patients and attend the labor and delivery of all patients delivered or seen for antepartum complications. Clinical instruction and supervision on each patient encounter is provided by senior level housestaff and faculty members of the Department of Community and Family Medicine. Students are advised to contact the department as early as possible for course approval (at least eight weeks in advance). No drops are permitted within 60 days of the first day of the rotation. Prerequisite: permission of instructor and successful completion of the Family Medicine Clerkship. Credit: 5. Enrollment: max 1 per session. *Copeland, Gradison and staff*

**COMMFAM-423C. OCCUPATIONAL AND ENVIRONMENTAL MEDICINE.** This elective is designed to enhance the student's basic science skills in several important areas related to occupational medicine: occupational injury and illness prevention, and epidemiology, health management for employee populations, industrial toxicology, worksite wellness and prevention programs During this four week rotation, students will complete readings related to these areas, observe surveillance exams and prospective health planning visits in clinics, participate in lectures and seminars, learn to conduct computerized database searches concerning industrial toxicology, and (as available) visit industrial sites as part of the experience. Students will also be given at least one project which will involve one of the topics described above. Upon completion of the rotation, students can expect to have practical and useful skills applicable to occupational medicine and worksite health programs. Credit: 4. Two months advance notice and permission from instructor is required. Enrollment: max 1 per month except can accept two in March. All interested students should contact the coordinator of Medical Student Programs at 681-3066, and call the course director, Dr. Epling at 286-1722, ext 279. *Epling, Darcey and Moon , MD and Sam Moon, MD MPH*

**COMMFAM-432C. INTEGRATIVE MEDICINE AND PROSPECTIVE HEALTH.** This month-long elective will provide an evidenced-based and experiential understanding of complementary and alternative medicine. There will be reviews of the literature by Duke faculty members and critiques of the best available randomized, controlled trials by the students. Credentialing and training issues will be discussed, as well as possible risks and hazards. Small groups of students will make visits to the offices of community practitioners. During these sessions, one of the students will undergo an evaluation and lifestyle assessment, while the other students act as observers. The students will give presentations about their experiences, and there will be a final exam. Two months advance notice All interested students should contact the coordinator of Medical Student Programs at 681-3066 Prerequisites: None. Credit: 4. Enrollment: min 2, max 4. *Tracy Gaudet and Sam Moon*

**COMMFAM-433C. COMMUNITY HEALTH.** This elective will introduce students to the concepts and practice of community-based and population-based health care. Population-based health

care is becoming increasingly important in addressing the health care needs of this nation. This elective will help students understand how Duke serves communities through collaborative, innovative, interdisciplinary clinical services, educational programs, and applied research. By allowing students to participate in actual programs, role modeling and experiential learning are used to supplement and apply what is learned in the required text-based materials of the course. Because the specific course activities will depend upon the student's particular interests and the community health activities ongoing at the time of the elective, each student's experience will be individually designed. To participate in this course, students must contact Michelle J. Lyn, Director, Educational Programs, Division of Community Health, at least six weeks prior to the start of the course. At that time, Ms. Lyn and the student, along with appropriate community programming faculty and staff, will plan the specific activities that will be undertaken by that student, and the requirements for the student's successful completion of the course. Credit: 4; Enrollment max: 2. *Lyn, Sheline, Yaggy*

**COMMFAM-435C. HEALTH PROMOTION AND DISEASE PREVENTION.** This elective is an intensive clinical experience in health promotion and disease prevention. Students see patients in the Duke Family Medicine Center and participate in a variety of activities designed to help them provide excellent health maintenance care. Specific content areas addressed include counseling skills in nutrition, safe sex practices, and smoking and alcohol cessation, as well as screening tests and immunizations. Prerequisite: permission of instructor. Two months advance notice. All interested students should contact the coordinator of Medical Student Programs at 681-3066 Credit: 4. Enrollment: min 1, max 4. *Yarnall and staff*

**COMMFAM-439C. ADVANCED CLERKSHIP IN FAMILY MEDICINE.** This course provides intensive instruction and practice in the care of primary care patients in the community setting. Students work at Duke Family Medicine Center. This course has an outpatient focus and is recommended for students who would like to improve their skills in the care of ambulatory patients. Students learn about quality of care and patient safety in this setting. They will develop skills in chronic disease management and prevention, as well as common outpatient problems. Students are involved with day to day patient care under the supervision of family physician faculty and residents. There are a limited number of students who can take this course at any given time and preference is given to those students entering Family Medicine Residencies. Students are advised to contact the department as early as possible for course approval (at least eight weeks in advance). No drops are permitted within 60 days of the first day of the rotation. Prerequisite: permission of instructor. Credit: 2-8. Enrollment: max 2. *Gradison and staff*

**COMMFAM-441C. FAMILY MEDICINE CONTINUITY EXPERIENCE.** Students manage a panel of patients over an extended period of time at the Duke Family Medicine Center under the supervision of one family physician faculty member. Patient care is scheduled for one to two half-days a week for two to four months. The rotation may be repeated to provide further continuity. With permission, this course can be audited; a project is required for course credit. Due to the need for clinic schedule arrangements, students are advised to contact the department as soon as possible for course approval (at least eight weeks in advance). Priority will be given to primary care track students. Prerequisite: permission of instructor. Credit: 2-8. *Copeland and staff*

**COMMFAM-442C. THE COMPUTER TEXTBOOK OF MEDICINE.** Students participate in the ongoing development of a computerized database in cardiovascular disease. They participate in research concerning the diagnosis, treatment, and prognosis of patients with coronary artery disease. And, they learn how to make predictions about outcome based on test results of patients on the cardiology service. Prerequisite: permission of instructor. Credit: 2-4. Enrollment: max 5. *Wagner, Califf, Lee, Peterson, and Jollis*

**COMMFAM-449C. COMMUNITY AND FAMILY MEDICINE PRECEPTORSHIP.** An individually tailored preceptorship which allows students to observe and participate in aspects of the broad scope of Community and Family Medicine, including delivery of care to individuals, families, and populations within the context of the community in which they live. The rotation supplements and complements the second-year core clerkship, and allows the student further exploration of specific areas of interest. A wide variety of practice types and geographic locations are available; students may choose from an extensive list or nominate a new site. Opportunities are also available within the Duke

system, including: Sports Medicine, Jeff Bytomski, M.D. Andrew Bonin, M.D. ;Lifestyle Management, Howard Eisenson, M.D. Kathryn Andolsek, M.D., M.P.H. All interested students should contact the coordinator of Medical Student Programs at 681-3066 to arrange a rotation in their area of interest. Because of the necessity for site approval and prior arrangements with preceptors, it is essential that this contact be made as soon as possible and at least three months prior to the desired rotation. Drops are not accepted. Prerequisites: permission of instructor. Credit: 4. *Copeland and staff*

## DIVISION OF CLINICAL INFORMATICS

### Basic Science Electives

**MEDINFO-333B. INTRODUCTION TO MEDICAL INFORMATICS.** An in-depth study of the use of computers in biomedical applications. Important concepts related to hardware, software, and applications development are studied through analysis of state-of-the-art systems involving clinical decision support, computer-based interviewing, computer-based medical records, departmental/ancillary systems, instructional information systems, management systems, national data bases, physiological monitoring, and research systems. Approval of the instructor required. C-L: BME-243 (Graduate School). Credit: 3. *Staff*

**MEDINFO-334B. ARTIFICAL INTELLIGENCE IN MEDICINE.** An introduction to basic concepts of Artificial Intelligence (AI) and an in-depth examination of medical applications of AI. The course includes heuristic programming, a brief examination of the classic AI programming languages (LISP and PROLOG), and a study of rule-based systems and cognitive models. Specific applications examined in detail include MYCIN, ONCOCIN, PIP, CASNET, ILIAD, QMR, and DXPLAIN and selected EXPERT systems. Approval of the instructor required. C-L: BME-241 (Graduate School). Credit: 3. *Staff*

**MEDINFO-336B. CLINICAL INFORMATION MANAGEMENT.** This course will include a look at computer-based patient records, including current state and direction of research; decision support and knowledge extraction; networking; the Internet and Web-based design; legislative issues relating to information management; and new concepts and direction in health information management. The course will also deal with such current topics as distance learning, telehealth, consumer informatics, and home health. Data warehousing and data sharing issues will also be discussed. Opportunity for some hands-on experience will be provided. Credit: 2. Enrollment: max 10, min 4. *Staff*

**MEDINFO-339B. PRECEPTORSHIP IN MEDICAL INFORMATICS.** An individualized research program under the direction and supervision of a member of the faculty of the Clinical Informatics Program. Credit: 1-16. *Staff*

## FREE TIME

### Clinical Science Elective

**FREETIME-450C. FREE TIME.** Students with no classes scheduled for a particular section must sign up for free time.

## INTERSESSION

### Required Courses

**INTERSES-201C. INTERSESSION.** These one-week mandatory sessions between clerkship rotations are designed to integrate basic science knowledge with clinical reasoning skills and to incorporate topics not offered in other areas of the curriculum such as interdisciplinary teamwork, integrative medicine, and palliative care. Major components of the program include clinical reasoning skills, health care team visits, and pre-clerkship activities that offer preparatory information for each student's upcoming clerkship rotation. Clinical reasoning skills are taught through patient cases that focus on different clinical topics for each Intersession (e.g., clinical oncology, geriatrics, critical care). In clinical reasoning activities students work in teams to gain an appreciation for the value of an interdisciplinary/multidisciplinary approach to patient care. To further their appreciation for the health care team, students spend one half-day during each Intersession with a non-physician member of the team (e.g.,

nurses, social workers, pharmacists, physical therapists, etc.) Please contact Mary Sexton, Intersession Coordinator at 684-4340 for more information. *Kaprielian*

## IMMUNOLOGY

### Basic Science Electives

**IMMUNOL-329B. PRECEPTORSHIP IN IMMUNOLOGY.** An individual reading and/or laboratory course in specialty areas supervised by an individual faculty member. Acceptance, nature of topic, and amount of credit by individual arrangement with proposed faculty member. Prerequisites: to be determined by instructor. Credit: 1-16. *Staff*

**IMMUNOL-330B. Medical Immunology.** A brief review of basic concepts of immunology is followed by in-depth discussions of the role of immune mechanisms in the pathogenesis and treatment of human diseases. Principal emphasis is placed on immune deficiency diseases, hypersensitivity, transplantation, infectious diseases, autoimmunity, tumor immunology, and immunohematology. Applicable the classes include patient presentations and laboratory demonstrations. C-L: MIC 330B; Graduate School. Credit: 5. F. *Ward and Staff*

**IMMUNOL-332B. GENERAL VIROLOGY AND VIRAL ONCOLOGY.** The first half of the course is devoted to a discussion of the structure and replication of mammalian and bacterial viruses. The second half deals specifically with tumor viruses which are discussed in terms of the virus-cell interaction, the relationship of virus infection to neoplasia, and the application of retroviruses in molecular and developmental biology. C-L: MICROBIO-252B; Graduate School. Credit: 3. Enrollment: min 5. *Keene and staff*

**IMMUNOL-341B. COMPREHENSIVE IMMUNOLOGY.** An intensive course in the biology of the immune system and the structure and function of its component parts. Major topics discussed are: properties of antigens; specificity of antibody molecules and their biologic functions; cells and organs of the lymphoid system; structure and function of complement; inflammation and non-specific effector mechanisms; cellular interactions and soluble mediators in lymphocyte activation, replication, and differentiation; regulation of immune responses, neoplasia and the immune system; molecular structure and genetic organization of immunoglobulins, histocompatibility antigens, and T cell receptor. C-L: MICROBIO-291B; Graduate School. Credit: 3. Enrollment: max 10. *Krangel and staff*

## INTERDISCIPLINARY

### Required Courses

**INTERDIS-100B. MOLECULES AND CELLS.** A course designed for first year medical students that focuses on the molecular and cellular principles of human disease. The course has four components, which are tightly integrated: biochemistry, cell biology, genetics, and a series of clinical correlations. The biochemistry component re-emphasizes the relationship between structure and function of the major classes of macromolecules in living systems including proteins, carbohydrates, lipids, and nucleic acids. The metabolic interrelationships and control mechanisms are discussed as well as the biochemical basis of human diseases. The cell biology component emphasizes the structure and function of the cells and tissues of the body. The laboratory provides practical experience with light microscopy studying and analyzing the extensive slide collection of mammalian tissues. The genetics component emphasizes molecular aspects of the human genome, the structure of complex genes, regulation of gene expression, experimental systems for genetic analysis, human genetics -- including population genetics and genetic epidemiology, the use of genetic analysis for the identification of disease causing genes, cytogenetics, cancer genetics, and genetic diagnosis and counseling. The series of clinical correlations links the material covered in the basic science lectures to clinical problems. Many of the correlations include an interview with a patient. Credit: 8. Enrollment: max 105. *Garcia-Blanco, Nicchitta, Raetz, and staff*

**INTERDIS-101B. NORMAL BODY.** This core course of the preclinical curriculum is intended to present the scientific principles underlying the structure and function of the normal body, thereby providing the foundational knowledge for the practice of medicine and facilitating the incorporation of the new scientific knowledge thorough out the medical career. To accomplish this end, the goals of the

Normal Body component are to ensure that all students possess a conceptual model of the structure and integrated function of the human body (as an intact organism) and each of its major organ systems, emphasizing their role in the maintenance of the body's homeostasis. Credit. TBD. *Cartmill*

**INTERDIS-102B. BODY AND DISEASE.** This core course is presented from February through June of the first year. The course begins with fundamental principles of the four basic sciences most directly related to human disease: immunology, microbiology, pathology and pharmacology. This component is followed by an integrated presentation of the most common human diseases organized sequentially by organ system. Teaching modes include lectures, a variety of small group activities guided by faculty, and clinically-oriented disease workshops. Credit: 20. *Nadler, Dawson, Hulette and Mitchell*

**INTERDIS 103B. NEUROBIOLOGY AND HUMAN BEHAVIOR.** The goal of Neurobiology and Human Behavior is to present the scientific principles underlying the structure and function of the human nervous system as well as their dysfunction in certain neurological disorders. This course thus provides foundational knowledge for the practice of medicine and will facilitate the incorporation of new scientific knowledge throughout the medical career. Additionally, topics in normal and disordered human behavior will be incorporated into the curriculum to promote initial awareness of their anatomical and physiological substrates. Core material is presented through a synergistic combination of didactic lectures, scientific readings, laboratory exercises, and clinical case problem-solving. Credit: 4. *Platt and Adamson*

**INTERDIS-105B. PRACTICE YEAR 1.** The Practice courses are required in years one, two, and three. Practice emphasizes clinical skills development using lecture and small group teaching, and outpatient clinical work. In year one, Practice introduces students to interviewing and physical diagnosis skills with emphasis on the doctor/patient relationship. Practice uses written assignments, problem-based learning, video-taping, group discussion to meet course goals. Students practice interviewing and counseling on the wards and with standardized patients. In the spring of year 1, students work with preceptors in outpatient clinics and on the wards to practice their new skills. Fall, Credit: 1. Spring, Credit: 2. *Sheline, McLeod, and Dell*

**INTERDIS-110B. GLOBAL HEALTH.** This unique course brings together some of the outstanding professors from across Schools and Departments at Duke University to address issues of Global Health. The course is designed to provide students with multidisciplinary theories and techniques for assessing and addressing infectious, chronic, and behavioral health problems in less wealthy areas of the world. The course will address global health issues from the disciplines of: epidemiology; biology; medicine; nursing; law; ethics; policy; psychology; sociology; anthropology; environment; engineering; that represent major disease burden overview of public health, focusing on the prevention of diseases and health problems. After a brief review of public health history and epidemiologic methods, we will discuss organizational structures and their roles in defining, preventing and managing public health problems. We will explore selected health problems or issues from a health services research perspective, and discuss their health policy implications. C-L PUBPOL 264.01 Credit: 0. *Whetten*

**INTERDIS-155B. MEDICAL SPANISH ELECTIVE.** The Medical Spanish Elective (MSE) offers 2 hours per week of medical Spanish language classes to first year Duke Med students. Students are stratified based on incoming language level assessed during a phone entrance interview during the summer. In addition, course participants volunteer for a minimum of 10 hours in the Latino community in Durham and attend 4-5 lectures about Latino health issues with UNC medical students who are interested learning about the language and culture of the growing Latino community which makes up a substantial portion of the patient population of Durham and the United States. No credit. *Clements*

## Required

**INTERDIS-205C. PRACTICE YEAR 2.** During year two, students use the Practice course to reflect on their experiences on the clinical rotations. Discussion topics include ethics, suffering, spirituality, pain, professionalism, and end of life issues. Fall, Credit: 1. Spring, Credit: 1. *Sheline, McLeod, and Dell*

**INTERDIS-305C. PRACTICE YEAR 3.** A continuity ambulatory (outpatient) care experience, the course is required of most third year students and is designed to teach students patient outcomes

over time. Study away and scholarship students who may not be able to take the course in their third year must take its equivalent in their fourth year. The outpatient clinic experience is 34 weeks, one-half day a week. Twenty-two weeks are required in an approved continuity ambulatory site, primary care sites being the most likely to be approved. Specialty care sites (medicine or surgery) may be approved, if at least 50 percent of the patients are seen on a continuing basis with typical follow-up in 1-3 months. Approval for this is required by the Practice office. Students may arrange to use 12 of the 34 weeks to pursue non-continuity outpatient clinic experiences (e.g., specialty clinics that do not see patients back before three months, if at all). Notification of the Practice office is required prior to starting, and attendance must be documented by the preceptor. A student may choose to do all 34 weeks at the same approved site. Credit: 1.5. Enrollment: max 100. *Sheline*

### Required 4th Year Course

**INTERDIS-450C. CAPSTONE.** This mandatory course for all fourth year medical students will provide important information and tools to prepare medical students for their first year of residency. Topics will address such issues as compassionate, appropriate, and effective patient care: medical knowledge about established and evolving biomedical and clinical, and cognate sciences as well as practical tips for when you are "on-call" as an intern; interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals; professionalism relative to responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population and systems-based practices that demonstrate one's awareness of and responsiveness to the larger context and system of health care. As part of this course, medical students will participate in a BLS and ACLS provider course. Credit: 4. Enrollment Max. 100. *Promes*

### Basic Science Electives

**INTERDIS-307B. 20TH CENTURY AMERICAN MEDICINE.** This course in medical history will examine how some of the major trends in American medicine in the twentieth century have changed the doctor-patient relationship. Topics will include: technology, therapeutics, practice organization, genetics, and changing patterns of disease. Credit: .5. Enrollment: min 1. *English*

**INTERDIS-308B. ABORTION IN AMERICAN CULTURE.** Few issues have cleaved American society as deeply as abortion. This seminar explores the American experience with abortion--before and after Roe v. Wade--examining issues of religion, politics, law, medicine, gender, and ethics. We will study aspects of fertility and family planning, the experiences of women both as abortionists and undergoing abortions, unwed mothers, teenage pregnancy and young parenthood, and the rise of advocacy groups in favor of and opposed to abortion. The seminar will draw also from the practices of Britain, Europe, and Japan. Credit: .5. Enrollment: min 1. *English*

**INTERDIS-309B. MEDICINE BEFORE 1900.** This course in medical history will explore the history of medicine before the twentieth century. It will include discussions of ancient, medieval, and Renaissance medicine as well as the origins of scientific medicine in the eighteenth and nineteenth centuries. A major part of this course will be using the Josiah Charles Trent Historical Collection of Rare Medical Books. Credit: .5. Enrollment: min 1. *English*

**INTERDIS-310B. 20th CENTURY EPIDEMICS.** This course in medical history will explore some of the major "plagues" of the twentieth century. Included will be influenza, polio, rheumatic fever, heart disease, cancer, anorexia nervosa, shell shock, and AIDS. Credit: .5. Enrollment: min 1. *English*

**INTERDIS-320B. EVIDENCE-BASED MEDICINE JOURNAL CLUB.** EBM Journal Club is offered for third year medical students interested in the clinically relevant practice of evidence-based medicine skills. Six sessions will be offered. Each session will use one or two real research articles as the basis for discussion with faculty regarding research methodology and validity in terms of evidence-based medicine and/or statistical methods. Four sessions will be held every other week beginning in January, and the last two sessions will be held in May. Attendance at four sessions is required to have it noted on the transcript. There will be no make-up sessions. No Credit. Min 5. Max 30. *Gagliardi*

### 4th Year Clinical Science Electives

**INTERDIS-422C. EXPLORING MEDICINE: CROSS-CULTURAL CHALLENGES TO MEDICINE IN THE 21ST CENTURY.** The purpose of this course is to promote understanding the

cultural background of the people of Latin America (particularly Honduras) and how that impacts the delivery of medical care. The course content is designed to facilitate understanding how art, history, literature, music, geography, ethics and religion influence the practice of medicine in the Latin American Culture. The Classes will be given by multidisciplinary faculty from Duke and UNC. Medical Spanish instruction is included in each class to facilitate understanding the culture and facilitate encounters with Hispanic patients in our own environments as well as in Honduras. The course will be held as a 2 hour seminar for 10 weeks (begins in January) with the trip to Honduras as an optional laboratory experience. There will be 20 hours of instruction. Credit: 1 Enrollment - up to 20 students. *Clements*

**INTERDIS-423C. HONDURAS TRIP.** A 10 day trip to Honduras is planned for beginning the end of March with approximately 15 students invited. Interdis 422C is a prerequisite for this trip. A certain number of students with Spanish fluency are needed for the trip. Those traveling to Honduras will meet Honduran students and faculty as well as provide medical care to patients during the visit. A trip to Copan and an indigenous Mayan community is also planned. Permission of the instructor is required for the trip. Credit 1. Enrollment up to 15. *Clements*

**INTERDIS-424C. HEALING /DEVELOPING WORLD AND CARE OF THE UNDERSERVED.** 'Healing in the developing world and care of the underserved' is a course that evolved out of a local community ministry called Family Health Ministries, Inc. (www.familyhm.org). In 1997, Duke Students asked members of Family Health Ministries to take them Haiti. Then they asked us to help them prepare for the trip and finally they asked to get course credit for the time that they spent preparing for the trip. Hence, faculty members from the medical and divinity schools are now involved and IND304C and WXTIAN211 were born. This course is part of the medicine & theology curriculum. Undergraduate, medical, PA, nursing and divinity students have all participated. This is a course that developed out of student interest and demand. What will you get out of this class if you participate? Our goal is the change the way you think. You might look at the world differently. You might have your life radically changed in a positive way? Have you ever had instructors that encouraged you to think outside of the box? For many of us, the course content has radically changed the way that we think and interact with others in our daily lives. The lessons taught in the course are those that we learned from the poorest, uneducated people in this half of the world. The course encourages students to put stereotypes aside and to find educational resources in places where resources are scarce. Education can occur in a classroom or on the street. Some of life's greatest lessons come from solving problems. People in developing countries deal with problems that we can not fathom. In this course, you will come in contact with those people and learn from them. Credit: 2. *Walmer (Med) and Berger (Divinity)*

**INTERDIS-475C. CLINICAL EXPERIENCE.** This course is designed for students that elect to explore clinical experiences while enrolled in other programs such as the MST program. *Staff*

## MEDICAL GENOMICS

### Basic Science Elective

**MGP-308B. INTRODUCTION TO PROTEOMICS.** This course introduces the platform technologies and computational methodologies for protein profiling and interaction analysis. The platform technologies to be covered include mass spectroscopy, 2D gel electrophoresis, surface plasmon resonance, protein arrays and flow cytometry. Structural biology and high throughput screening methods will also be discussed. Prerequisite: Permission of instructor. C-L: CRP 255, MGP 208. Credit: 1. Enrollment: min 10, max 50. *Kontos and staff*

## MEDICINE

### Required Course

**MEDICINE-205C. MEDICINE (DUKE/DURHAM REGIONAL/VAMC)..** During the second year clerkship in medicine, students each will be assigned two four-week blocks to a team taking care of patients on the Internal Medicine Wards at Duke Hospital, Durham Regional Hospital or the Durham Veterans Administration Hospital. The Internal Medicine Clerkship is an opportunity for the student to consolidate knowledge from the first year and apply it to the study of his or her "own" patients. Functioning within teams consisting of an intern, a resident, and an attending allows students to

observe, practice, acquire, and refine basic humanistic and clinical skills while acquiring some of the factual information used in the practice of medicine. Since it is not possible to systematically cover the vast body knowledge comprising Internal Medicine during an eight-week rotation, students are assigned patients to evaluate and follow; these patients become representative learning experiences in a case-study model. Goals of the Medicine clerkship are to teach a method of patient evaluation and care and to provide a firm foundation in medical problem-solving that will be helpful throughout the student's future career. Specifically, students are expected to: (1) Perform and record a complete history and physical examination on each patient they admit. (During the first four weeks, this should be a minimum of two patients per week; thereafter, at least three patients per week). (2) Discuss their plan(s) for the evaluation and care of the patient after the resident has also assessed the patient, with both returning to the bedside to resolve any discrepant historical or physical examination findings. (3) Place a complete written work-up including analysis of primary data (e.g. peripheral blood smear, urinalysis, sputum gram stain, ECG, etc.) on the chart by 8:00 a.m. the next day. It is important during the clerkship to learn to evaluate primary data in a timely fashion. (4) Take primary responsibility for the care of their patients, following them daily, writing progress notes in the chart, keeping track of what has happened to their patients since last seen, and having a good understanding of the rationale for and outcomes of all diagnostic tests and therapeutic interventions. (5) Participate in various diagnostic/therapeutic procedures (e.g., phlebotomy, lumbar puncture, thoracentesis, paracentesis, arthrocentesis, arterial blood gas drawing, placement of intravenous lines) and perform these procedures under appropriate supervision. (6) Preround, or see each of their patients on a daily basis before morning work rounds, review what has happened since last seen, formulate a preliminary plan of care and treatment for each patient and then present these formulations to their ward teams during morning work rounds. (7) Prepare for their bedside case presentations by reading, at a minimum, relevant sections in a standard textbook of medicine. (8) Present their patients to an attending physician within 24 hours of admission, knowing all pertinent medical information as well as the rationale for their ongoing plan(s) for care and evaluation. (9) Not miss any attending rounds without prior permission from their attending physician. (10) Attend all Chair's Conferences, Physical Diagnosis Teaching Rounds, Medical Grand Rounds, and the Student Lecture Series, and other site-assigned teaching activities/conferences unless urgent ward duties preclude doing so. Methods of evaluation: During week four and week eight, a grading committee composed of the resident(s) and the attending physician(s) with whom the student has worked, the Chief/Assistant Chief Medical Resident and the Course Director meet and evaluate each student based on the standard course evaluation form, a copy of which is posted on the Blackboard website and is distributed to each student during the initial orientation to the clerkship. At the end of the clerkship, students will take the NBME Medicine Clerkship written exam and a practical exam on focused problems using four standardized patients (mini-CPX exam). The final grade is a weighted average of the midterm and end of clerkship grading sessions (80percent), the NBME written exam (10percent) and the mini CPX exam (10percent). Weight: 8. *Gagliardi and staff*

## 2nd Year Selectives

**MEDICINE-221C. A TASTE OF PALLIATIVE CARE.** Palliative care focuses on helping patients and their families achieve the best quality of life, regardless of the length of life. Attention to suffering, excellent symptom management, and compassionate communication skills are paramount. Students will have the opportunity to observe and work alongside various palliative care practitioners in community, inpatient, outpatient and hospice settings. The importance of multi-disciplinary teamwork will be emphasized. Concepts to be explored include common fears and challenges that terminally ill people face, biopsychosocial models of care, palliative care symptom management, the family interface, grief, and bereavement. *Elbert-Avila*

**MEDICINE-223C. GASTROENTEROLOGY SELECTIVE.** In order to expose students to the field of Gastroenterology, students will rotate on two services. Students will spend on week on the Gastroenterology Consult Service at Duke Hospital or at the Durham VA Medical Center. On these services, students will perform inpatient consults and be able to see a variety of general gastroenterology procedures. Students will also spend one week on the Biliary Service at Duke. Students will see patients with biliary disorders and be able to see ERCP and endoscopic ultrasound procedures. *Muir and Staff*

## 2nd Year Clinical Electives

**MEDICINE-252C. CLINICAL DERMATOLOGY.** The elective in clinical dermatology is designed to prepare students to perform an accurate skin examination, formulate appropriate differential diagnoses, and choose relevant diagnostic or therapeutic interventions. This course is valuable to any student interested in improving their ability and confidence in the cutaneous exam. Students in the rotation spend two weeks working in the outpatient dermatology clinics, one week on the inpatient consult service at Duke, and one week at the Durham VA Medical Center. The outpatient clinical experience includes general dermatology clinics as well as a variety of specialty clinics such as pediatric dermatology, HIV dermatology, cutaneous oncology; clinic attendance can be tailored to the student's future career goals. Patient care is supplemented with lectures designed to provide the student with a foundation in dermatologic principles, and students are encouraged to attend weekly departmental teaching conferences. Student evaluations are based on the development of clinical skills as assessed by faculty and residents, and by a brief clinically oriented examination. Students are to report to the Dermatology Clinic, Duke South, Purple Zone, Clinic 3K, Room 3337 at 8:30 a.m. on the first day of the rotation for orientation. Dr. Prose is the course director and may be reached at 684-5146. Credit: 4. Enrollment: max 4. *Prose*

**MEDICINE-253C. TUTORIAL IN MEDICAL PDC (Subspecialty Clinics).** (1) Course Goals: Primary-To broaden student exposure to ambulatory care in internal medicine and allow students to work intensively with a single, seasoned medical practitioner. Students learn the informational content relevant to the discipline, but also have the opportunity to observe how one doctor goes about daily practice. (2) How Goals Are Achieved: Students work in a one-to-one relationship with a faculty member in the Department of Medicine who sees patients regularly in the Private Diagnostic Clinic. Students evaluate patients and develop plans for treatment and follow-up under the guidance of the preceptor. Students may follow patients admitted to the hospital. Students may select preceptors from any of the medical subspecialties. (3) Methods of Evaluation: On a regular basis, the preceptor will observe student interactions with patients noting the quality of that interaction as well as the resulting evaluation, including the assessment/differential diagnosis as well as plans for further evaluation, treatment, and follow-up. A copy of the evaluation form will be provided to students at the beginning of their tutorial. Prerequisites: Students must prearrange their elective with an individual preceptor and communicate the preceptor's approval to Dr. Jane Gagliardi (via email: Gagli001@mc.duke.edu) at least two weeks prior to the start date of the planned tutorial. At the end of the experience, the preceptor will then complete a standard evaluation form. Credits: 1(complete a total of 40 hours; e.g., 10 hours/week for 4 weeks). 2 (complete a total of 80 hours; e.g., 20 hours/week for 4 weeks). 3 (complete a total of 120 hours; e.g., 30 hours/week for 4 weeks). 4 (complete a total of 160 hours, e.g., 40 hours/week for 4 weeks). You may recruit one to four physicians to come up with sufficient clinic time to meet credit requirements. Time missed for purposes of residency interviews beyond two full days of clinic will require make-up sessions or will result in assignment of fewer credits. Prerequisite: Permission of Instructor is Required. Enrollment: max 4. *Gagliardi and Medical PDC staff* . NOTE: Medical students seeking experiences in the PDC with preceptors MUST be explicit in making the preceptors aware that they are second year medical students, especially if they have not yet taken the clerkship in Internal Medicine.

**MEDICINE-254C. CARDIAC CARE UNIT.** 1) Course Goals: Primary - To provide an in-depth experience in the evaluation and care of inpatients with various cardiovascular problems. Secondary -To refine student understanding of the cardiovascular history, physical examination and non-invasive and invasive laboratory testing in evaluating and managing patients with known or suspected cardiovascular disease. (2) How Goals Are Achieved: Students are assigned to the Duke CCU, the VA CCU, or to a cardiology inpatient service at Duke, and, in concert with the house staff, cardiology fellows, and senior staff attendings, work up and manage patients admitted to these various services. They also participate in a core curriculum experience, including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by all resident, fellow, and senior staff with whom they work. The evaluation form is available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the

elective. Prerequisite: Must have successfully completed Medicine 205C prior to enrollment. Credit: 4. Enrollment: max 3. *Waugh and cardiology staff*

**MEDICINE-257C. NEUROLOGY CLERKSHIP.** This course provides the student with a firm understanding of the neurological examination, formulation of clinical neurological problems, and practice with written and oral communications in a hospital setting. The student has the opportunity to apply the neuroanatomy, neurophysiology, neurochemistry, and neuropathology learned in the first year to the evaluation and care of his or her patients. The patients are drawn from the neurology services at Duke Hospital or the Durham VA Medical Center. The students elicit a history and perform a physical examination. The student records the findings in the hospital charts and presents the findings at regular staff rounds. The student then participates with a clinical team of faculty and house officers in the hospital evaluation of the patients. The student is encouraged to participate in all diagnostic procedures such as lumbar puncture. The student has the opportunity to follow patients through neuro-radiological and neuro-surgical procedures forming part of evaluation and treatment. The specific expectations for the student are: (a) to perform and record a competent neurological and history examination on each admitted patient; (b) to be competent in the hospital management of neurological patients including diagnostic evaluations such as hematological and urine evaluations, lumbar puncture and appropriate electrical studies; (c) to assume responsibility as the primary care person for his or her patients; (d) to participate in daily work rounds with an assigned team of house officers and faculty; (e) to be sufficiently knowledgeable to participate in patient care decisions; (f) to attend faculty attending rounds and to present patients to faculty within 24 hours after admission; and (g) to participate in neurology service rounds and conferences during the course. The course includes faculty lectures. A written evaluation is provided to the students by faculty and house staff. There is an examination. Credit: 4. Enrollment: max 10. *Chilukuri and neurology staff*

**MEDICINE-258C. CONSULTATIVE CARDIOLOGY.** (1) Course Goals: Primary - To refine and further develop the skills necessary for eliciting an accurate, complete CV history and for performing an accurate, complete CV physical examination: To refine student understanding of normal and pathologic cardiovascular physiology while functioning in the role of a consultant for inpatients and outpatients with various cardiovascular problems; Secondary - to develop the skills necessary to quickly and accurately interpret ECGs (both 12-lead ECGs and rhythm strips). (2) How Goals Are Achieved: Students are assigned to the consult service at either the VA Hospital or Duke, where, in concert with the resident, fellow and senior staff attending, they evaluate the operative risk for cardiac and non-cardiac surgery as well as make decisions concerning the evaluation and treatment of patients with a wide variety of heart diseases. Students participate in reading ECGs and a core curriculum experience including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by the resident, fellow, and senior staff with whom they work. The evaluation form is made available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the elective. Prerequisite: Must have successfully completed Medicine 205C prior to enrollment. Credit: 4. Enrollment: max 2. *Waugh and cardiology staff*

**MEDICINE-259C. GERIATRIC MEDICINE.** Course Goals: Primary - To enable the student to become familiar with the principles of caring for the geriatric patient. Secondary - To familiarize the student with the physiology and diseases of aging. (2) How Goals Are Achieved: This elective is offered by the interdepartmental faculty of the Division of Geriatric Medicine. The student works with faculty, fellows, and housestaff in a number of settings involved in the care of the geriatric patient. These include the Geriatric Evaluation and Treatment Clinic (Duke), Geriatric Evaluation Unit Clinic (Durham VA), The Forest at Duke Clinic, Extended Care and Rehabilitation Center (Durham VA) and other subspecialty clinics. Principles to be stressed are biology and pathophysiology of aging, multiple clinical problems in the elderly, interdisciplinary team approach to evaluation, planning and treatment, goals of maximal functional achievement and independence for the elderly. Specific clinical problems that students encounter include cognitive disorders, gait instability and falls, urinary incontinence, pressure sores, and chronic pain. Students also learn about the management of common chronic diseases in the elderly, including diabetes mellitus, heart disease, and osteoarthritis. The student participates

actively in the work-up and management of patients work-up in inpatient extended care and outpatient settings to become more familiar with the problems of the elderly in the community. Familiarity with the growing literature in geriatric medicine is encouraged. The student participates in seminars, lectures and team meetings at the appropriate sites. (3) Methods of Evaluation: Evaluation is by consensus of instructors and fellows at the various training sites. It is based on discussions and presentations throughout the course period. Credit: 4. Enrollment: max 1. *Twersky and staff*

**MEDICINE-261C. INTRODUCTION TO ADVANCED GENERAL MEDICINE (DUKE, VA , DRH).** (1) Course Goals: To gain additional knowledge regarding inpatient internal medicine. Primary - To provide additional experience in the management of hospitalized patients with a wide variety of general internal medical problems. Secondary - To develop a comprehensive understanding of the pathophysiology of the common problems encountered on an internal medicine inpatient service. (2) How Goals Are Achieved: Students are assigned to one of the general medical wards at Duke Hospital, Durham Regional Hospital or the Durham VA Medical Center. They are assigned patients on the service and are expected to perform and complete an initial evaluation, develop a care plan, formulate and write admission orders (to be countersigned by the intern), present the patient at teaching rounds, and follow the patient throughout the hospital course. Students are assigned two patients per call night and will follow up to six patients at a time. Students who have not yet rotated on General Medicine will start out admitting one patient per call night and will advance as the elective progresses. Outside reading on each patient is expected. Credit: 4 Enrollment: Max 16. *Gagliardi and Staff*

**MEDICINE-265C. CLINICAL INFECTIOUS DISEASES.** 1) Course Goals: To provide experience in the clinical and laboratory diagnosis of infectious diseases and in their therapy. The primary emphasis is placed on learning from interaction with patients, resident staff, and faculty on the consultation service. Students are expected to work up assigned patients by interview, physical examination, and collation of laboratory results, leading to a summary and synthesis of the problem. Particular emphasis is placed on close follow-up of the patients during hospitalization, including attendance at procedures or operations whenever possible. Students should know their own patients well enough to be able to give a reasonable presentation on ward rounds or at conferences without notice. Students are expected to read standard texts in-depth about their patients' problems, as well as a few recent relevant primary references. Students are expected to attend the various conferences listed on the weekly schedule of division activities punctually, including Microbiology Plate Rounds, Journal Club, and tutorials. They are asked to present cases and provide some discussion at the Thursday V.A. Conference. Each student should be prepared to present and briefly discuss articles that he or she considers to be interesting and timely at Journal Club. (2) Methods of Evaluation: Each student's performance is evaluated and graded by the resident, fellow, and attendings, using the usual honors, pass plus, pass, deferred, or unsatisfactory system that is utilized internally in the Department of Medicine. In arriving at a consensus, appropriate emphasis is placed on knowledge, enthusiasm, and evidence of improvement during the rotation. There is no written examination. Adds are accepted at any time providing the course has not been filled. However, because this course is usually oversubscribed, drops are not accepted within 30 days of the first day of classes unless the student finds her or his own replacement. MEDICINE 440C is a full-time experience. Also, it is offered as a sole-enrollment course and, as such, cannot be taken in conjunction with any other course without the permission of the advisory dean and the course director. Credit: 4. Enrollment: max 7. *Hamilton and infectious diseases staff.* Sole Enrollment

## 4th Year Clinical Electives

**MEDICINE-401C. INTERNAL MEDICINE SUBINTERNSHIP (DUKE/VA).** Course Goals: To provide an internal medicine inpatient care experience at the intern level. (2) How Goals Are Achieved: Students are assigned to an inpatient service at Duke, the Durham VA, or Durham Regional Hospital. These services include the general medicine services at both hospitals, and internal medicine residents supervise the students. Alternative services include the MICU, Cardiology, Hematology/Oncology, and Pulmonary. Internal medical residents and subspecialty fellows provide supervision on these services. The student functions as an intern on that service with the exception that orders must be countersigned by a medical house officer. Sleep-in facilities are available. The supervising resident or fellow determines the number of patients assigned with anticipated increases over the four weeks. (3)

Methods of Evaluation: Students are evaluated by their residents, fellows, and senior staff attending. The evaluation form is made available to each student at the beginning of the rotation. There is a formal evaluation at four weeks. No final exam is given. Prerequisites: permission of instructor. Credit: 5. Enrollment: max 17. *Muir and staff*

**MEDICINE-402C. MEDICAL SUBINTERNSHIP IN HEMATOLOGY-ONCOLOGY.** (1) Course Goals: This is an intensive experience in the care of inpatients with serious hematologic and oncologic disorders. The student learns to interpret peripheral blood films, how to use and interpret other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), and how to approach the evaluation and treatment of hematologic and solid tissue malignancies and their complications. (2) How Goals Are Achieved: Under supervision of a Hematology/Oncology fellow and a division staff member, the student is given considerable responsibility in the care of inpatients on one of the Hematology/Oncology or Experimental Therapeutics wards in Duke North. They receive instruction and guidance in performing diagnostic and therapeutic procedures and gain experience in the use of chemotherapeutic drug regimens. Specific issues such as quality of life, care of the aging patient with malignancy, and decisions regarding DNR status are addressed by the patient-care team. In addition, students receive a series of core lectures, receive training in chemotherapy, and attend the ongoing clinical, research and didactic divisional conferences. (3) Methods of Evaluation: Students are evaluated by their preceptors on the basis of their ability to obtain a history, perform a physical examination, evaluate hematologic and other laboratory data, and propose assessments and plans of action. Prerequisite: Approval of the faculty based on prior performance. Credit: 5. Enrollment: max 4. *Kane and hematology/oncology staff*

**MEDICINE-403C. NEUROLOGY SUBINTERNSHIP.** (1) Course Goals: To provide a neurological patient care experience at the intern level. Students have the opportunity to apply neurological examination skills learned in the second year to direct patient care situations. Students are exposed to a variety of neurological problems, procedures, and therapies. This course is recommended for the student interested in neurology, psychiatry, internal medicine, neurosurgery, neuropathology or ophthalmology. (2) How Goals Are Achieved: Students are assigned to the Duke or Durham VA Hospitals' neurology ward and take call in rotation with a medical intern as part of a patient care team. Students attend Neurology-Neurosurgery Grand Rounds, Neurology Subspecialty Conferences and participate in all ward activities. Full time participation is expected. (3) Methods of Evaluation: Resident and staff physician provide a written evaluation and grade. Credit: 5. Enrollment: min 1, max 1. (more than one with course director's approval). *Chilukuri and neurology staff*

**MEDICINE-404C. CARDIAC CARE UNIT SUBINTERNSHIP.** (1) Course Goals: Primary - To provide an in-depth experience in the evaluation and care of inpatients with various cardiovascular problems. Secondary -To refine student understanding of the cardiovascular history, physical examination and non-invasive and invasive laboratory testing in evaluating and managing patients with known or suspected cardiovascular disease. (2) How Goals Are Achieved: Students are assigned to the Duke CCU, the VA CCU, or to a cardiology inpatient service at Duke, and, in concert with the house staff, cardiology fellows, and senior staff attendings, work up and manage patients admitted to these various services. They also participate in a core curriculum experience, including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by all resident, fellow, and senior staff with whom they work. The evaluation form is available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the elective. Prerequisite: none. Credit: 5. Enrollment: max 3. *Waugh and cardiology staff*

**MEDICINE-405C. INTENSIVE CARE MEDICINE SUBINTERNSHIP (DUKE).** Course Goals: (1) Primary - To introduce the student to a pathophysiologic approach to critically ill adults. Secondary - To provide an opportunity for students to perform selected procedures. (2) How Goals Are Achieved: Students function as subinterns in a very active intensive care unit. Patient evaluations, procedures, diagnostic planning and treatment planning are performed by students under the direct supervision of the junior assistant resident, critical care fellow, and attending physician. Night call occurs every third night. Regular didactic lectures on topics related to the diagnosis and treatment of the criti-

cally ill are given by the attending staff. The physiological and biochemical approach to critical care medicine is stressed. A syllabus of selected reprints from the critical care literature is provided to each student. Emphasis is placed on access to attending physicians and critical care fellows for the discussion of specific patient oriented questions. Preferences for the month of rotation are honored, if possible. Questions should be directed to Dr. Govert, 681-5919. (3) Methods of Evaluation: Each student's performance is assessed by the unit director through direct observation of the student in the clinical and didactic environments. Input from the residents, fellows, and other attending physicians is also obtained. Prerequisites: permission of instructor for all summer sections and fall sections 41 and 42. Credit: 5. Enrollment: max 3. *Govert and critical care staff*

**MEDICINE-406C. INTENSIVE CARE MEDICINE SUBINTERNSHIP (DURHAM VA HOSPITAL).** (1) Course Goals: Primary - To provide training in clinical physiologic and pharmacologic principles of the care of the critically ill. Secondary - To develop students' skills in performance and interpretation of diagnostic procedures. (2) How Goals Are Achieved: Under the supervision of senior assistant residents, the pulmonary fellow and the critical care attending physician, students function as subinterns and are responsible for patient work-ups and daily bedside presentations. Students are given responsibilities for procedures and decision-making in direct proportion to the development of their patient management skills. Daily radiology and bedside attending rounds stress an integrated physiologic approach to the management of critically ill patients with emphasis on acute respiratory care, hemodynamic monitoring, acid-base balance and nutritional support and end-of-life care and issues. Each student is provided a handout of selected readings that supplements the didactic sessions on diagnosis, pathophysiology, and management of critical illness. The student on call schedule is every third night for the duration of this four-week course. The student registered for MEDICINE 406C may drop the course up to one month before the start date. After that time, the student must arrange for a replacement if he/she subsequently drops the course. (3) Methods of Evaluation: Student evaluations are done by the fellows and faculty attending on the MICU and are based on observed performance. Credit: 5. Enrollment: max 3. *McMahon and critical care staff*

**MEDICINE-413C. TUTORIAL IN MEDICAL PDC (Subspecialty Clinics).** (1) Course Goals: Primary-To broaden student exposure to ambulatory care in internal medicine and allow students to work intensively with a single, seasoned medical practitioner. Students learn the informational content relevant to the discipline, but also have the opportunity to observe how one doctor goes about daily practice. (2) How Goals Are Achieved: Students work in a one-to-one relationship with a faculty member in the Department of Medicine who sees patients regularly in the Private Diagnostic Clinic. Students evaluate patients and develop plans for treatment and follow-up under the guidance of the preceptor. Students may follow patients admitted to the hospital. Students may select preceptors from any of the medical subspecialties. (3) Methods of Evaluation: On a regular basis, the preceptor will observe student interactions with patients noting the quality of that interaction as well as the resulting evaluation, including the assessment/differential diagnosis as well as plans for further evaluation, treatment, and follow-up. A copy of the evaluation form will be provided to students at the beginning of their tutorial. Prerequisites: Students must prearrange their elective with an individual preceptor and communicate the preceptor's approval to Dr. Jane Gagliardi (via email: Gagli001@mc.duke.edu) at least two weeks prior to the start date of the planned tutorial. At the end of the experience, the preceptor will then complete a standard evaluation form. Credits: 1(complete a total of 40 hours; e.g., 10 hours/week for 4 weeks). 2 (complete a total of 80 hours; e.g., 20 hours/week for 4 weeks). 3 (complete a total of 120 hours; e.g., 30 hours/week for 4 weeks). 4 (complete a total of 160 hours, e.g., 40 hours/week for 4 weeks). You may recruit one to four physicians to come up with sufficient clinic time to meet credit requirements. Time missed for purposes of residency interviews beyond two full days of clinic will require make-up sessions or will result in assignment of fewer credits. Prerequisite: Permission of instructor is required. Enrollment: max 4. *Gagliardi and Medical PDC staff* .

**MEDICINE-414C. INTRODUCTION TO OUTPATIENT PRIMARY CARE INTERNAL MEDICINE.** Course Goals: At the end of the experience, students should be able to 1) Diagnose and manage a number of common internal medicine and primary care problems including a wide variety of diseases that are generally seen only in the ambulatory setting 2) Competently and efficiently take a problem-focused history, perform a directed physical exam and perform some office-based proce-

dures. How Goals Are Achieved: The student works with one or more faculty preceptors within the Division of General Internal Medicine spending one or more days per week seeing patients at the Duke Health Centers and/or Lincoln Community Health Center and the Durham VA Medical Center. A highly diverse mix of patients is seen and might include persons with diabetes, heart disease, orthopedic conditions, skin disease, common mental health problems, or neurologic disease. Patients also present for preventive health services. In the DGIM practice, patients routinely present with symptoms that have not been previously evaluated or diagnosed, allowing students to truly sharpen their clinical skills. In all cases, the student sees the patient first then discusses the case with the attending. The student must outline in writing five goals that he or she wishes to accomplish during this rotation. The student's goals should be delivered to Dr. Jane Gagliardi or course coordinator, Shelia Blackley at least three weeks before the rotation begins. Methods of Evaluation: The faculty preceptor who works directly with the student does the student evaluation. Grades are based on the student's interactions with patients, his or her clinical thinking regarding diagnosis and management of their problems, and documented records. Professionalism, fund of knowledge, and commitment to learning are highly weighted. Prerequisites: Third year and fourth year students who have successfully completed the second-year medicine clerkship. Credit: 1 (10 hrs/wk for 4 weeks) or 2 (20 hrs/wk for 4 weeks). Enrollment: max 2. (*Gagliardi and general internal medicine staff*). For questions regarding this course, please contact Shelia Blackley at 668-0672 or black015@mc.duke.edu.

**MEDICINE-415C. CLINICAL MANAGEMENT OF OBESITY.** The epidemic of obesity in the United States demands a course for medical students that helps them understand the underlying biochemical, pathophysiology and treatment options. Every physician who practices in the 21st century should have a basic knowledge of the principles of human nutrition and their application to a wide variety of clinical problems. This four-week interdisciplinary elective under the direction of the Stedman Nutrition Center is a collaboration between the Departments of Medicine, Pediatrics, Family Medicine, and Surgery. This elective provides the students with an opportunity to learn about a clinical approach to obesity management, including metabolic and pathologic consequences of being overweight and the relationship to the following chronic disorders: hypertension, insulin resistance, and dyslipidemia. The student will learn about cellular signaling mechanisms that influence obesity by attendance at basic science seminars at the Stedman Nutrition Center. Students will learn to counsel/motivate patients to make informed nutritional decisions consistent with adopting and maintaining a healthy lifestyle and with establishing appropriate dietary, exercise and behavioral goals. The elective director will approve a student's choice of a mentor. This approval will be based on matching the student's interests with the primary focus of the mentor. The assigned mentor will coordinate the student's experiences throughout the four-week rotation with a focus on clinical applications of obesity management. The program includes the following components: 1. One day of outpatient clinics in the following clinics: Hypertension Clinic, Pediatric Clinic, Diabetes Clinic, Duke Weight Loss Surgery Center, and the Duke Diet and Fitness Center. The focus of the student's experience will be on learning to translate basic science information into clinically relevant principles that guide medical decision-making as they apply to obesity management. (Total clinical time--32 hours) 2. Research and departmental seminars sponsored by the Stedman Nutrition Center (1 hour per week). Students will be expected to participate in and present one seminar reviewing current research in a selected field of Obesity Research. 3. A review paper in a topic area designated by the mentor. Emphasis will be placed on developing skills required to formulate original research proposals in the area of applied clinical research. (1-2 hours of mentoring time per week) Prerequisite: permission of instructor. C-L: COMMFAM 465C, PEDS 465C, SURGERY 465C. Credit: 4. Enrollment: max 1. *Westman*

**MEDICINE-417C. NEUROLOGY CLERKSHIP.** This course is restricted to those students who did not take the Neurology rotation in their second year. It provides the student with a firm understanding of the neurological examination, formulation of clinical neurological problems, and practice with written and oral communications in a hospital setting. The student has the opportunity to apply the neuroanatomy, neurophysiology, neurochemistry, and neuropathology learned in the first year to the evaluation and care of his or her patients. The patients are drawn from the neurology services at Duke Hospital or the Durham VA Medical Center. The students elicit a history and perform a physical examination. The student records the findings in the hospital charts and presents the findings at regular staff

rounds. The student then participates with a clinical team of faculty and house officers in the hospital evaluation of the patients. The student is encouraged to participate in all diagnostic procedures such as lumbar puncture. The student has the opportunity to follow patients through neuro-radiological and neuro-surgical procedures forming part of evaluation and treatment. The specific expectations for the student are: (a) to perform and record a competent neurological and history examination on each admitted patient; (b) to be competent in the hospital management of neurological patients including diagnostic evaluations such as hematological and urine evaluations, lumbar puncture and appropriate electrical studies; (c) to assume responsibility as the primary care person for his or her patients; (d) to participate in daily work rounds with an assigned team of house officers and faculty; (e) to be sufficiently knowledgeable to participate in patient care decisions; (f) to attend faculty attending rounds and to present patients to faculty within 24 hours after admission; and (g) to participate in neurology service rounds and conferences during the course. The course includes faculty lectures. A written evaluation is provided to the students by faculty and house staff. There is an examination. Credit: 4. Enrollment: max 10. *Chilukuri and neurology staff*

**MEDICINE-418C. CLINICAL NEUROLOGY SUBSPECIALTIES.** (1) Course Goals: To provide the student clinical exposure to a specific subspecialty in neurology. (2) How Goals Are Achieved: The student focuses on one specific subspecialty in neurology and attends clinic for 3-8 hours weekly. During that time the student participates in the clinical evaluation of patients with a member of the neurology faculty. Clinical experience in Neuromuscular Diseases, Epilepsy and Sleep Disorders, Cerebrovascular Disorders, Memory Disorders, or Neuro-oncology are available. Appropriate reading material is utilized to complement the clinical experience. MEDICINE 207C or MEDICINE 417C are prerequisites for this course. (3) Method of Evaluation: Standard written evaluation form by faculty supervisor. Approval by the course director in order to ensure access to the desired neurologic subspecialty is required. For permission information, please contact Virginia Chambers at 919-684-4454. Credit: 1-2. Enrollment: max 5 (if participating in different subspecialties). *Chilukuri and neurology staff*

**MEDICINE-419C. CONSULTATIVE NEUROLOGY.** (1) Course Goals: To introduce senior medical students to the diagnostic and treatment issues encountered on the consultative neurology service. (2) How Goals Are Achieved: The student becomes part of the inpatient neurology consultation team either at Duke Hospital or the Durham VA Hospital. This team consists of senior neurology attendings on a rotating basis as well as a neurology and/or medicine house officer. Consultations are performed by the student under the guidance of the house staff and then are presented to the attending on rounds. The student is responsible for performing a neurologic history and physical as well as assisting in the interpretation of all important laboratory data. The student continues to follow the patient's course as required. The student also attends rounds when other patients are presented by the house officers. Appropriate reading material is utilized to compliment the clinical experience. Attendance at Neurology Grand Rounds and various Neurologic Subspecialty Conferences is required. Experience on an inpatient neurology service such as MEDICINE 207C or MEDICINE 417C is a prerequisite for this course. (3) Method of Evaluation: Standard written evaluation by faculty supervisor with house staff input. Credit: 4. Enrollment: max 2. *Chilukuri and neurology staff*

**MEDICINE-420C. ADVANCED GENERAL MEDICINE (DUKE, VA , DRH).** (1) Course Goals: To expand the experience and knowledge gained during the second year medicine clerkship. Primary - To provide additional experience in the management of hospitalized patients with a wide variety of general internal medical problems. Secondary - To develop a comprehensive understanding of the pathophysiology of the common problems encountered on an internal medicine inpatient service. This course is recommended for visiting students and Duke students who receive a grade of straight Pass in MEDICINE 205C. (2) How Goals Are Achieved: Students are assigned to one of the general medical wards at Duke Hospital, the Durham VA Medical Center, or Durham Regional Hospital. They are assigned patients in rotation with the second year students on the service and are expected to perform and complete an initial evaluation, develop a care plan, write the orders (to be countersigned by the intern), present the patient at teaching rounds, and follow the patient throughout the hospital course. Students are initially assigned three to five patients per week and are expected to do outside reading on each. Students may be advanced to the subinternship level during the eight week period at the recom-

mendation of their resident, attending, and chief medical resident. (3) Methods of Evaluation: The evaluation form is made available to each student at the beginning of the rotation. There are formal mid-term and final evaluations. No final exam is given. Prerequisite: permission of instructor. Credit: 10. Enrollment: max 6. *Muir and staff*

**MEDICINE-421C. INTRODUCTION TO CLINICAL RHEUMATOLOGY.** (1) Course Goals: An introductory course in Clinical Rheumatology designed to introduce students to the basics of differential diagnosis in the field of rheumatic disease; to provide more detailed knowledge of the most common, major groups of rheumatic disorders. (2) How Goals Are Achieved: Didactic and interactive lectures are the primary mode of teaching. Handouts and outlines on relevant topics and the Primer of Rheumatic Diseases are provided at the beginning of the course. One or more sessions(s) may be devoted to patient presentations, with several patients available for questioning and discussion. Basic pathophysiology, clinical features, laboratory studies, radiographic findings and pathology correlations are presented. (3) Methods of Evaluation: participation in class and discussion of subject matter in concluding session. Course director evaluates student with standard Duke evaluation. If permitted by the instructor, this clinical course can be audited. Credit: 1. Enrollment: min 3, max 20. *Criscione and rheumatology staff*

**MEDICINE-423C. CLINICAL RHEUMATOLOGY.** (1) Course Goals: Primary - To provide experience in the recognition and care of patients with rheumatic, chronic inflammatory, and immunological diseases, including the various forms of arthritis, connective tissue disease, vasculitis, and metabolic arthropathies. Secondary - To develop skills in the interpretation of specialized laboratory studies relating to the evaluation of patients with rheumatic, immunological, and metabolic disorders. Students are also exposed to joint aspiration and injection, synovial fluid analysis, bone and joint radiology, and histopathological analysis of tissue. (2) How Goals Are Achieved: Students evaluate patients at the Duke and Durham VA Hospitals. Daily rounds are held with faculty, house staff, and students that focus on oral presentation of patients with detailed review of pertinent laboratory, x-ray and pathological findings. Basic Science Conference; Bone and Joint Radiology Conference; Pathology Conference; and Rheumatology and Immunology Grand Rounds are held on a regular basis. Emphasis is placed on a comprehensive approach to the evaluation and treatment of patients with rheumatic, inflammatory, immune and metabolic disorders. Students are assigned primary house officer level responsibilities on the Consultation Service and the Outpatient Clinics at the Duke or Durham VA Hospitals. (3) Methods of Evaluation: Student evaluations are based on their performance on rounds and in the clinics, including history and physical examination skills and outside reading. This is a sole enrollment course and, as such, cannot be taken in conjunction with any other course. Credit: 4. Enrollment: max 2. *St. Clair and rheumatology/immunology staff.* Sole enrollment

**MEDICINE-425C. CLINICAL COAGULATION.** (1) Course Goals: Primary - To teach the clinical and laboratory approach to patients with a hemorrhagic or thrombotic disorders. The student learns to evaluate clinical coagulation disorders and become familiar with coagulation laboratory testing and interpretation. Secondary - To expose the student to recent advances in the area of coagulation research. (2) How Goals Are Achieved: The student spends four weeks on the Hematology Consult Service under the direction of hematology division faculty. The student is expected to work up inpatients with coagulation problems referred to the Coagulation Service as well as participate in a half day a week Coagulation Outpatient Clinic. Patients generally present with complex diagnostic as well as therapeutic problems. The rotation includes Coagulation lab rounds during which the student learns to interpret lab tests and review abnormal results. The student is expected to read standard texts regarding their patients' problems, as well as relevant reviews provided by the attending physician. The student may also interact with the Anticoagulation Management Service to gain a better understanding of various approaches to outpatient management of anticoagulant therapy. Students electing to do an eight week rotation have a more extensive laboratory and clinic research experience. (3) Methods of Evaluation: The student's performance is evaluated by the hematology attending with input from the fellow and/or medicine resident on the service. The evaluation is based on observation of the student's ability to do careful histories and physical examinations, to appropriately assess the problem and develop a logical diagnostic and therapeutic plan, and to demonstrate an increase in knowledge regarding laboratory tests and their application to clinic problems. Credit: 4 or 8. Enrollment: max 2. *Kane and hematology staff*

**MEDICINE-428C. METABOLISM AND ENDOCRINOLOGY.** (1) Course Goals: Primary - The student has an in-depth experience in the evaluation and management of patients with endocrine disorders. Secondary - The student learns basic principles of hormone physiology and applies these concepts in clinical settings. (2) How Goals Are Achieved: Each student is introduced to patient problems by working with the Endocrine faculty (Drs. Brown, Burch, Feinglos, Guyton, Green, Jelesoff, Spratt, Weber, McNeill, Gesty-Palmer, Miranda, Caveney). Prior arrangements may be made with a particular faculty member under the appropriate course number. The student is exposed to clinical endocrine disorders by seeing patients in endocrine outpatient clinics (Diabetes/ General Endocrine, and Durham VA General Endocrine Clinics), as well as experiencing the inpatient Diabetes Management/ General Endocrine Consult Service. The student has the opportunity to review general literature on common endocrinologic conditions and endocrinologic emergencies, as well as learning basic assessment skills of the patient with diabetes, thyroid disease, and other common endocrinologic presentations. Division conferences include Grand Rounds, Case Conference, and Inpatient Consult Rounds with opportunities to integrate basic concepts with clinical applications. (3) Methods of Evaluation: A written critique is provided by the student's preceptors with comments from other members of the division as appropriate. Credit: 4. Enrollment: max 2. *Weber and endocrinology staff*

**MEDICINE-430C. PULMONARY MEDICINE.** Course Goals: (1) Primary - To provide training in clinical aspects of pulmonary medicine. The primary diseases emphasized include asthma, chronic obstructive lung disease, pulmonary vascular diseases including pulmonary embolus, acute respiratory failure, hypersensitivity, interstitial and immunologic lung diseases and pulmonary manifestations of systemic illnesses, i.e., sarcoid, scleroderma, cystic fibrosis, etc. Secondary - To provide experience with pulmonary laboratory techniques including pulmonary function testing, cardio-pulmonary exercise testing, chest radiology, and bronchoscopy. (2) How Goals Are Achieved: Students assigned to the Pulmonary Consult Services at either the Durham VA or at Duke Hospital. They have primary responsibility for workup and presentation of selected patients on these services. All patients are presented and followed at daily rounds with fellows and faculty. Students also participate in a half-day outpatient clinic each week. Joint seminars and conferences involving both the Duke and Durham VA Consult Services are held each week to provide instruction in pulmonary function evaluation, pulmonary physiology, chest radiology, pulmonary pathology and clinical pulmonary medicine. (3) Methods of Evaluation: Student evaluations are done by fellows and faculty assigned to the Consult Services during the period of the course and are based on observed performance. Questions should be directed to Patti Streicher, 668-0380. Credit: 4. Enrollment: min 1, max 4. *MacIntyre and pulmonary staff*

**MEDICINE-434C. OUTPATIENT HEMATOLOGY-ONCOLOGY (DUKE OR DURHAM VA).** (1) Course Goals: To give the student experience in the diagnosis, long-term treatment, and supportive care of patients with hematologic and oncologic disorders in the outpatient setting. The use and interpretation of peripheral blood films and other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), as well as an approach to the evaluation and treatment of common hematologic problems (anemias, bleeding and clotting disorders, hematologic and solid tissue malignancies) are included. Issues such as quality of life and care of the geriatric oncology patient are addressed. (2) How Goals Are Achieved: The student is assigned a staff member as preceptor with whom to work in the Hematology/ Oncology clinic one to three half- days per week in clinic, depending on the student's schedule and the availability of physicians in clinic. Alternatively, the student may work with several preceptors in the Hematology/Oncology clinic for five full days per week during a four week block. If desired, preceptors who concentrates mainly on hematology or oncology may be arranged. This course is offered for 4, 8, or 16 weeks. (3) Methods of Evaluation: Students are evaluated by their preceptors on the basis of their ability to obtain a history, perform a physical examination, evaluate hematologic and other laboratory data, and propose assessments and plans of action. Credit: 1-4. Enrollment: max 4. *Kane and hematology/oncology staff*

**MEDICINE-435C. GASTROENTEROLOGY.** (1) Course Goals: Primary - To provide an experience with digestive diseases from which the student can develop a sound fundamental approach to the diagnosis and management of these problems. Secondary - To provide an exposure to recent advances in the field including therapeutic and diagnostic endoscopy; to stimulate questions concerning

digestive diseases and to attract students into the field. (2) How Goals Are Achieved: Participation in the evaluation and management of patients hospitalized at Duke or the VA Hospital under the guidance of the resident, fellow, and faculty members assigned either to the VA or Duke Consultation Service. The students' experience will include performing and presenting an appropriate history, physical exam and assessment of patients referred to the Consult Service,. and, where appropriate, data from the relevant literature. Students will also participate in the activities of the GI endoscopy unit. This unit offers specialized tests and/or procedures necessary for the state of the art care of patients with digestive diseases. Procedural activities include upper endoscopy, endoscopic retrograde cholangiopancreatography, colonoscopy, polypectomy, endoscopic ultrasound, laser photodynamic therapy, and endoscopic papillotomy of the ampulla of Vater. Data derived from these and other laboratory studies are discussed in the context of specific patient problems in weekly conference settings. Students have an opportunity to interact with members of the faculty of the Division at morning rounds and other conferences where patients from each of the services (Duke and VA) are discussed. (3) Methods of Evaluation: Student evaluation forms are completed by the resident, fellows, and faculty working with the student on individual patient care services. Final evaluation represents a composite of these forms that chiefly identifies clinical skills, fund of basic information, organizational ability, and degree of interest and participation. Credit: 4. Enrollment: max 4. *Muir and staff*

**MEDICINE-436C. LEGAL AND ETHICAL ISSUES IN MEDICINE.** This seminar examines legal and ethical questions raised by modern medical practice with special attention to their implications for clinicians and their patients. It includes historical and philosophical analysis of these questions as well as coverage of selected practice-related issues (e.g., truth-telling, confidentiality, informed consent, refusal of treatment, the rights of adolescent patients, and reproductive issues). Credit: 1. Enrollment: min 6, max 12. *Holder*

**MEDICINE-438C. CLINICAL HEMATOLOGY AND ONCOLOGY (DUKE OR DURHAM VA).** (1) Course Goals: Students learn how to interpret peripheral blood films, how to use and interpret other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), and how to approach the evaluation and treatment of common hematologic problems (anemias, bleeding and clotting disorders, hematologic and solid tissue malignancies). (2) How Goals Are Achieved: Students receive a series of core lectures, gain familiarity with chemotherapy regimens and administration, and attend the ongoing clinical, research, and didactic divisional conferences. Clinical duties include the performance of inpatient consults under the supervision of a fellow and staff member. This course may be taken for four or eight weeks. (3) Methods of Evaluation: The students are expected to perform and present initial evaluations of consult cases including peripheral blood film on daily rounds, and to perform limited literature searches and evaluations of chosen clinical topics. Credit: 4 or 8. Enrollment: max 4. *Kane and hematology/oncology staff*

**MEDICINE-440C. CLINICAL INFECTIOUS DISEASES.** (1) Course Goals: To provide experience in the clinical and laboratory diagnosis of infectious diseases and in their therapy. The primary emphasis is placed on learning from interaction with patients, resident staff, and faculty on the consultation service. Students are expected to work up assigned patients by interview, physical examination, and collation of laboratory results, leading to a summary and synthesis of the problem. Particular emphasis is placed on close follow-up of the patients during hospitalization, including attendance at procedures or operations whenever possible. Students should know their own patients well enough to be able to give a reasonable presentation on ward rounds or at conferences without notice. Students are expected to read standard texts in-depth about their patients' problems, as well as a few recent relevant primary references. Students are expected to attend the various conferences listed on the weekly schedule of division activities punctually, including Microbiology Plate Rounds, Journal Club, and tutorials. They are asked to present cases and provide some discussion at the Thursday V.A. Conference. Each student should be prepared to present and briefly discuss articles that he or she considers to be interesting and timely at Journal Club. (2) Methods of Evaluation: Each student's performance is evaluated and graded by the resident, fellow, and attendings, using the usual honors, pass plus, pass, deferred, or unsatisfactory system that is utilized internally in the Department of Medicine. In arriving at a consensus, appropriate emphasis is placed on knowledge, enthusiasm, and evidence of improvement during the ro-

tation. There is no written examination. Adds are accepted at any time providing the course has not been filled. However, because this course is usually oversubscribed, drops are not accepted within 30 days of the first day of classes unless the student finds her or his own replacement. MEDICINE 440C is a full-time experience. Also, it is offered as a sole-enrollment course and, as such, cannot be taken in conjunction with any other course without the permission of the advisory dean and the course director. Credit: 4. Enrollment: max 7. *Hamilton and infectious diseases staff.* Sole Enrollment

**MEDICINE-442C. CLINICAL ARRHYTHMIA SERVICE.** (1) Course Goals: Primary - To provide students with an in-depth exposure to the diagnosis and management of cardiac arrhythmias, electrophysiologic studies, ablation of arrhythmias, cardiac pacemakers, and implantable defibrillators; to help students to understand the electrophysiologic events that result in arrhythmias and ECG changes. This course is not designed to be a substitute for the general cardiology elective (MEDICINE 404C and 445C). Secondary - To familiarize the student with certain basic techniques of arrhythmia diagnosis such as esophageal recording and pacing. (2) How Goals Are Achieved: The student spends four weeks working on the Clinical Arrhythmia Service. The student makes rounds with the Clinical Electrophysiology Service on inpatients with arrhythmia problems. The student is encouraged to attend electrophysiologic studies and assist in the analysis of data from these studies. Attendance of electrophysiologic surgical procedures is also encouraged. The student is responsible for the work-up of patients admitted to the Arrhythmia Service as well as inpatient consults and plays an important role in the follow-up of these patients while they are in the hospital. The student sees outpatients during Arrhythmia Clinics that meet on Monday, Tuesday, Wednesday, and Thursday in the PDC. The student assists in the evaluation of patients for permanent pacemaker implantations. Students are responsible for reviewing the literature on subjects related to the patients that they have seen on the clinical service. (3) Methods of Evaluation: Students are evaluated on their clinical skills in taking histories, performing physical examinations as well as in their presentation and assessment of the patient's problem. They are also assessed on their ability to read and understand the relevant literature and their ability to assume a responsible role in the care of patients on the Clinical Arrhythmia Service. Credit: 4. Enrollment: max 1. *Gilliam, Sorrentino, Grant, Greenfield, Bahnson, Al-Khatib, and Ashar.*

**MEDICINE-444C. CLINICAL HEART FAILURE AND CARDIAC TRANSPLANTATION.** This course is designed to allow the student to gain a broad experience in the fields of heart failure and cardiac transplantation. The student will participate in both inpatient rounds and outpatient clinics. There will also be an opportunity to participate in the surgical management of heart failure including the use of mechanical circulatory support devices, high-risk palliative cardiac surgical procedures and cardiac transplantation. The learning objectives of the course are supplemented by multidisciplinary rounds, cardiac transplant listing conference and cardiac pathology rounds. Credit: 4. Enrollment: max 2. *Rogers and other faculty*

**MEDICINE-445C. CONSULTATIVE CARDIOLOGY.** (1) Course Goals: Primary - To refine and further develop the skills necessary for eliciting an accurate, complete CV history and for performing an accurate, complete CV physical examination: To refine student understanding of normal and pathologic cardiovascular physiology while functioning in the role of a consultant for inpatients and outpatients with various cardiovascular problems; Secondary - to develop the skills necessary to quickly and accurately interpret ECGs (both 12-lead ECGs and rhythm strips). (2) How Goals Are Achieved: Students are assigned to the consult service at either the VA Hospital or Duke, where, in concert with the resident, fellow and senior staff attending, they evaluate the operative risk for cardiac and non-cardiac surgery as well as make decisions concerning the evaluation and treatment of patients with a wide variety of heart diseases. Students participate in reading ECGs and a core curriculum experience including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by the resident, fellow, and senior staff with whom they work. The evaluation form is made available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the elective. Prerequisite: none. Credit: 4. Enrollment: max 7. *Waugh and cardiology staff*

**MEDICINE-446C. NEPHROLOGY.** (1) Course Goals: Primary: To provide clinical experience in the diagnosis and treatment of patients with kidney diseases, fluid and electrolyte disorders, and

hypertension. Secondary: To integrate physiology, immunology, pathology, and biochemistry into the evaluation and management of patients with renal disease. (2) How Goals Are Achieved: The students are integrated into the patient care team consisting of attending physician, nephrology fellows, and medical residents. They will participate in both inpatient and outpatient care of patients with a wide range of kidney diseases, fluid and electrolyte problems, and difficult to manage hypertension. Students may choose between the three major nephrology services: the Acute Service which cares for patients in the intensive care units at Duke, the Transplant Service which focuses on patients with kidney or combined kidney-pancreas transplants, and the Durham VA General Nephrology Service which provides balanced exposure to all facets of nephrology. The student participates in work rounds with the residents and fellows each day, daily rounds with the attending physician, and weekly nephrology conferences. These conferences include Journal Club where the latest clinical and basic science literature is reviewed, the weekly Nephrology Didactic Lecture Series focusing on pathophysiological principles of clinical nephrology, and Grand Rounds encompassing Pathology Conference, Clinical Case Conference, and seminars by fellows, faculty and/or visiting professors. This combination of broad-based clinical experience, coupled with formal didactics, provides the student with a comprehensive educational opportunity. (3) Methods of Evaluation: Written evaluation from faculty preceptor. Credit: 4. Enrollment: max 4. *Evans and nephrology staff*

**MEDICINE-449C. GERIATRIC MEDICINE.** 1) Course Goals: Primary - To enable the student to become familiar with the principles of caring for the geriatric patient. Secondary - To familiarize the student with the physiology and diseases of aging. (2) How Goals Are Achieved: This elective is offered by the interdepartmental faculty of the Division of Geriatric Medicine. The student works with faculty, fellows, and housestaff in a number of settings involved in the care of the geriatric patient. These include the Geriatric Evaluation and Treatment Clinic (Duke), Geriatric Evaluation Unit Clinic (Durham VA), The Forest at Duke Clinic, Extended Care and Rehabilitation Center (Durham VA) and other subspecialty clinics. Principles to be stressed are biology and pathophysiology of aging, multiple clinical problems in the elderly, interdisciplinary team approach to evaluation, planning and treatment, goals of maximal functional achievement and independence for the elderly. Specific clinical problems that students encounter include cognitive disorders, gait instability and falls, urinary incontinence, pressure sores, and chronic pain. Students also learn about the management of common chronic diseases in the elderly, including diabetes mellitus, heart disease, and osteoarthritis. The student participates actively in the work-up and management of patients work-up in inpatient extended care and outpatient settings to become more familiar with the problems of the elderly in the community. Familiarity with the growing literature in geriatric medicine is encouraged. The student participates in seminars, lectures and team meetings at the appropriate sites. (3) Methods of Evaluation: Evaluation is by consensus of instructors and fellows at the various training sites. It is based on discussions and presentations throughout the course period. Credit: 4. Enrollment: max 1. *Twersky and staff*

**MEDICINE-450C. CLINICAL DERMATOLOGY.** The elective in clinical dermatology is designed to prepare students to perform an accurate skin examination, formulate appropriate differential diagnoses, and choose relevant diagnostic or therapeutic interventions. This course is valuable to any student interested in improving their ability and confidence in the cutaneous exam. Students in the rotation spend two weeks working in the outpatient dermatology clinics, one week on the inpatient consult service at Duke, and one week at the Durham VA Medical Center. The outpatient clinical experience includes general dermatology clinics as well as a variety of specialty clinics such as pediatric dermatology, HIV dermatology, cutaneous oncology; clinic attendance can be tailored to the student's future career goals. Patient care is supplemented with lectures designed to provide the student with a foundation in dermatologic principles, and students are encouraged to attend weekly departmental teaching conferences. Student evaluations are based on the development of clinical skills as assessed by faculty and residents, and by a brief clinically oriented examination. Students are to report to the Dermatology Clinic, Duke South, Purple Zone, Clinic 3K, Room 3337 at 8:30 a.m. on the first day of the rotation for orientation. Dr. Prose is the course director and may be reached at 684-5146. Credit: 4. Enrollment: max 4. *Prose*

## MOLECULAR GENETICS AND MICROBIOLOGY

### Basic Science Electives

**MGM-253B. GENETIC ANALYSIS OF HUMAN DISEASE.** This course introduces the student to quantitative and molecular aspects in the identification of human disease genes, implications for genetic counseling and risk assessment, and legal and social issues associated with the human genome initiative. The course draws extensively from the scientific literature to illustrate concepts of linkage analysis in Mendelian and complex disease, molecular approaches to disease gene cloning, molecular mechanisms of disease gene expression, gene therapy, and the utility of animal models for understanding human disease. C-L: Graduate School. Credit: 2. *Speer, Vance, Pericak-Vance, Marchuk*

**MGM-322B. GENERAL VIROLOGY AND VIRAL ONCOLOGY.** The course is devoted to the molecular biology of mammalian viruses, with emphasis upon mechanisms of virus replication, virus-host interactions, viral pathogenicity, and the relationship of virus infection to neoplasia. C-L: IMMUNOL-252B; Graduate School. Credit: 3. Enrollment: min 5. *Keene, Alexander, Cullen, Nevins, and Pickup*

**MGM-328B. MICROBIAL PATHOGENESIS.** This is a graduate level course that primarily focuses on pathogenic bacteria and fungi. The course explores both the basic biology that underlies pathogenesis, as well as specific mechanisms of pathogenesis and virulence. Classes consist of a mixture of lectures, discussions of recent papers, and paper presentations. There are no exams, but instead, grades will be based on critiques of published papers and a research proposal due at the end of the course. C-L: Graduate School. Credit: 3. *Kreuzer and McCusker*

**MGM-330B. MEDICAL IMMUNOLOGY.** A brief review of basic concepts of immunology is followed by in-depth discussions of the role of immune mechanisms in the pathogenesis and treatment of human diseases. Principal emphasis is placed on immune deficiency diseases, hypersensitivity, alloimmunity, transplantation, infectious diseases, autoimmunity, tumor immunology, and immunohematology. When applicable the classes include patient presentations and laboratory demonstrations. C-L: IMM 330B; Graduate School. Credit: 5. F. *Ward and Staff*

**MGM-331B. COMPREHENSIVE IMMUNOLOGY.** An intensive course in the biology of the immune system and the structure and function of its component parts. Major topics discussed are: properties of antigens; specificity of antibody molecules and their biologic functions; cells and organs of the lymphoid system; structure and function of complement; inflammation and non-specific effector mechanisms; cellular interactions and soluble mediators in lymphocyte activation, replication, and differentiation; regulation of immune responses, neoplasia and the immune system; molecular structure and genetic organization of immunoglobulins, histocompatibility antigens, and T cell receptor. C-L: IMMUNOL-291B; Graduate School. Prerequisite: Permission of instructor. Credit: 3. Enrollment: max 10. *Krangel and staff*

**MGM-339B. PRECEPTORSHIP IN MICROBIOLOGY.** An individual reading and/or laboratory course in specialty areas supervised by an individual faculty member. Acceptance, nature of topic, and amount of credit by individual arrangement with proposed faculty member. Prerequisites: to be determined by instructor. Credit: 1-16. *Staff*

## NEUROBIOLOGY

### Basic Science Elective

**NEUROBIO-339B. RESEARCH IN NEUROBIOLOGY.** Guided independent study and research experience in neurobiology. Nature of topic to be decided by individual arrangement with faculty advisor. Prerequisite: consent of faculty advisor. Credit: 1-16. *Staff*

## OBSTETRICS AND GYNECOLOGY

### Required Course

**OBGYN-205C. OBSTETRICS AND GYNECOLOGY.** Required of all second-year students. Consists of six weeks in general obstetrics and gynecology. Students attend lectures, work daily in the

general and special outpatient clinics, and are assigned patients on the obstetric and gynecologic wards. Students share in patient care, teaching exercises, and in daily tutorial sessions with the faculty. Clinical conferences, a gynecologic-pathology conference, endocrine conferences, and correlative seminars and lectures are included. Credit: 6. *Livingston*

## 2nd Year Selectives

**OBGYN-220C. PRENATAL DIAGNOSIS.** Students will spend 2 weeks in one of the prenatal diagnostic units within Duke. They will divide their time between diagnostic ultrasound and genetic counseling. Some time will also be allotted to lab time in the cytogenetics lab. The student will be expected to learn common fetal malformations, genetic disorders and syndromes and be able to discuss their etiologies and evaluation. The student will be expected to understand common screening techniques in the prenatal period including pedigree analysis and risk assessment. *Boyd*

**OBGYN-221C. INTRODUCTION TO REPRODUCTIVE ENDOCRINOLOGY.** This course is a short introduction to reproductive endocrinology for students interested in a career in reproductive medicine. Because of the short duration of the course, each student is encouraged to focus either on the clinical or laboratory aspects of the service. During the course, each student will research a focused question in reproductive endocrinology and present his/her findings at a division meeting. Enrollment must be approved by a faculty mentor before registering. Credit: 2. *Walmer, Couchman, Price and Raburn*

## 2nd Year Clinical Electives

**OBGYN-260C. GYNECOLOGIC CANCER.** This course presents a clinical experience in the management of patients with a gynecologic malignancy. This will include operating room, inpatient unit and clinic experiences. The student assumes the role of a sub-intern. Outpatient, inpatient, and operative exposure to these patients is extensive. Credit: 4. Enrollment: max 1. *Berchuck, Soper, Secord, Havrilesky, Valea, and gynecologic oncology fellows*

**OBGYN-261C. CLINICAL REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY.** This is a course for students who desire additional clinical experience in the diagnosis and treatment of women with endocrine or fertility-related problems. During the course, students will participate in the care of patients with reproductive endocrine problems in the outpatient clinic, operating room, and in the hospital. Students will also be exposed to assisted reproductive technologies. During the course, each student will research a focused question in reproductive endocrinology and present his/her findings at a division meeting. Credit: 4. Enrollment: max 1. *Walmer, Couchman, Price, and reproductive endocrinology fellows*

**OBGYN-263C. PERINATAL MEDICINE.** A study of the relationship of clinical factors during pregnancy, labor, delivery, and the first month of life. Emphasis is placed on abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely affecting the fetus and the newborn, and early management of the infant. Current problems in the maternal-fetal relationships are outlined. The clinical rotation consists of half-time on the high risk obstetric service and half on the nursery service. Duke North Labor and Delivery, ICN, or Nurseries. See also PEDS 426C. Prerequisites: must contact Dr. Murtha prior to registration. Credit: 4. Enrollment: max 2. *Heine, Livingston, Murtha, and maternal-fetal medicine fellows*

## 4th Year Clinical Electives

**OBGYN-420C. GYNECOLOGIC CANCER.** This course presents a clinical experience in the management of patients with a gynecologic malignancy. This will include operating room, inpatient unit and clinic experiences. The student assumes the role of a sub-intern. Outpatient, inpatient, and operative exposure to these patients is extensive. Credit: 4 or 8. Enrollment: max 1. *Berchuck, Soper, Secord, Havrilesky, and gynecologic oncology fellows*

**OBGYN-431C. CLINICAL REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY.** Course for students who desire additional basic and clinical experience in examination, diagnosis, and treatment of obstetric and gynecologic patients with endocrinopathy and infertility. Course consists of clinical core of reproductive endocrine problems correlated with examination and treatment of

patients both in the Endocrinology Outpatient Clinic, in surgery, and in the hospital. Exposure to assisted reproductive technologies is also available depending on the current clinical load. Credit: 4. Enrollment: max 1. *Couchman, Haney, Hammond, and reproductive endocrinology fellows*

**OBGYN-439C. PRENATAL MEDICINE.** A study of the relationship of clinical factors during pregnancy, labor, delivery, and the first month of life. Emphasis is placed on abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely affecting the fetus and the newborn, and early management of the infant. Current problems in the maternal-fetal relationships are outlined. The clinical rotation consists of half-time on the high risk obstetric service and half on the nursery service. Duke North Labor and Delivery, ICN, or Nurseries. See also PEDS 426C. Prerequisites: must contact Dr. Murtha prior to registration. In order to get credit for the critical care requirement, documentation form the course director MUST be sent to the Registrar's Office. Credit: 8. Enrollment: max 2. *Heine, Livingston, Murtha, and maternal-fetal medicine fellows*

**OBGYN-447C. CLINICAL OBSTETRICS.** For students preparing for general practice of medicine, pediatrics, or obstetrics and gynecology. This course studies the relationship of clinical factors during pregnancy, labor, and delivery. Emphasis is placed on abnormal conditions of pregnancy as related to the infant. Current problems in the maternal-fetal relationship are outlined. The student functions on an intern level and takes part in activities of the housestaff and faculty. Credit: 5 or 10. Enrollment: max 2. *Heine, Livingston, Murtha, and fellows on obstetrical service*

**OBGYN-449C. CLINICAL GYNECOLOGY AND UROGYNECOLOGY.** For students preparing for obstetrics and gynecology, general practice, surgery, and urology. Emphasis is placed on the outpatient assessment and inpatient or ambulatory management of patients with acute and chronic gynecologic disorders including pelvic floor dysfunction, pelvic organ prolapse, urinary and fecal incontinence, and others. Students have the opportunity to work closely with faculty members in the Division of Gynecology. Participation in the operative care of gynecologic patients is desired. Time for independent study is planned. The student is expected to utilize this time to review and present a specific clinical problem with frequent guidance and input from a member of the Gynecology Division with similar interests. Credit: 4 or 8. Enrollment: max 1. *Weidner, Addison, Amundsen, and urogynecology fellows*

## OPHTHALMOLOGY

### 2nd Year Selectives

**OPHTHAL-220C. OPHTHALMOLOGY.** This ophthalmology selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive opthalmolgy, including subspecialties (neuro-ophthalmology, external disease, oculoplastics, cornea, refractive surgery, pediatrics, strabmismus, glaucoma, and vitreoretinal disease). There will be didactic instruction with patient care exposure in the clinic setting and operating room. Enrollment max. 5. *Fekrat*

### 2nd Year Clinical Electives

**OPHTHAL-252C. GENERAL OPHTHALMOLOGY.** A clinical preceptorship in which the student participates and observes the regular house staff activities including night call, conferences, lectures, patient care, and treatment including surgery. The use of specialized ophthalmic apparatus is emphasized. Prerequisites: OPHTHAL 420C recommended, but not required. Credit: 4. Enrollment: max 4. *Allingham*

**OPHTHAL-255C. PEDIATRIC OPHTHALMOLOGY.** A clinical preceptorship in which the student participates in the outpatient pediatric ophthalmology clinic. The student will encounter the more common ocular disorders of childhood including ocular motility disturbances, congenital cataracts and glaucoma,, and congenital genetic and metabolic disorders. In addition adult motility disorders and neuroophthalmic disease such as thyroid eye disease, cranial nerve palsies, and optic nerve abnormalities will be encountered. The diagnosis and treatment aspects are emphasized heavily and opportunities to observe surgery are provided. The course meets by arrangement and requires a minimum of 5 days per credit . Credit: 4. Enrollment: max 3. *Buckley, Enyedi, and Freedman*

### 4th Year Clinical Electives

**OPHTHAL-420C. MEDICAL OPHTHALMOLOGY.** Emphasis is placed on common ophthalmic conditions. The ophthalmic signs and symptoms of ocular and systemic diseases are presented in a lecture series. Oriented for those students interested primarily in family medicine, pediatrics, internal medicine, or ophthalmology. This clinical science course can be audited. Credit: 1. Enrollment: min 8, max 20. *Allingham*

**OPHTHAL-422C. GENERAL OPHTHALMOLOGY.** A clinical preceptorship in which the student participates and observes the regular house staff activities including night call, conferences, lectures, patient care, and treatment including surgery. The use of specialized ophthalmic apparatus is emphasized. Prerequisites: OPHTHAL 420C recommended, but not required. Credit: 4 or 8. Enrollment: max 4. *Allingham*

**OPHTHAL-423C. OPHTHALMIC PATHOLOGY.** The student reviews all ophthalmic pathology specimens submitted and any pertinent permanent specimens. He or she attends all regular ongoing ophthalmic pathology conferences. Prerequisites: OPHTHAL-422C and OPHTHAL-420C recommended, but not required. Not available during the summer term. Credit: 1. *Proia and Klintworth*

**OPHTHAL-425C. PEDIATRIC OPHTHALMOLOGY.** A clinical preceptorship in which the student participates in the outpatient pediatric ophthalmology clinic. The student will encounter the more common ocular disorders of childhood including ocular motility disturbances, congenital cataracts and glaucoma, and congenital genetic and metabolic disorders. In addition adult motility disorders and neuro-ophthalmic disease such as thyroid eye disease, cranial nerve palsies, and optic nerve abnormalities will be encountered. The diagnosis and treatment aspects are emphasized heavily and opportunities to observe surgery are provided. The course meets by arrangement and requires a minimum of 5 days per credit . Credit: 1 or 2. Enrollment: max 3. *Buckley, Enyedi, and Freedman*

## PATHOLOGY

### Basic Science Electives

**PATHOL-323B. AUTOPSY PATHOLOGY.** The course is intended to introduce students to the autopsy as an investigative tool. Anatomic-clinical correlation is emphasized. Students work directly with one or more members of the pathology department. They first assist at autopsies and then perform autopsies under supervision. They work up these cases with particular attention to correlations with clinical and experimental medicine, prepare the final autopsy reports, and work essentially at the level of a house officer. Students are expected to present their findings at staff conferences. Credit: 4 or 8. Enrollment: max 2. *Proia*

**PATHOL-327B. MOLECULAR DIAGNOSTICS.** This course is designed to provide exposure to the basic molecular biologic techniques that are used in the diagnosis and characterization of inherited diseases and human tumors. The student spends the majority of time at the bench in the Molecular Diagnostic Laboratory, first extracting nucleic acids and then performing southern blot and polymerase chain reaction studies on patients samples. The results of these studies are correlated with both clinical and histopathologic findings to learn the utility and limitations of molecular biologic analysis in the assessment of human disease. Credit: 4. Enrollment: max 2. *Gong*

**PATHOL-336B. PULMONARY PATHOLOGY AND PATHOPHYSIOLOGY.** Emphasis is on pulmonary pathology and pathophysiology of infections, metabolic, environmental, neoplastic diseases, and certain diseases of unknown etiology (sarcoid, alveolar proteinosis, e.g.). Credit: 3. Enrollment: min 2, max 15. *Roggli and Sporn*

**PATHOL-339B. FUNDAMENTALS OF ELECTRON MICROSCOPY.** Emphasis is placed on the theory and application of electron microscopy to ultrastructural pathology. The methods relating to electron microscopy as well as x-ray microanalysis, ion microscopy, and immunocytochemistry are considered. Laboratory experience is included. Credit: 3. *Shelburne, Roggli, Ingram, LeFurgey, and Miller*

**PATHOL-344B. MUSCULOSKELETAL PATHOLOGY.** An overview of skeletal pathology beginning with the development of the normal skeleton. A systematic review of inflammatory, neo-

plastic, metabolic, arthritic, vascular, dysplastic, and traumatic diseases of the skeleton. Clinical correlation. Credit: 2. Enrollment: min 4, max 10. *Harrelson*

**PATHOL-345B. MOLECULAR ASPECTS OF DISEASE.** This course presents background, investigative methods, and recent advances in understanding the molecular basis of selected diseases, with an in-depth focus on a small number of diseases whose defects are known at the genetic or molecular levels. The course is taught in a small group seminar format by experts in each disease studied. Topics include molecular cytogenetics, immunodeficiency diseases, mechanisms of microbial antibiotic resistance, hemoglobinopathies, neurologic/neuromuscular diseases, coagulopathies, cancer susceptibility genes, tumor suppressor genes, ethical issues in genetic susceptibility testing, gene therapy, and more. Credit: 3. Enrollment: min 5 max 50. *Hale and staff*

**PATHOL-348B. PRACTICAL SURGICAL PATHOLOGY.** This course is intended as an introduction to the practice of diagnostic surgical pathology. Clinical and morphologic aspects of disease are emphasized in rotations through the different specialty services (Intra-operative Consultation, GYN Path, GI Path, etc.) Students will participate (with residents and staff) in the evaluation of gross specimens, interpretations of glass slides (with ancillary studies), and the preparation of the final report. The course can be tailored to individuals planning a career in pathology or those pursuing other specialties. Rotations through the Fine Needle Aspiration and Exfoliative Cytology services can be scheduled depending on the student's interest. Preference given to Pathology Study Program students. Credit 4 or 8. Enrollment: max 2. *Bentley and staff*

## 2nd Year Clinical Selectives

**PATHOL-220C. WHAT DOES A PATHOLOGIST REALLY DO?.** The major objective of this selective is to provide the student with answers to the following questions: a) What are the major areas that comprise the practice of pathology (Laboratory Medicine)? What is Anatomic Pathology? Clinical Pathology (Laboratory Medicine)? What are the recognized sub-specialties in pathology? b) How doe the pathologist function as part of the health care team? What role does a pathologist play in clinical decision making? c) If you practice Internal Medicine / Surgery / Pediatrics / Ob-Gyn / Primary Care, what can the pathologist do for you? d) What is the pathologist's role as a teacher? Students will participate in several learning experiences (2-3 days each) that involve working with faculty and residents in various sub-disciplines of pathology [e.g., autopsy, surgical pathology (frozen section diagnostic service, specimen accessioning/gross descriptions service, diagnostic services), hematopathology/flow cytometry, neuropathology, dermatopathology, cytopathology/fine needle aspiration service, molecular diagnostics, cytogenetics, immunopathology/transplantation pathology, transfusion medicine, and others]. The exact set of experiences will depend on student interests, faculty availability, and number of students on the service. In each case, every attempt will be made to give the student the types of experiences that allow for fulfillment of the course objectives. Students will attend selected conferences and seminars and will meet with the course director (or his representative) at least twice during the selective. The majority of learning experiences will be in the Dept. of Pathology at DUMC. A few are located at DVAMC and at the Franklin Park clinical Laboratories. *Buckley*

## 2nd Year Clinical Electives

**PATHOL-240C. SURGICAL PATHOLOGY - EMPHASIS: ELECTRON MICROSCOPY.** This course is an apprenticeship in which the student becomes engaged in the actual preparation and diagnosis of tissue changes using both light and electron microscopy. The student, of necessity, learns how to operate the electron microscope. Prerequisites: PATHOL-339B suggested, but not required. Permission of instructor is required. Credit: 4. Enrollment: max 1. *Shelburne and Vollmer*

**PATHOL-248C. PRACTICAL SURGICAL PATHOLOGY.** This course is intended as an introduction to the practice of diagnostic surgical pathology. Clinical and morphologic aspects of disease are emphasized in rotations through the different specialty services (Intra-operative Consultation, GYN Path, GI Path, etc.) Students will participate (with residents and staff) in the evaluation of gross specimens, interpretations of glass slides (with ancillary studies), and the preparation of the final report. The course can be tailored to individuals planning a career in pathology or those pursuing other specialties. Rotations through the Fine Needle Aspiration and Exfoliative Cytology services can be

scheduled depending on the student's interest. Preference given to Pathology Study Program students. Credit 4. Enrollment: max 2. *Bentley and staff*

**PATHOL-250C. MEDICAL MICROBIOLOGY.** This is an introduction to medical microbiology (MM) including appropriate use of diagnostic tests and other laboratory resources for patient care and hospital infection control. The student participates in laboratory rounds with the faculty, medical microbiology fellows, and the infectious diseases services. The student has access to appropriate bench experience in all sections (bacteriology, molecular microbiology, mycobacteriology, parasitology, serology, sexually transmitted infections, virology) of the Clinical Microbiology Laboratory. Permission of instructor is required. Credit: 4. Enrollment: max 1. *Reller, Alexander, Harrell, Henshaw, and staff*

**PATHOL-251C. CYTOPATHOLOGY PRECEPTORSHIP.** This course consists of full-time rotation in the diagnostic cytopathology laboratories. By working with the laboratory staff, the student explores in detail the role played by diagnostic cytopathology in the diagnosis of disease. In addition to general cytology, the student has the opportunity to participate in the fine needle aspiration biopsy service. Although not a requirement, the student is encouraged to pursue special research projects. Preference given to Pathology Study Program students. Prerequisite: Permission of Instructor is Required. Credit: 4. Enrollment: max 1. *Jones, Dodd and cytopathology staff*

**PATHOL-253C. AUTOPSY PATHOLOGY.** The course is intended to introduce students to the autopsy as an investigative tool. Anatomic-clinical correlation is emphasized. Students work directly with one or more members of the pathology department. They first assist at autopsies and then perform autopsies under supervision. They work up these cases with particular attention to correlations with clinical and experimental medicine, prepare the final autopsy reports, and work essentially at the level of a house officer. Students are expected to present their findings at staff conferences. Preference given to Pathology Study Program students. Credit: 4. Enrollment: max 2. *DiBernando*

### 4th Year Clinical Electives

**PATHOL-423C. AUTOPSY PATHOLOGY.** The course is intended to introduce students to the autopsy as an investigative tool. Anatomic-clinical correlation is emphasized. Students work directly with one or more members of the pathology department. They first assist at autopsies and then perform autopsies under supervision. They work up these cases with particular attention to correlations with clinical and experimental medicine, prepare the final autopsy reports, and work essentially at the level of a house officer. Students are expected to present their findings at staff conferences. Credit: 4 or 8. Enrollment: max 2. *Proia*

**PATHOL-448C. PRACTICAL SURGICAL PATHOLOGY.** This course is intended as an introduction to the practice of diagnostic surgical pathology. Clinical and morphologic aspects of disease are emphasized in rotations through the different specialty services (Intra-operative Consultation, GYN Path, GI Path, etc.) Students will participate (with residents and staff) in the evaluation of gross specimens, interpretations of glass slides (with ancillary studies), and the preparation of the final report. The course can be tailored to individuals planning a career in pathology or those pursuing other specialties. Rotations through the Fine Needle Aspiration and Exfoliative Cytology services can be scheduled depending on the student's interest. Preference given to Pathology Study Program students. Credit 4 or 8. Enrollment: max 2. *Bentley and staff*

## PEDIATRICS

### Required Course

**PEDS-205C. PEDIATRICS.** The basic course in pediatrics for all students is a six-week clerkship in the second year. Its principal aim is to provide an exposure to the field of child health. The student has a varying series of experiences which should give a grasp of the concepts that underlie the discipline. Goals include acquiring familiarity and competence with the basic tools of information-gathering (history, physical examination, and laboratory data) and developing an approach to the integration of this material for the solution of problems of health and illness in infancy, childhood, and adolescence. This should be accomplished with continuing reference to the basic principles of pathophysiology encountered in the first year courses. Those patients to whom the student is assigned

provide the focus for case studies. In addition to the careful history and physical examination which must be recorded, the student is expected to organize an appropriate differential diagnosis and to seek and read pertinent reference material relevant to each patient. The student should learn to present each case verbally in an organized and succinct fashion, to follow the patient's progress, and to interpret all studies which are performed. The student is expected to learn from a number of sources: Internet accessible multimedia clinical cases, standard textbooks and journals, current publications and conferences, and also from people -- house staff, faculty, nurses, parents, and all others with whom contact is made in the clinical setting. Objectives include an understanding of the roles played in pediatrics by other members of the health care team, both in the ambulatory and hospital settings. Patient care may involve nurse, social worker, recreation therapist, psychologist, physiotherapist, dietitian, and others. The six weeks are divided to include time in several of the following settings: (a) Duke outpatient clinics and emergency room, (b) Duke inpatient, (c) Durham Regional Hospital, (d) Duke nursery, and (e) Lincoln Community Health Center. Credit: 6. *Drucker*

## 2nd Year Selectives

**PEDS-220C. CLINICAL GENETICS AND METABOLISM.** The students will join the clinical genetics and metabolism service for DUMC and participate in all the activities of the team - outpatient clinics, inpatient consults, case conferences and didactic presentations. They will perform history-taking, pedigree construction, physical examination (including dysmorphology assessment) and construct a differential diagnosis using reading materials, internet resources and databases. They will observe genetic counseling sessions. *Marie McDonald*

**PEDS-221C. CHILD ABUSE AND FAMILY VIOLENCE.** This selective provides students the opportunity to learn about child abuse and family violence, the effect of these issues on individual health needs of patients, the impact of these issues on public health, and the role of the physician to address these issues. Students will participate in the evaluation of patients in an outpatient medical child abuse clinic, observe inpatient child abuse consults, observe family based interventions, observe court proceedings, and participate in mental health didactics. Students will choose a topic in child abuse or family violence for further study and present their findings to the Child Abuse Consult team. This selective is appropriate for all students interested in learning more about family violence in adult or pediatric clinical medicine and/or public health. *Aditee Pradhan Narayan and Karen St. Claire*

**PEDS-222C. OVERVIEW OF PEDIATRIC HEMATOLOGY-ONCOLOGY.** This selective will be offered through the Division of Pediatric Hematology-Oncology within the Department of Pediatrics. During the two week course, students will experience an overview of pediatric hematology-oncology. Students will be expected to round on the in-patient service and to participate in outpatient care provided in the Children's Health Center. Students also will be asked to attend conferences, including patient care conferences, psychosocial rounds, and didactic conferences. In addition, students will meet with individual faculty and staff members for an hour three times a week to discuss specific topics including: sickle cell disease, anemia, leukemia, lymphoma, solid tumors and disorders of the coagulation system as well as psychosocial and ethical issues. *Thomas R. Kinney*

**PEDS-223C. PEDIATRIC INTENSIVE CARE UNIT.** This advanced course is designed to allow students a two-week experience in the Pediatric Intensive Care Unit (PICU). Under the supervision of faculty attendings, fellows, and residents, students participate in the care of critically ill children admitted to the PICU for multidisciplinary care. Emphasis is placed on the development of the pathophysiologic approach to the diagnosis and treatment of a broad spectrum of pediatric illnesses as they present in acute care settings. Advanced concepts in pediatric critical care are emphasized. Students are expected to take night call with pediatric house staff. Enrollment: max 2. *Cheifetz, Kern, Meliones, Schulman, Turi, and Weldon.*

**PEDS-224C. DEVELOPMENTAL CARE OF SICK NEWBORNS-IMPORTANCE OF TEAMWORK.** This selective will introduce the student to the more "general pediatric" aspect of neonatology, namely developmental care, as well as promote the importance of teamwork in caring for premature and sick babies. Students will gain an appreciation of the importance of early intervention, both in the hospital and after discharge for high-risk infants. They will participate in the activities of the developmental team in the intensive care and transitional care nurseries and learn the important role

played by psychologists, therapists and social workers in caring for these infants and their families. They will attend developmental rounds, Special Infant Care Clinic and shadow Dr. Goldstein and other members of the developmental team. *Ricki Goldstein*

## 2nd Year Clinical Electives

**PEDS-251C. PEDIATRIC INFECTIOUS DISEASES.** This course provides experience in the clinical and laboratory diagnosis of infectious diseases and in their therapy. The student works closely with the infectious disease fellow and participates actively in evaluation of patients. Daily rounds in microbiology laboratory. Prerequisite: PEDS 205C Credit: 4. Enrollment: max 2. *Cunningham, St. Geme, Katz, Drucker, McKinney, Jhaveri, Steinbach and Benjamin*

**PEDS-253C. ALLERGY AND CLINICAL IMMUNOLOGY.** Clinical evaluation and practice in use of methods of diagnosis and treatment of allergic and immunologic disorders including the atopic diseases, immunologic deficiency states, and bone marrow transplantation. Scope: in-depth seminars, history, physical examination, skin testing, a variety of clinical immunologic tests, and Clinical Research Unit experience. Prerequisite: PEDS 205C Credit: 4. Enrollment: max 2. *Burks, Markert, Williams, Roberts, Frank, Buckley and Mankad*

**PEDS-254C. CLINICAL GENETICS AND METABOLISM.** The student becomes familiar with evaluation and management of various genetic disorders including malformation syndromes and biochemical disorders. History-taking, pedigree construction and analysis, specialized aspects of the dysmorphological physical examination, diagnostic techniques, routine and specialized laboratory methods (cytogenetic, biochemical, molecular), and reference materials (texts and computer programs) are covered. Students participate in weekly teaching and clinical conferences. Credit 4. Enrollment: max 2. *McDonald*

**PEDS-257C. PEDIATRIC HEMATOLOGY AND ONCOLOGY.** Includes all aspects of clinical and laboratory hematology as well as the diagnostic evaluation, care, and treatment of patients with malignant diseases. Emphasis is placed on fundamental concepts. Students will accompany the inpatient team on the ward rounds for 2 weeks of the rotation with the remaining time spent in the clinic evaluating new patients and seeing established patients. Students also are expected to attend divisional teaching conferences. Students will be asked to research a specific topic and present a short presentation at the end of their rotation. Prerequisite: PEDS 205C contact instructor. Credit: 4. Enrollment: max 1. *Kinney ,Chung*

**PEDS-261C. CLINICAL PEDIATRIC CARDIOLOGY.** This Medical Student rotation provides an intensive learning experience in the clinical diagnosis and management of childhood heart disease. Emphasis is placed upon inpatient and outpatient management. The inpatient section includes a pre and post operative management of children with heart disease via a step-down/Ward environment. The outpatient section includes exposure to cardiovascular procedures including interventional techniques and echocardiography as well as management of children referred for a cardiology evaluation or follow-up via clinic or consultation. The Medical Student also is exposed to pediatric acute care medicine and the modalities available to maintain cardiovascular function in the extremely ill child. Scope: history, physical examination, and special diagnostic techniques (echocardiography, electrocardiography, cardiac catheterization and cineangiography). Students participate on daily ward rounds, out-patient clinics four days per week, and all clinical and didactic teaching conferences of the division. Prerequisite: PEDS 205C. Credit: 4. Enrollment: max 2. *Rhodes, Armstrong, Leonard, Herlong, Kanter, Camitta, Barker, Delaney and Carboni*

**PEDS-265C. ENDOCRINE DISORDERS IN CHILDREN.** Students attend in the Pediatric Endocrine, Diabetes, and Insulin Resistance/Obesity Clinics and assume active roles in the evaluation and management of in-patients admitted to the Endocrine Service. Emphasis is placed upon the evaluation of growth and sexual development as indices of endocrine status during childhood. Students also participate in a monthly endocrine journal club and in weekly intra- and interdepartmental endocrine clinical and research conferences. Students will make a presentation to the endocrine group at the end of the rotation. Prerequisite: PEDS 205C, contact instructors. Credit: 4 Enrollment: max 2. *Freemark and staff*

**PEDS-266C. PEDIATRIC NEUROLOGY.** Students will partake in the evaluation and management of both hospitalized and ambulatory pediatric patients with neurological disorders. Emphasis is placed on the neurodevelopmental history, neurological examination, the use of laboratory tests and radiological tools and pharmacotherapy in the diagnosis and management of childhood neurological disorders. Prerequisite: PEDS 205C contact Dr. Lewis. Credit: 4. Enrollment: max 2. *Lewis*

**PEDS-270C. INTRODUCTION TO THE PEDIATRIC INTENSIVE CARE UNIT.** This course is designed for second year medical students to allow students a four-week experience in the Pediatric Intensive Care Unit. Under supervision of faculty attendings. fellows, and residents, students participate in the care of critically ill children admitted to the Pediatric Intensive Care Unit. Emphasis is placed on the development of the pathophysiologic approach to the diagnosis and therapy of a broad spectrum of pediatric illnesses as they present in acute care settings. Advanced concepts in pediatric critical care are emphasized. Students are expected to take night call with pediatric house staff. Prerequisite: PEDS 205C. Credit: 4. Enrollment: max 2. *Cheifetz, Kern, Meliones, Schulman, Turi, and Weldon*

**PEDS-271C. PEDIATRIC NEPHROLOGY.** The course is designed to provide experience in diagnosis, interpretations of laboratory tests, natural history, and treatment of acute and chronic disorders of the kidney in children. The student also is exposed to the management of fluid and electrolyte disorders in infants and children. Prerequisite: PEDS 205C prior approval of Dr. Wigfall. Credit: 4. Enrollment: max 1. *Foreman and Wigfall*

**PEDS-290C. ADVANCED PEDIATRICS.** This course permits the student to elect an in-depth experience within pediatrics. Each student has a specific faculty preceptor who develops and implements the curriculum tailored to the individual's needs. Listed below are the faculty representatives to contact. Arrangements for the elective must be made with these individuals prior to enrolling in the course. The name of the preceptor with whom a student is working must be designated during web registration. Drucker and selected departmental representatives. Division Faculty Telephone: Emergency Department Eric Higginbotham, M.D. 684-5537* Gastroenterology Martin Ulshen, M.D. 681-4841 Pulmonary Richard Kravitz, M.D. 684-2289 Rheumatology Egla Rabinovich, M.D. 684-6575 Sports Medicine Deborah Squire, M.D. 477-4297 *In the Emergency Department, the student participates in the initial evaluation, stabilization and management of pediatric medical and surgical patients. Special emphasis is placed on the approach to the pediatric trauma victim. Weekly didactic lectures and case review conferences are offered. The student is expected to research a relevant topic of his/her interest and lead a brief discussion with faculty and house staff during the elective. The student is evaluated by the ED Attending staff and receives ongoing feedback throughout the rotation as well as a formal exit interview. Enrollment: max 1; Credits: 4 Prerequisite: PEDS 205C. *Contact Dr. Drucker before registering.*

## 4th Year Clinical Electives

**PEDS-401C. ADVANCED CLERKSHIP IN PEDIATRICS.** This course is designed to provide the student with an intensive, in-depth exposure to the diagnosis and management of pediatric patients hospitalized at Duke. Students are responsible for admission histories, physical examinations, and management throughout the hospitalization. The student serves as an acting intern throughout the rotation. Night call is expected every fourth night. This is a sole-enrollment course and cannot be taken in conjunction with any other course. Students must obtain the permission of Dr. Robert Drucker to register for or to drop this course. Credit: 5. Enrollment: max: 4. *Drucker and faculty*

**PEDS-410C. ADVANCED PEDIATRICS.** This course permits the student to elect an in-depth experience within pediatrics. Each student has a specific faculty preceptor who develops and implements the curriculum tailored to the individual's needs. Listed below are the faculty representatives to contact. Arrangements for the elective must be made with these individuals prior to enrolling in the course. The name of the preceptor with whom a student is working must be designated during web registration. Credit: 1 to 8. Enrollment: max 1. Drucker and selected departmental representatives. Division Faculty Telephone: Emergency Department Eric Higginbotham, M.D. 684-5537* Gastroenterology Martin Ulshen, M.D. 681-4841 Pulmonary Richard Kravitz, M.D. 684-2289 Rheumatology Egla Rabinovich, M.D. 684-6575 Sports Medicine Deborah Squire, M.D. 477-4297 *In the

Emergency Department, the student participates in the initial evaluation, stabilization and management of pediatric medical and surgical patients. Special emphasis is placed on the approach to the pediatric trauma victim. Weekly didactic lectures and case review conferences are offered. The student is expected to research a relevant topic of his/her interest and lead a brief discussion with faculty and house staff during the elective. The student is evaluated by the ED Attending staff and receives ongoing feedback throughout the rotation as well as a formal exit interview. Prerequisite: *Contact Dr. Drucker before registering*.

**PEDS-421C. PEDIATRIC INFECTIOUS DISEASES.** This course provides experience in the clinical and laboratory diagnosis of infectious diseases and in their therapy. The student works closely with the infectious disease fellow and participates actively in evaluation of patients. Daily rounds in microbiology laboratory. Students planning to enroll for fewer than 4 credits should contact Dr. Cunningham in advance. Credit: 1 to 8. Enrollment: max 2. *Cunningham, St. Geme, Katz, Drucker, McKinney, Jhaveri, Steinbach and Benjamin*

**PEDS-425C. ENDOCRINE DISORDERS IN CHILDREN.** Students attend in the Pediatric Endocrine, Diabetes, and Insulin Resistance/Obesity Clinics and assume active roles in the evaluation and management of in-patients admitted to the Endocrine Service. Emphasis is placed upon the evaluation of growth and sexual development as indices of endocrine status during childhood. Students also participate in a monthly endocrine journal club and in weekly intra- and interdepartmental endocrine clinical and research conferences. Students will make a presentation to the endocrine group at the end of the rotation. Prerequisite: contact instructors. Credit: 1 to 8. Enrollment: max 2. *Freemark and staff*

**PEDS-426C. NEONATOLOGY.** Students have patient care responsibilities and experiences in the Duke North Intensive Care Nursery. The course involves direct participation in patient care under the supervision of the faculty and housestaff. Emphasis is placed on the initiation of parent-child relationships and a pathophysiologic approach to assessment and management of the critically ill neonate. This is a sole-enrollment course and, as such, cannot be taken in conjunction with any other course. Prerequisite: PEDS and contact Dr. Ronald Goldberg. Credit: 5. Enrollment: max 1. *Goldberg, Goldstein, Auten, Tanaka, Meyers, Cotten, Bidegain, Izatt, and Malcolm*

**PEDS-427C. PEDIATRIC HEMATOLOGY AND ONCOLOGY.** Includes all aspects of clinical and laboratory hematology as well as the diagnostic evaluation, care, and treatment of patients with malignant diseases. Emphasis is placed on fundamental concepts. Students will accompany the inpatient team on the ward rounds for 2 weeks of the rotation with the remaining time spent in the clinic evaluating new patients and seeing established patients. Students also are expected to attend divisional teaching conferences. Students will be asked to research a specific topic and present a short presentation at the end of their rotation. Prerequisite: contact instructor. Credit: 4. Enrollment: max 1. *Kinney, Chung*

**PEDS-431C. CLINICAL PEDIATRIC CARDIOLOGY.** This Medical Student rotation provides an intensive learning experience in the clinical diagnosis and management of childhood heart disease. Emphasis is placed upon inpatient and outpatient management. The inpatient section includes a pre and post operative management of children with heart disease via a step-down/Ward environment. The outpatient section includes exposure to cardiovascular procedures including interventional techniques and echocardiography as well as management of children referred for a cardiology evaluation or follow-up via clinic or consultation. The Medical Student also is exposed to pediatric acute care medicine and the modalities available to maintain cardiovascular function in the extremely ill child. Scope: history, physical examination, and special diagnostic techniques (echocardiography, electrocardiography, cardiac catheterization and cineangiography). Students participate on daily ward rounds, out-patient clinics four days per week, and all clinical and didactic teaching conferences of the division. Prerequisite: PEDS 205C. Credit: 1 to 4 (or 8 with special permission of the instructor). Enrollment: max 2. *Rhodes, Armstrong, Leonard, Herlong, Kanter, Camitta, Barker, Delaney and Carboni*

**PEDS-433C. ALLERGY AND CLINICAL IMMUNOLOGY.** Clinical evaluation and practice in use of methods of diagnosis and treatment of allergic and immunologic disorders including the atopic diseases, immunologic deficiency states, and bone marrow transplantation. Scope: in-depth

seminars, history, physical examination, skin testing, a variety of clinical immunologic tests, and Clinical Research Unit experience. Credit: 1 to 8. Enrollment: max 2. *Burks, Markert, Williams, Roberts, Frank, Buckley, Lee and Mankad*

**PEDS-434C. CLINICAL GENETICS AND METABOLISM.** The student becomes familiar with evaluation and management of various genetic disorders including malformation syndromes and biochemical disorders. History-taking, pedigree construction and analysis, specialized aspects of the dysmorphological physical examination, diagnostic techniques, routine and specialized laboratory methods (cytogenetic, biochemical, molecular), and reference materials (texts and computer programs) are covered. Students participate in weekly teaching and clinical conferences. Credit: 1 to 4. Enrollment: max 2. *McDonald*

**PEDS-436C. PEDIATRIC NEUROLOGY.** Students will partake in the evaluation and management of both hospitalized and ambulatory pediatric patients with neurological disorders. Emphasis is placed on the neurodevelopmental history, neurological examination, the use of laboratory tests and radiological tools and pharmacotherapy in the diagnosis and management of childhood neurological disorders. Prerequisite: contact Dr. Lewis. Credit: 1 to 8. Enrollment: max 2. *Lewis*

**PEDS-440C. PEDIATRIC INTENSIVE CARE UNIT.** This advanced course is designed to allow students a four-week experience as a subintern in the Pediatric Intensive Care Unit. Under supervision of faculty attendings, fellows, and residents, the senior student assumes responsibility for the care of critically ill children admitted to the medicine and surgery services in the Pediatric Intensive Care Unit. Emphasis is placed on the development of the pathophysiologic approach to the diagnosis and therapy of a broad spectrum of pediatric illnesses as they present in acute care settings. Advanced concepts in pediatric critical care are emphasized. Students are expected to take night call with pediatric house staff. Prerequisite: PEDS 205C. Credit: 5. Enrollment: max 2. *Cheifetz, Kern, Meliones, Schulman, Turi, and Weldon*

**PEDS-441C. PEDIATRIC NEPHROLOGY.** The course is designed to provide experience in diagnosis, interpretations of laboratory tests, natural history, and treatment of acute and chronic disorders of the kidney in children. The student also is exposed to the management of fluid and electrolyte disorders in infants and children. Prerequisite: prior approval of Dr. Wigfall. Credit: 1 to 4. Enrollment: max 1. *Foreman and Wigfall*

**PEDS-443C. ADOLESCENT MEDICINE.** Students participate in a weekly seminar on Tuesday mornings with an emphasis on the behavioral and developmental aspects of adolescence, substance abuse, contraception, and eating disorders. Patient interactions are arranged at Duke Children's Primary Care on Monday and Friday afternoons. Optional clinic time may be arranged at Wake Teen Medical Services in Raleigh on Wednesday afternoons, or at the Sports Medicine Clinic on Friday afternoons. Tutorial and supervisory time to discuss specific patients and pertinent literature is arranged. A brief, informal presentation on the student's adolescent topic of choice is expected at the end of the clerkship. Credit: 2. Enrollment: max 1. *Bravender*

## PHARMACOLOGY AND CANCER BIOLOGY

### Basic Science Electives

**PHARM-333B. ESSENTIALS OF PHARMACOLOGY, TOXICOLOGY, AND DRUG DISCOVERY.** Drug absorption, distribution, excretion and metabolism; structure and activity relationships; drug and hormone receptors and target cell responses. C-L: Graduate School. Credit: 4. Enrollment: min 5, max 30. *Slotkin and staff*

**PHARM-339B. RESEARCH IN PHARMACOLOGY.** Laboratory investigation in various areas of pharmacology. C-L: Graduate School. Credit to be arranged. Credit: 1-16. *Staff*

## PSYCHIATRY

### Required Course

**PSYCHTRY-205C. PSYCHIATRY.** This course is a required four-week clerkship in clinical psychiatry for second year medical students. Students assume limited responsibility with supervision

for the diagnosis and treatment of patients with common and severe psychiatric illnesses. Educational settings include inpatient psychiatry services at four different hospitals, psychiatry outpatient clinics, and the psychiatry emergency rooms of two hospitals. Students participate in a series of core didactic lectures and didactic modules which expose them to basic psychopathologic entities, differential diagnosis of psychiatric symptoms, practical application of treatment modalities, and issues of cost effectiveness in diagnosis and treatment. Students also participate in lectures, rounds, and clinical case conferences particular to their rotation site. Students are encouraged to observe psychotherapy and to participate in supervised psychological treatments wherever appropriate opportunities can be provided. Credit: 4. *Stein*

### Basic Science Electives

**PSYCHTRY-323B. NEUROBIOLOGICAL BASIS OF BEHAVIOR.** The course surveys neuroanatomical, neurophysiological, neurochemical and neuropharmacological evidence of central nervous system function as it relates to normal and abnormal behavior. Clinical description, measurements of function and laboratory models of function as well as the biological substrates of affective disorders and psychoses are emphasized. Scientific bases of current therapeutic procedures, especially psychopharmacological, are examined. Course format consists of assigned readings, study questions, and lectures by faculty and other active researchers. Mid-term and final examinations are given. Each student is expected to critique a circumscribed area of research literature focusing on the appropriateness of conceptualizations and experimental methods. Additionally, students have an opportunity to become acquainted with, and to participate in, ongoing research. C-L Graduate School, PHARM 423. Credit: 4. Enrollment: min 1. *Krystal*

**PSYCHTRY-327B. ETHNIC AND MINORITY HEALTH PATTERNS AND PROBLEMS.** Descriptive and analytical focus on the literature about ethnic and minority health patterns in the United States, the issues inherent therein, and the implications thereof for the delivery of medical services. Credit: 4. Enrollment: min 1. *Carter and Anderson-Brown*

**PSYCHTRY-339B. PRECEPTORSHIP IN BEHAVIORAL NEUROSCIENCES.** This course provides an opportunity for the student to work closely with a member of the faculty in an area of mutual interest with emphasis upon research (see the website: http://thirdyear.mc.duke.edu, Behavioral Neurosciences Study Program section, for partial list of interest areas; more complete descriptions available). Credit: 1-16. *Krystal*

### 2nd Year Selectives

**PSYCHTRY-220C. ADDICTION PSYCHIATRY.** Students are exposed to the multidisciplinary, biopsychosocial evaluation and treatment of individuals with substance use disorders, including abuse and dependence involving alcohol, tobacco, illicit drugs and prescription medications. Students encounter patients engaged in the process of active, ongoing recovery from addictions, employing individual and group therapies, pharmacotherapy, and self-help groups. They are exposed to the assessment and management of patients with co-morbid psychiatric disorders and addiction. Assigned readings address epidemiology, neurobiology, and clinical management of addictions. *Stein*

**PSYCHTRY-221C. CLINICAL INTRO TO CHILD PSYCHIATRY.** This two-week course will be an opportunity to observe and learn about the specialty of child psychiatry. A series of clinical experiences with children and adolescents who are experiencing mental health problems and disorders will be offered in both an outpatient and inpatient setting. Medical Students will have opportunities to observe comprehensive evaluations, consultations, and treatments. Participation in a weekly Evidence Based Medicine seminar and didactic sessions in child psychopathology will be included. *Chrisman and Allsbrook*

**PSYCHTRY-222C. GERIATRIC PSYCHIATRY.** Objective: To provide exposure to the psychiatric care of geriatric patients. Students will rotate on an inpatient unit at John Umstead Hospital, and in a variety of outpatient/ consultation settings including the Neurodiagnostic Clinic, the GET clinic and the Forest at Duke Nursing Home. Students will learn about comprehensive psychiatric evaluation of older patients with a variety of psychiatric diagnoses including mood disorders, dementia, psychotic disorders, and personality disorders, usually in the context of significant medical co-morbid-

ity. Students will also learn the bio-psycho-social approach to managing various disorders. Students will participate in ongoing weekly didactic seminars and journal club. *Thakur*

## 2nd Year Clinical Electives

**PSYCHTRY-253C. CLINICAL ASPECTS OF ALCOHOL AND DRUG ABUSE.** This course offers students experience in the outpatient treatment of patients with substance use disorders. Students may request assignment to the Durham VAMC Substance Abuse Outpatient Program (VA-SAOP) or to the Duke Addictions Program (DAP). Emphasis is placed on understanding the relationships between addictive disorders and other psychiatric conditions and between addictions treatment and general medical care. Experiences include diagnostic evaluation, pharmacological management, and individual, group, and family psychotherapy. Students function as members of the multidisciplinary treatment team at either site. Students interested in this elective must contact Roy Stein at least eight weeks prior to desired term in order to develop a plan appropriately tailored to the student's interests. Prerequisite: PSYCHTRY 205C Credit: 4. Enrollment: min 1, max 2. *Stein*

**PSYCHTRY-255C. MODERN PSYCHOTHERAPY: INTENSIVE CLINICAL INTRODUCTION.** In this full-time (or near full-time) introduction, the student participates actively in assessment of outpatients for psychotherapy, short-term psychotherapy of inpatients, ongoing psychotherapy groups, and family therapy sessions. In addition he/she attends seminars on the various psychotherapeutic approaches: psychoanalytically oriented, cognitive, behavioral, interpersonal, systemic, etc. Readings are assigned and discussed. The student may pursue an area of special interest in greater depth with a selected preceptor. Permission of instructor is required to elect the course at any time other than section 41 of the fall term. Prerequisite: PSYCHTRY 205C Credit: 4. Enrollment: min 1. *Kudler*

**PSYCHTRY-265C. CONSULTATION-LIAISON PSYCHIATRY.** The consultation-liaison services at both the Duke Hospital and VA Hospital offer clinical clerkships in the diagnosis and management of psychiatric problems on the inpatient medical, surgical, and rehabilitation floors (VA). The student does psychiatric consultations in various specialized medical and surgical services under supervision of residents and attendings. Emphasis is placed on training the student in advanced interviewing techniques and in assessment and intervention for psychiatric co-morbidities in these medically ill patients. The site selected and the specific specialty area chosen depend on the availability and location of psychiatric consultants with those interests. The rotation is flexible. We try to match student interests with the interests of available consultants. Students need to obtain approval from *Dr. Harold Goforth (VA) or Dr. Eric J. Christopher (Duke)* four weeks in advance before enrolling in this rotation. Prerequisite: PSYCHTRY 205C Credit: 4. Enrollment: max 1.

## 4th Year Clinical Electives

**PSYCHTRY-401C. SUBINTERNSHIP IN PSYCHIATRY.** This course is an intensive clinical experience in the diagnosis and treatment of severe and incapacitating psychiatric disorders. The student is given more clinical responsibility than the comparable second year inpatient rotation. Patient care responsibilities include management of ward milieu. Treatment approaches emphasizing psychotropic medication and individual, family, and group psychotherapy are part of the clinical experience. Participation at selected patient care conferences and didactic lectures is expected. The rotation is available at Duke with specialty program experience that can be structured to include a survey of the variety of residential treatments available in this area. If desired, a student can arrange for a special reading tutorial in related topics (e.g., schizophrenia). Prerequisites: instructor approval and satisfactory completion of PSC-205C (or equivalent for visiting students).Credit: 4 or 8. Enrollment: max 1. *Raj*

**PSYCHTRY-405C. SUBINTERNSHIP IN INTERNAL MEDICINE/PSYCHIATRY.** This course is an intensive clinical experience in the diagnosis and treatment of severe and incapacitating co-morbid medical and psychiatric disorders requiring acute hospitalization. Students participating in this four-week elective based in Duke North Hospital are expected to function with intern-level responsibility, assuming complete care of assigned patients. The Medicine/Psychiatry faculty on the GenMed 12 service provides direct supervision. The goal of the elective is to refine and then clinically apply a basic knowledge base from the fields of Internal Medicine and Psychiatry. Participation at selected

case conferences and didactic sessions is expected. Additionally, each student is required to present two patient case-based, critically appraised topics during the elective. Call is taken in both Medicine and Psychiatry in alternating fashion every fifth night. Prerequisite: permission of instructor and successful completion of PSC-205C and MD-205C. Credit: 5. Enrollment: max 1. *Raj, Christopher*

**PSYCHTRY-435C. MODERN PSYCHOTHERAPY: INTENSIVE CLINICAL INTRODUCTION.** In this full-time (or near full-time) introduction, the student participates actively in assessment of outpatients for psychotherapy, short-term psychotherapy of inpatients, ongoing psychotherapy groups, and family therapy sessions. In addition he/she attends seminars on the various psychotherapeutic approaches: psychoanalytically oriented, cognitive, behavioral, interpersonal, systemic, etc. Readings are assigned and discussed. The student may pursue an area of special interest in greater depth with a selected preceptor. Permission of instructor is required to elect the course at any time other than section 41 of the fall term. Credit: 4. Enrollment: min 1. Prerequisites: instructor approval and satisfactory completion of PSC-205C. *Kudler*

**PSYCHTRY-443C. CLINICAL ASPECTS OF ALCOHOL AND DRUG ABUSE.** This course offers students experience in the outpatient treatment of patients with substance use disorders. Students are based at the Durham VAMC Substance Abuse Outpatient Program (VA-SAOP), with exposure at other Duke-affiliated treatment facilities. Emphasis is placed on understanding the relationships between addictive disorders and other psychiatric conditions and between addictions treatment and general medical care. Experiences include diagnostic evaluation, pharmacological management, and individual, group, and family psychotherapy. Students function as members of the multidisciplinary treatment team at either site. Credit: 4. Enrollment max 1. Prerequisites: instructor approval and satisfactory completion of PSC-205C. *Stein.*

**PSYCHTRY-445C. CONSULTATION-LIAISON PSYCHIATRY.** The consultation-liaison services at both Duke Medical Center and VA Hospital offer clinical clerkships in the management of psychological problems of medical patients and somatic symptoms in psychiatric patients. The student does psychiatric consultations in various specialized medical and surgical services under supervision of residents and senior staff. Emphasis is placed on training the student in advanced interviewing techniques and in assessment and intervention for psychological reactions or depression due to medical illness. The site selected and the specific specialty area chosen depend on the availability and location of psychiatric consultants with those interests. The rotation is flexible. We try to match student interests with the interests of available consultants. Students need to check with Dr. Moore (VA) or Dr. Varia (Duke) four weeks in advance on the current availability on this rotation. Prerequisites: instructor approval and satisfactory completion of PSC-205C. Credit: 4. Enrollment: max 1. *Varia*

## RADIATION ONCOLOGY

### 2nd Year Selective

**RADONC-220C. BRIEF EXP. IN CLINICAL RADIATION/ONCOLOGY.** Radiation therapy plays an important role in the care of patients with cancer. Students will begin this course with an orientation lecture, review of an educational syllabus, and several audio-visual educational programs. This will be followed by clinical instruction in the ambulatory clinics of the radiation oncology department at Duke. Students will have an opportunity to observe/participate in the evaluation, treatment planning, and care of patients before, during, and after their radiation. *Larrier*

### Basic Science Electives

**RADONC-327B. GENERAL RADIOBIOLOGY.** This course provides a comprehensive overview of radiation's interactions with cells and/or tissues and is oriented toward gaining an understanding of such interactions as they relate to the therapeutic use of radiation alone or in combination with chemotherapeutic drugs. Topics that are covered include carcinogenesis; radiation protection mutagenesis; DNA damage and repair; oncogene, suppressor gene and growth factor expression; methods for quantitating radiation damage in vitro and in vivo; tumor and normal tissue models for radiation studies; solid tumor metabolism, microenvironment, and physiology; radiation sensitizers and protectors; effects at the tissue and whole organ and whole organism level; time, dose, and fractionation; low dose rate radiotherapy, including use of radio-labeled monoclonal antibodies; hyperthermia; radiation/

drug and heat/drug interactions. See instructor for start date of class. Prerequisite: permission of instructor. Offering depends on student interest. Credit: 2. Enrollment: max 10. *Dewhirst*

### 2nd Year Clinical Elective

**RADONC-255C. CLINICAL RADIATION ONCOLOGY.** Radiation oncology plays a crucial role in the management of patients with cancer. The student begins this course with lectures, individual tutorials, and audio-visual education programs to review the crucial elements of radiation biology, medical radiation physics, and dosimetry. This is followed by clinical instruction based in the ambulatory clinics of the Radiation Oncology Department as well as participation in brachytherapy procedures, care of inpatients, and new patient consultations. This course provides an introduction to the role of radiation therapy in the treatment of malignant disease. Credit: 4. Enrollment: max 2. *Larrier and staff*

### 4th Year Clinical Elective

**RADONC-415C. CLINICAL RADIATION ONCOLOGY.** Radiation oncology plays a crucial role in the management of patients with cancer. The student begins this course with lectures, individual tutorials, and audio-visual education programs to review the crucial elements of radiation biology, medical radiation physics, and dosimetry. This is followed by clinical instruction based in the ambulatory clinics of the Radiation Oncology Department as well as participation in brachytherapy procedures, care of inpatients, and new patient consultations. This course provides an introduction to the role of radiation therapy in the treatment of malignant disease. Credit: 4 or 8. Enrollment: max 2. *Larrier and staff*

## RADIOLOGY

### 2nd Year Selective

**RADIOL-221C. INTRODUCTION TO RADIOLOGY.** This selective is designed to introduce students to the field of radiology. Students will be exposed to different imaging modalities in radiology. The goal is for students to understand when to use different modalities for patient care. While students will observe radiologist interpreting films, interpretation is not the focus of this selective. Please check in with Miss Cudic. Max 35, Min 1. *Nancy Major*

### Basic Science Elective

**RADIOL-335B. INTRODUCTION TO DIAGNOSTIC ULTRASOUND.** This elective is for medical students who wish to learn the use of sonography as a diagnostic skill with the goal of being able to employ sonography as a guide for simple procedures and as a supplement to the physical examination. Credit: 3. Enrollment: max 5, min 2. *Bowie*

### 2nd Year Clinical Electives

**RADIOL-250C. THORACIC IMAGING.** This course will provide the ability to interpret chest radiographs and increase the student's confidence in diagnosing cardiac and pulmonary diseases from chest films. Through formal teaching sessions and case presentations, as well as daily interactions with surgical and medical clinical teams, the student will be exposed to the broad range of modalities and interventional procedures conducted by the thoracic imaging division. Opportunities exist to become involved in research projects. During the course of one month, the student will have interpreted or observed the reading of more than 1,000 chest radiographs. Credit: 4. Enrollment: max 1. *Goodman and staff*

**RADIOL-251C. CLERKSHIP IN NEURORADIOLOGY.** A specialized program of detailed instruction in neuroradiology. The program includes participation in many interdepartmental conferences and the performance and interpretation of a variety of examinations including cerebral angiography, computerized axial tomography, magnetic resonance images, and myelography. Credit: 4. Enrollment: max 2. *Eastwood and staff*

**RADIOL-252C. PEDIATRIC RADIOLOGY.** A specialized program of instruction and participation in the wide variety of radiologic examinations in the pediatric age group. Special correlation of

these examinations to the problems of specific diagnosis and patient care is made. Credit: 4. Enrollment: max 2. *Carrico, Frush and staff*

**RADIOL-257C. MUSCULOSKELETAL IMAGING.** During this four week elective, the student will be exposed to conventional x-rays in bone radiology, emergency room bone films, bone tumor films and musculoskeletal MRI. At the conclusion, the student will be able to identify fractures and have a working knowledge of musculoskeletal radiology. A case presentation will be required. Credit 4. Enrollment: max. 2. *Major*

## 4th Year Clinical Electives

**RADIOL-420C. PEDIATRIC RADIOLOGY.** Pediatric radiology is unique from other radiology subspecialties in that all imaging modalities (plain film, ultrasound, fluoroscopy, CT, MR examinations) and all organ systems (e.g. brain, chest, gastrointestinal tract, musculoskeletal) are evaluated on a daily basis. Moreover, there are many disease processes and presentations that are unique to children. The importance of understanding embryology and normal versus abnormal development becomes evident. Students can learn by observing the radiology residents, fellows and attendings protocol, acquire, interpret and discuss pediatric imaging cases. The imaging modality (ies) used to evaluate a child's injury or illness is openly discussed on a case-by-case basis. Each clinical question is addressed, the history is reviewed and the exams are formulated to optimize obtainable information while minimizing patient risks (e.g. radiation exposure or need for sedation). Other learning tools include computer access to teaching file cases on PACS, American College of Radiology hard-copy teaching cases, online teaching files, daily case conferences and subspecialty case conferences.

Medical students are encouraged to ask questions and participate in preliminary film interpretation.

For each 2 weeks on service, one case is to be selected and briefly presented at an interesting case conference. This case will be added to the division's electronic teaching file. Credit: 4. Enrollment Max. 2. *Frush and staff*

**RADIOL-421C. CLERKSHIP IN NEURORADIOLOGY.** A specialized program of detailed instruction in neuroradiology. The program includes participation in many interdepartmental conferences and the performance and interpretation of a variety of examinations including cerebral angiography, computerized axial tomography, magnetic resonance images, and myelography. Credit: 4 or 8. Enrollment: max 2. *J Eastwood and staff*

**RADIOL-429C. BASIC RADIOLOGY CLERKSHIP.** This course is designed to provide an overview of the various imaging modalities of diagnostic radiology and their clinical utility. The elective consists of: (a) lectures and film interpretation sessions supplemented by student presentations; (b) assignment to a variety of diagnostic radiology services during which students observe the performance of diagnostic and interventional studies; and (c) use of a teaching file of radiographs and diagnostic images. One week is spent on the thoracic radiology service. Additional rotations may include the musculoskeletal, neuroradiology, mammography, vascular/interventional, pediatric, CT/abdominal imaging, ultrasound, nuclear medicine, gastrointestinal, and emergency radiology services. Credit: 4. Enrollment: min 4, max 12. *Major and staff*

**RADIOL-430C. THORACIC IMAGING.** This course will provide the ability to interpret chest radiographs and increase the student's confidence in diagnosing cardiac and pulmonary diseases from chest films. Through formal teaching sessions and case presentations, as well as daily interactions with surgical and medical clinical teams, the student will be exposed to the broad range of modalities and interventional procedures conducted by the thoracic imaging division. Opportunities exist to become involved in research projects. During the course of one month, the student will have interpreted or observed the reading of more than 1,000 chest radiographs. Prerequisite: Basic Radiology Clerkship elective preferred but not mandatory. Credit: 4. Enrollment: max 1. *Goodman and staff*

**RADIOL-437C. MUSCULOSKELETAL IMAGING.** During this four week elective, the student will be exposed to conventional x-rays in bone radiology, emergency room bone films, bone tumor films and musculoskeletal MRI. At the conclusion, the student will be able to identify fractures and have a working knowledge of musculoskeletal radiology. A case presentation will be required. Credit 4. Enrollment: max. 2. Major (and staff), *Helms, Spritzer, Cothran, and Vinson*

## STUDY AWAY

### 2nd Year Clinical Elective

**STDYAWAY-251C. STUDY AWAY AT UNC.** Second year study away

### 4th Year Clinical Electives

**STDYAWAY-411C. STUDY AWAY AT UNC.** Fourth year clinical elective at UNC.

**STDYAWAY-421C. STUDY AWAY AT WAKE FOREST UNIVERSITY SCHOOL OF MEDICINE.** Fourth year clinical elective at WFU.

**STDYAWAY-431C. STUDY AWAY AT EAST CAROLINA UNIVERSITY SCHOOL OF MEDICINE.** Fourth year clinical elective at ECU.

## SURGERY

### Required Course

**SURGERY-205C. SURGERY.** The required course in surgery is given in the second year and consists of an eight week clinical clerkship. The primary goal is to provide a rich experience in the discipline of surgery while introducing students to the practice and principles of surgery. The objectives of this course are satisfied in a variety of ways. Students are actively incorporated into the surgical services. Students are divided into two groups, one at Duke University and the other at the Veterans Administration Medical Center, and each works with Duke Surgical residents and members of the surgical faculty in the traditional surgical disciplines and surgical specialties. Students are assigned patients on the surgical wards where they serve a crucial role in the care, diagnosis, management, and follow-up of their patients. Clinical rounds are made daily and provide real-time patient care experience and instruction. The fundamental topics which form the foundation of surgical practice are presented at bi-weekly seminars with presentations by senior staff of the Duke University Department of Surgery. The subjects discussed include a broad range of topics in general, thoracic, transplant and vascular surgery in addition to the surgical specialties encompassing neurosurgery, orthopaedics, otolaryngology, plastic surgery, and urology/ Students are also given an opportunity to re-inforce their knowledge of anatomy and physiology. These fundamental principles are discussed during dissections of fresh tissue performed in the Duke University of Surgery Fresh Tissue Laboratory. Students are also given an opportunity to test their hand eye coordination in the Surgical Education and Activities Lab. The entire experience is consolidated during various sessions in experimental surgery, during which each student serves as the anesthesiologist, first assistant, and operating surgeon in performance of surgical procedures on experimental animals. Credit: 8. *Marroquin*

### 2nd Year Selectives

**SURGERY-220C. NEUROSURGICAL INTERVENTION IN THE MODERN ERA.** This neurosurgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive neurosurgery, including the subspecialties (cerebral aneurysm disease, intracranial malignancy in the adult, intracranial malignancy in the pediatric patient, benign intracranial tumors, peripheral nerve reconstruction, spinal surgery, traumatic brain injury, traumatic spinal cord injury). There will be didactic instruction with patient care exposure in the clinic setting, the Emergency Department, on the surgical wards and in the operating room. *Allan Friedman*

**SURGERY-221C. SURGICAL TREATMENT OF HEARING PROBLEMS & DISEASES OF THE HEAD AND HECK, FROM INFANTS TO ELDERLY.** This otolaryngology selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive head and neck surgery, including the subspecialties (pediatric, cholesteatoma and hearing loss, benign disease of the upper aerodigestive tract, malignant disease of the upper aerodigestive tract, reconstruction after tumor surgery, craniomaxillofacial, trauma). There will be didactic instruction with patient care exposure in the clinic setting, emergency department, outpatient surgery center and the operating room. *Esclamado*

**SURGERY-222C. ORTHOPEDIC SURGERY: FROM ELECTIVE TO EMERGENT, RECONSTRUCTION AND REHABILITATION.** This orthopedic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive ortho-

pedic surgery, including the subspecialties (hand, extremity salvage, soft tissue coverage, reconstructive microsurgery, sports medicine, benign and malignant bone tumors, trauma). There will be didactic instruction with patient care exposure in the clinic setting, outpatient surgery center and the operating room. *Levin, Erdmann, Georgiade, Marcus and Zenn*

**SURGERY-223C. FROM COSMESIS TO RECONSTRUCTION, FROM INFANTS TO THE ELDERLY.** This plastic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive plastic surgery, including the subspecialties (hand, aesthetics, extremity salvage, soft tissue coverage, craniomaxillofacial, reconstructive microsurgery). There will be didactic instruction with patient care exposure in the clinic setting, outpatient surgery center and the operating room. *Levin*

**SURGERY-224C. SURGICAL CRITICAL CARE IN THE MODERN ERA.** The Surgical Critical Care Selective introduces the second year medical student to the comprehensive care of the critically ill surgical patient. Students participate in the care of: the postoperative patient, the septic patient, the patient after multiple trauma, the patient suffering from multi-system organ failure, and the patient with acute lung injury/acute respiratory distress syndrome. Students are part of the Surgical Critical Care team. Students present on rounds, participate in didactic sessions, and experience direct patient care exposure in the Surgical Intensive Care Unit (SICU) setting. *Sebastian*

**SURGERY-225C. MODERN THORACIC SURGERY: FROM RESECTION AND STAGING TO GENE THERAPY.** This thoracic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive thoracic surgery, including the subspecialties (benign and malignant thoracic tumors, trauma, disorders of the esophagus, tracheal reconstruction, thoracoscopic intervention, tumor staging and novel therapeutic strategies). There will be didactic instruction with patient care exposure in the clinic setting, outpatient surgery center and the operating room. *D'Amico*

**SURGERY-226C. MODERN CARDIAC SURGERY: FROM CABG TO GENE THERAPY.** This cardiothoracic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive cardiac and thoracic surgery, including the subspecialties (adult ischemic Coronary Artery Bypass Grafting (CABG), adult valvular surgery, heart and lung transplantation, minimally invasive cardiothoracic surgery, congenital cardiac repair, redo cardiothoracic surgery, robotic cardiac surgery). There will be didactic instruction with patient care exposure in the clinic setting, outpatient surgery center and the operating room. Enrollment Max. 2. *Milano*

**SURGERY-227C. UROLOGY: SURGICAL TRTMNT OF BENIGN UROGENITAL PROBS & MALIGNANT DISEASES IN UROGENITAL TRACT..** This urology selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive urologic surgery, including the kidneys, ureters, bladder and male reproductive system and its subspecialties (pediatric, incontinence in the male and the female, sexual dysfunction, benign disease of the urogenital tract, malignant disease of the urogenital tract, reconstruction after tumor surgery, trauma). There will be didactic instruction with patient care exposure in the clinic setting, emergency department, outpatient surgery center and the operating room. *Maloney*

**SURGERY-229C. EARLY EXPERIENCES IN EMERGENCY MEDICINE.** The American College of Emergency Physicians defines emergency medicine as "the medical specialty with the principal mission of evaluating, managing, treating and preventing unexpected illness and injury." In this selective, students will gain a firsthand exposure to the approach to the undifferentiated emergency medical patient, including essential diagnostic and therapeutic measures. Students will be paired with emergency medicine attending physicians or senior emergency medicine residents to gain exposure to the principles of emergency diagnosis, treatment, and disposition. Credit 2. max 2. *Joshua Broder*

## 2nd Year Clinical Electives

**SURGERY-250C. GENERAL SURGICAL ONCOLOGY.** The course is designed for the student interested in surgical oncology. The students are involved in patient care with a specific surgeon but, in addition, are expected to attend multidisciplinary conferences related to gastrointestinal and breast carcinoma. These multidisciplinary conferences involve medical and radiation oncology as well as surgical oncology. The student is also expected to evaluate surgical patients in an outpatient setting

as well as participating in inpatient and operative patient care. This course is designed for students who have an interest in the basic sciences in relation to surgical oncology. Attendance at research conferences involved in the molecular and cellular biology of human cancers is also expected. Permission of instructor is required. Credit: 4. Enrollment: min 1, max 2. *Tyler, Leight, Seigler, Clary, Lyerly, Pruitt and Olson*

**SURGERY-252C. EMERGENCY MEDICINE.** Course Goals: 1) This elective will provide exposure to emergency clinical problems. 2) Students will see patients of all ages with the full range of chief complaints that present to the Duke University Emergency Department. 3) Students will gain experience in making initial evaluations as well as diagnostic and treatment plans with an emphasis on detecting and treating immediate life threatening conditions. 4) Their ability to rapidly obtain critical facets of a history and physical examination will improve. 5) Students will mature as clinical problem-solvers by seeing several patients per day with undifferentiated chief complaints. How Goals Are Achieved: 1) Students will present to attendings and residents during approximately 18 ten-hour shifts per month. A mixture of day, evening, and overnight shifts will be assigned. 2) Didactic sessions will be held weekly. 3) Students will present one 15-minute lecture per month on a case/topic of interest. 4) Students will shadow a Durham EMS paramedic team for one day. Methods of Evaluation: Attendings will give feedback to students. Prerequisites: none. Credit: 4. Enrollment: max 6. *Broder*

**SURGERY-253C. TRAUMA SERVICE.** This course is designed to provide students interested in trauma care with further experience both in the Emergency Department and on the Inpatient Trauma Service. The course emphasizes both triage and resuscitation for major and minor emergency problems in the Emergency Department and also pre- and postoperative care on the Inpatient Trauma Service. The student has a full-time experience by assuming duties and responsibilities similar to a junior intern. Emphasis is placed on developing skills in the care of patients with multi-system injuries in the Emergency Department, Inpatient Service, and Operating Room. Students work in conjunction with the attending staff and the residents on the Trauma Service. Credit: 4. Enrollment: max 2. *Vaslef, Georgiade, and Sebastian*

**SURGERY-254C. INTRODUCTION TO PLASTIC, RECONSTRUCTIVE AND MAXILLOFACIAL SURGERY.** This course is designed for students who may have a future interest in plastic surgery. Duties include the preoperative evaluation of patients, assisting in the operating room, making daily ward rounds, and participation in conferences. Credit: 4. Enrollment: max 3. *Levin, Zenn, Marcus and Erdmann*

**SURGERY-256C. ADVANCED CLERKSHIP IN PEDIATRIC SURGERY.** This course is designed to familiarize the student with the whole range of surgical problems in children, but with emphasis on the pathophysiology of surgical and related problems in the newborn infant and the total care of the child with a malignancy. The student is encouraged to participate fully in the patient care aspects of the service and is considered an integral part of the patient care team. Prerequisite: brief pre-enrollment interview with Dr. Michael Skinner. Credit: 4. Enrollment: max 1. *Skinner*

**SURGERY-257C. ADVANCED UROLOGIC CLERKSHIP.** The diagnosis, management, and surgical treatment of patients with urologic disorders are stressed. Students are afforded intimate association with the entire staff in the clinics, wards, and operating rooms, and participate in surgery. Cystoscopic and urographic diagnostic methods along with other techniques are taught. Credit: 4. Enrollment: max 3. *Preminger, Paulson, Albala, Anderson, Wiener, Webster, Donatucci, Walther, and Robertson*

**SURGERY-258C. CLERKSHIP IN PEDIATRIC UROLOGY.** The course is designed to give an overview of congenital and acquired urologic problems in children. Students participate in outpatient clinics, ward rounds, and the operating room to gain experience in the diagnosis and management of children with urologic disease. Credit: 4. Enrollment max:1. *Wiener*

**SURGERY-263C. ADVANCED SURGERY-EMPHASIS CARDIOVASCULAR/THORACIC.** Advanced concepts in surgery are presented in seminars and in ward, clinic, and operating room experiences. Fifty to 75 percent of the time is devoted to cardiovascular/thoracic surgery and related basic topics and the remainder to surgery generally. Credit: 4. Enrollment: min 2, max 5. *D'Amico, Burfeind, Davis, Glower, Harpole, Hughes, Jaggers, Lin, Lodge, Lowe, Milano, Simsir, Smith, Toloza, Wolfe*

**SURGERY-265C. CLINICAL NEUROSURGERY.** The course is designed for those students with a career interest in one of the neurological sciences. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, daily rounds, and night call. Weekly conferences are held in neurosurgery, neurology, neuropathology, and neuroradiology. There are also special lectures. Permission of instructor is required. Credit: 4. Enrollment: max 2. *Friedman and Neurosurgery Staff*

**SURGERY-269C. CLINICAL OTOLARYNGOLOGY.** This course provides the student with a comprehensive survey of clinical otolaryngology. Duties include participation in both outpatient clinic activities and inpatient care in addition to assisting in the operating room. The student participates in ward rounds and in various conferences held by the division. Credit: 4. Enrollment: max: 2. *Esclamado, Fisher, Scher, Witsell, Tucci, and Hulka*

**SURGERY-270C. INTRODUCTION TO THE SURGICAL INTENSIVE CARE UNIT.** This course is designed for second year medical students to allow students a four-week elective experience in the Surgical Intensive Care Unit (SICU). Under supervision of a multidisciplinary Faculty consisting of Attendings from the Department of Surgery, Medicine and Anesthesia, the student participates in the care of critically ill adult patients admitted to the SICU. Emphasis is placed on the development of the pathophysiologic approach to the diagnosis and therapy of broad spectrum of patients admitted to the SICU for postoperative care, treatment of traumatic injury, and support of organ failure. Advanced concepts in adult critical care are emphasized, including the modern treatment of Acute Lung Injury (ALI), Multiple Organ Failure, and overwhelming infection. This course will count for fourth year critical care requirement. Prerequisite: SURG 205C. Credit: 4. Enrollment: max 2. *Sebastian, Tuttle, Vaslef, Govert, Knudsen, Moretti, Young*

**SURGERY-279C. GENERAL PRINCIPLES OF ORTHOPAEDICS.** A full experience on the Orthopaedic Service with duties and responsibilities similar to a first year resident. Inpatient care, outpatient examination, operating room experience, and emergency room call are included. Conference attendance is required. Individual or group discussions are conducted each day with attending staff/residents. The purpose of the course is to present broad concepts of orthopaedics to students planning general practice, pediatrics, allied surgical specialties, or orthopaedics. Credit: 4. Enrollment: max 2 for 4 weeks. *Nunley, orthopaedic staff and house staff.*

## 4th Year Clinical Electives

**SURGERY-401C. ADVANCED SURGICAL CLERKSHIP.** This course is structured to provide the student with a comprehensive approach to surgical disorders. Each student works in the clinics, on the wards, and in the operating rooms side by side with one senior surgeon to be selected from the approved list below. Credit: 5 or 10. *Marroquin, Pappas, Clary, Collins, D'Amico, Davis, Desai, Hughes, Jaggers, Kuo, Lin, Lowe, Ludwig, Lyerly, Mantyh, McCann, Olson, Pickett, Sebastian, Smith, Tuttle-Newhall, Tyler, Vaslef, and Wolfe*

**SURGERY-402C. EMERGENCY MEDICINE SUBINTERNSHIP.** The American College of Emergency Physicians defines emergency medicine as "the medical specialty with the principal mission of evaluating, managing, treating and preventing unexpected illness and injury." In this internship, students will hone their approach to the emergency medical patient, including essential diagnostic and therapeutic measures. The experience will emphasize differential diagnosis of undifferentiated chief complaints including chest pain, dyspnea, headache, abdominal pain, altered mental status, vaginal bleeding, toxic exposure, and trauma. Students will participate in patient care in the emergency department, attend didactic sessions, and work closely with senior residents and attendings in the emergency department. Credit: 5. max 2. *Joshua Broder*

**SURGERY-412C. EMERGENCY MEDICINE.** Course Goals: 1) This elective will provide exposure to emergency clinical problems. 2) Students will see patients of all ages with the full range of chief complaints that present to the Duke University Emergency Department. 3) Students will gain experience in making initial evaluations as well as diagnostic and treatment plans with an emphasis on detecting and treating immediate life threatening conditions. 4) Their ability to rapidly obtain critical facets of a history and physical examination will improve. 5) Students will mature as clinical problem-solvers by seeing several patients per day with undifferentiated chief complaints. How Goals Are

Achieved: 1) Students will present to attendings and residents during approximately 18 ten-hour shifts per month. A mixture of day, evening, and overnight shifts will be assigned. 2) Didactic sessions will be held weekly. 3) Students will present one 15-minute lecture per month on a case/topic of interest. 4) Students will shadow a Durham EMS paramedic team for one day. Methods of Evaluation: Attendings will give feedback to students. Prerequisites: none. Credit: 4. Enrollment: max 8. *Broder*

**SURGERY-420C. GENERAL SURGICAL ONCOLOGY.** The course is designed for the student interested in surgical oncology. The students are involved in patient care with a specific surgeon but, in addition, are expected to attend multidisciplinary conferences related to gastrointestinal and breast carcinoma. These multidisciplinary conferences involve medical and radiation oncology as well as surgical oncology. The student is also expected to evaluate surgical patients in an outpatient setting as well as participating in inpatient and operative patient care. This course is designed for students who have an interest in the basic sciences in relation to surgical oncology. Attendance at research conferences involved in the molecular and cellular biology of human cancers is also expected. Permission of instructor is required. Credit: 4. Enrollment: min 1, max 2. *Tyler, Leight, Seigler, Lylerly, and Clary*

**SURGERY-421C. INTRODUCTION TO FRACTURES AND MUSCULOSKELETAL TRAUMA.** Students participate in the emergency management of patients through the Duke Emergency Room. Principles of fractures and trauma are given during emergency room assignment. Requirements are attendance at one outpatient clinic per week, two nights per week on call in the emergency room, and conference attendance. Credit: 3. Enrollment: max 2 for four weeks (if proportionate with #'s on 429C). *Nunley, Olson, Duke Orthopaedic Staff*

**SURGERY-423C. ADVANCED SURGERY-EMPHASIS CARDIOVASCULAR/THORACIC.** Advanced concepts in surgery are presented in seminars and in ward, clinic, and operating room experiences. Fifty to 75 percent of the time is devoted to cardiovascular/thoracic surgery and related basic topics and the remainder to surgery generally. Credit: 8. Enrollment: min 2, max 5. *Smith, Burfeind, D'Amico, Davis, Glower, Harpole, Hughes, Jaggers, Lin, Lodge, Lowe, Milano, Simsir, Toloza, and Wolfe*

**SURGERY-426C. ADVANCED CLERKSHIP IN PEDIATRIC SURGERY.** This course is designed to familiarize the student with the whole range of surgical problems in children, but with emphasis on the pathophysiology of surgical and related problems in the newborn infant and the total care of the child with a malignancy. The student is encouraged to participate fully in the patient care aspects of the service and is considered an integral part of the patient care team. This is a four week experience is probably optimal for most students. It may be combined with other advanced surgical clerkships such as SURGERY-401c or with four weeks of neonatology (PEDS-426C) or other courses depending on the interests of the student. Prerequisite: brief pre-enrollment interview with Dr. Michael Skinner. Credit: 4 or 8. Enrollment: max 1. *Skinner*

**SURGERY-427C. ADVANCED UROLOGIC CLERKSHIP.** The diagnosis, management, and surgical treatment of patients with urologic disorders are stressed. Students are afforded intimate association with the entire staff in the clinics, wards, and operating rooms, and participate in surgery. Cystoscopic and urographic diagnostic methods along with other techniques are taught. Credit: 4 or 8. Enrollment: max 3. *Preminger, Paulson, Albala, Anderson, Wiener, Webster, Donatucci, Walther, and Robertson*

**SURGERY-428C. CLERKSHIP IN PEDIATRIC UROLOGY.** The course is designed to give an overview of urologic problems in the pediatric population. It includes patient contact and seminar material as well as ward and operating room experience in the diagnosis, treatment, and long-term follow-up of children with urologic disease. Credit: 4. Enrollment: min 1, max 2. *Wiener*

**SURGERY-429C. GENERAL PRINCIPLES OF ORTHOPAEDICS.** A full experience on the Orthopaedic Service with duties and responsibilities similar to a first year resident. Inpatient care, outpatient examination, operating room experience, and emergency room call are included. Conference attendance is required. Individual or group discussions are conducted each day with attending staff/residents. The purpose of the course is to present broad concepts of orthopaedics to students planning general practice, pediatrics, allied surgical specialties, or orthopaedics. Credit: 4. Enrollment: max 4 for 4 weeks. summer term, section 41 enrollment max = 2. *Nunley, orthopaedic staff and house staff.*

**SURGERY-430C. INTRODUCTORY CLINIC COURSE IN CHILDREN'S ORTHOPAEDICS.** This introductory clinic course is arranged for those interested in pediatric orthopaedic problems, neurological disease, and related fields. The course gives the student a working experience in the examination and evaluation of clinical outpatients, inpatients, and surgical patients. It demonstrates both the individual and multidisciplined group approach to the whole patient with complex orthopaedic and neurologic conditions as they affect growth, development, and rehabilitation. Credit: 4. Enrollment: max 2 for four weeks. *Fitch and Lenox Baker Children's Hospital staff*

**SURGERY-435C. CLINICAL NEUROSURGERY.** The course is designed for those students with a career interest in one of the neurological sciences. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, daily rounds, and night call. Weekly conferences are held in neurosurgery, neurology, neuropathology, and neuroradiology. There are also special lectures. Credit: 4 or 8. Enrollment: max 4. *Friedman and Neurosurgery Staff*

**SURGERY-436C. INTERMEDIATE CLINICAL NEUROSURGERY.** This elective, intended as an intermediate experience that focuses on the clinical presentation of common neurosurgical disorders, radiographic evaluation, and therapeutic options including the indications and contraindications for surgical intervention. The student works up one to three patients and assists at their operations the following day either once or twice per week, and attends the Saturday, neurosurgical conference. Credit: 1 or 2. Enrollment: max 1. *Friedman, Turner, Fuchs, Haglund, George, Sampson, Alexander, and Osenbach*

**SURGERY-439C. CLINICAL OTOLARYNGOLOGY.** This course provides the student with a comprehensive survey of clinical otolaryngology. Duties include participation in both outpatient clinic activities and inpatient care in addition to assisting in the operating room. The student participates in ward rounds and in various conferences held by the division. Credit: 4. Enrollment: max: 2. *Esclamado, Cohen, Evans, Farmer, Fisher, Hulka, Scher, Tucci, and Witsell*

**SURGERY-441C. SURGICAL INTENSIVE CARE.** This course is designed to broaden the student's knowledge and experience in dealing with critically ill patients. Under supervision, students function as sub-interns in the Surgical Intensive Care Unit (SICU). Students are assigned their own patients and actively participate in daily rounds as part of the SICU team. There is a morning lecture on aspects of critical care each day. Students take call one night in four and work on a one-on-one basis with SICU house staff in the supervised management of critically ill patients. Four weeks are spent in the SICU at Duke University Medical Center (trauma, vascular surgery, liver-kidney-pancreas transplantation, general surgery). There is emphasis on teaching of procedures and techniques necessary for the management of all critically ill patients including hemodynamic assessment and monitoring, cardiovascular resuscitation and use of vasoactive drugs, ventilator management including ARDS, prevention and management of nosocomial infections, and nutritional support. Students are formally evaluated by the SICU house staff and the attending physician. C-L: ANESTH-441C. Credit: 5. Enrollment: max 2. *Sebastian, Vaslef, Tuttle-Newhall, and staff*

**SURGERY-443C. TRAUMA SERVICE.** This course is designed to provide students interested in trauma care with further experience both in the Emergency Department and on the Inpatient Trauma Service. The course emphasizes both triage and resuscitation for major and minor emergency problems in the Emergency Department and also pre- and postoperative care on the Inpatient Trauma Service. The student has a full-time experience by assuming duties and responsibilities similar to a junior intern. Emphasis is placed on developing skills in the care of patients with multi-system injuries in the Emergency Department, Inpatient Service, and Operating Room. Students work in conjunction with the attending staff and the residents on the Trauma Service. Credit: 4. Enrollment: max 2. *Vaslef, Georgiade, and Sebastian*

**SURGERY-444C. INTRODUCTION TO PLASTIC, RECONSTRUCTIVE AND MAXILLOFACIAL SURGERY.** This course is designed for students who may have a future interest in plastic surgery. Duties include the preoperative evaluation of patients, assisting in the operating room, making daily ward rounds, and participation in conferences. Credit: 4. Enrollment: max 5. *Levin, Zenn, Marcus and Erdmann*

**SURGERY-445C. PEDIATRIC CARDIAC SURGERY.** The student becomes an active member of the surgical team caring for infants and children with congenital heart defects. Responsibilities include ward work and participation during surgery. This student is involved in perioperative decision making. Weekly formal didactic sessions are conducted. Credit: 4. Enrollment: max 2. *Jaggers*

**SURGERY-446C. CLERKSHIP IN PLASTIC AND RECONSTRUCTIVE SURGERY.** The student participates in evaluation and management of plastic surgery patients including preoperative assessment, surgical assistance, and postoperative follow-up in the Division of Plastic Surgery at Duke North. Daily seminars cover core topics such as skin and surgical techniques, wound healing, and scars. Credit: 4. Enrollment: max 3. *Levin, Zenn, Marcus and Erdmann*

### THESIS

### Basic Science Elective Requirement

**THESIS-301B. THESIS AND MEDICAL STATISTICS.** Graduation from Duke School of Medicine (or continuation with fourth year rotations after completion of third year research) requires completion of an acceptable thesis describing quantitative research. The thesis is in the form of a manuscript of 15-20 double-spaced pages, in addition to any relevant figures. It should include an abstract, introduction with hypothesis, materials and methods, discussion, results and references. The cover page is signed by the student, the mentor and the study program director and must be submitted to the third year coordinator by mid-April for eight-month students and mid-August of the student's fourth year for 12-month students. In addition, students must post the thesis in its entirety on a pdf database for review by the study program directors. Instructions on posting theses and details on the formatting of the thesis are located on the Thesis Requirements tab of the third year website: http://third-year.mc.duke.edu. The thesis will receive a separate grade and number of credits from the research course. Credit: 3. *Staff*

# Special Interdisciplinary Training Programs

# Anesthesiology, Surgery and Environmental Physiology

**ASEP-301B. RESEARCH IN ASEP.** Anesthesiology, Surgery and Environmental Physiology ASEP-301B. RESEARCH IN ASEP. Program Directors: Kathryn P. King, M.D.(Coordinating Director); Richard Moon, M.D.; Bryant W. Stolp; M.D., Ph.D.; David S. Warner, M.D. While the university offers a range of opportunities from biochemistry to organ physiology, anesthesiology, surgery and critical care integrates these multiple systems into a larger perspective of human pathophysiology and pharmacology. Students have opportunities for research in cardiovascular and respiratory physiology, molecular pharmacology, neurobiology, and environmental science. Regardless of ultimate career choice, investigation in anesthesiology, surgery and critical care medicine provides strong basic science grounding and application of research principles. An area of independent study is defined and a hypothesis proposed as part of an ongoing interaction between the student and the laboratory mentor. Necessary methodological skills are learned by the student early in the course of study to allow data acquisition for subsequent analysis and interpretation. As the year progresses, students participate in "work in progress" seminars that focus on the development of scientific information. Emphasis is placed on experimental design and statistical analysis. At the end of the year, each student is expected to have completed a project of sufficient merit to warrant presentation and publication. Further, the Department of Anesthesiology offers a unique opportunity for the students to present their projects in a formal setting moderated by an external reviewer of national stature. Additional courses in Physiology and Medicine of Extreme Environments are available for interested students. Students meet periodically with the Coordinating Director individually to monitor progress in the laboratory and also during every two month ASEP group meetings, held over hosted lunches. FACULTY: David L. Albala, M.D.; Richard L. Auten, Jr., M.D.; Yehia Daaka, Ph.D.; Tong J. Gan, M.D.; Hilary P. Grocott, M.D., F.R.C.P.C.; Elliott Bennett-Guerrero, M.D.; Kathryn P. King, M.D.; Stephen M. Klein, M.D.; Madan M. Kwatra, Ph.D.; Sandhya A. Lagoo-Deenadayalan, M.D.; Ph.D.; Jeffery H. Lawson, M.D., Ph.D.; Terri Monk, M.D.; Richard Moon, M.D.; David Needham, Ph.D.; Laura E. Niklason, M.D., Ph.D.; Claude A. Piantadosi, M.D.; Thomas Polascik, M.D.; Glenn M. Preminger, M.D.; James D.

Reynolds, Ph.D.; Debra A. Schwinn, M.D.; Sidney A. Simon, Ph.D.; Mark Stafford-Smith, M.D.; Bryant W. Stolp, M.D.; Richard D. Vann, Ph.D.; David S. Warner, M.D.

# Behavioral Neurosciences Study Program

**BSP-301B. RESEARCH IN BSP.** BEHAVIORAL NEUROSCIENCES STUDY PROGRAM (BSP) Program Director: Andrew D. Krystal, M.D., M.S. This study program is designed to help third year medical students obtain an integrative understanding of the basic processes underlying normal and pathological human and laboratory animal behavior. The course and preceptorship offerings familiarize students with significant developments in the behavioral neurosciences, investigative methodology used to examine human behavior and its neurobiological underpinnings, and the application of these findings to medicine. As an example, they are provided with the neuroanatomical, histochemical, neuroimmunological, neuropharmacological, and neurobehavioral basis of prescribing anxiolytics, antidepressants, and other neurotropic drugs. Students are encouraged to select an area of research concentration and then arrange to match their interests with a faculty member as a research preceptor by discussing the array of options with the study program director. They are given the opportunity to focus on some determinant of human behavior which may include neurobiological, developmental, or psychosocial factors. Students may choose to spend a significant portion of their time in a closely supervised laboratory with associated library research in an area of the student's interest resulting in a published report of the work. Specific science interests can be augmented through seminars, guided readings, and appropriate courses providing a greater familiarity with current issues in the biobehavioral sciences. The following course work is recommended for all students: PSYCHTRY 223B, Neurobehavioral Basis of Behavior. The courses listed below, although not required, are recommended for consideration: PSYCHTRY 360B, Neuropharmacology; PHARM 372B, Cellular Endocrinology; NEUROBIO 270B, Neurobiology; PSYCHTRY 213B, Human Development I. Birth through Adolescence; PSYCHTRY 215B, Comparative Personality Theory. Alternatives to the intensive laboratory research concentration are also offered. In addition to courses in the Department of Psychiatry, students may take courses offered through the Medical and Graduate Schools. FACULTY: James A. Blumenthal, Ph.D.; Sheila Collins, Ph.D.; P. Murali Doraiswamy, M.D.; Everett H. Ellinwood, Jr., M.D.; Jau-Shyong Hong, Ph.D.; K. Ranga Krishnan, M.B., Ch.B.; Andrew D. Krystal, M.D., M.S.; Cynthia M. Kuhn, Ph.D.; Edward D. Levin, Ph.D.; David J. Madden, Ph.D.; Roy J. Mathew, M.B.; Jeffrey R. Petrella, M.D.; Jed E. Rose, Ph.D.; Saul M. Schanberg, M.D., Ph.D.; Susan S. Schiffman, Ph.D.; Rochelle D. Schwartz-Bloom, Ph.D.; Andrew Sherwood, Ph.D.; David C. Steffens, M.D., M.H.S.; Kamaraju S. Sundar, Ph.D.; Richard S. Surwit, Ph.D.; Marvin S. Swartz, M.D.; Richard D. Weiner, M.D., Ph.D.; William C. Wetsel, Ph.D.; Redford B. Williams, M.D.

# Biomedical Engineering Study Program

**BES-301B. RESEARCH IN BES.** Program Directors: Bruce Klitzman, Ph.D. (Coordinating Director), and Farshid Guilak, Ph.D. This interdepartmental study program is designed to provide third year students with an opportunity to perform basic science research in the broad area of biomedical engineering. The program is designed to provide research opportunities to students interested in the quantitative understanding of the physiology of cells, tissues, organs, organ systems, and populations, as well as the efficacy of various therapies. The mentors have research laboratories that investigate these areas at the microscopic and macroscopic levels. The course of study usually emphasizes either the employment of whole animal models or in vitro simulation of disease states. The development and employment of new instrumentation may be a component of the research effort, but not its exclusive objective. Emphasis in the student experience is placed upon the teaching of the quantitative method of understanding biological systems. The student is expected to learn to formulate hypotheses, to develop appropriate methods to test such hypotheses and to use statistical methods to draw conclusions form their data. Each student selects a faculty preceptor in consultation with the study program director and an individual research plan is developed. Students who wish to enter this program are not required to have an engineering background. FACULTY: Roger C. Barr, Ph.D.; Delve Erdmann, MD, PhD; Robert D. Fitch, M.D.; Morton H. Friedman, Ph.D.; Farshid Guilak, Ph.D.; Craig S. Enrique, Ph.D.; Lawrence Higgins, M.D.; Bruce Klitzman, Ph.D.; Andrew D. Krystal, M.D.; Jeffrey H. Lawson, M.D.,

Ph.D.; L. Scott Levin, M.D.; Nancy Major, MD; Roger L. Miller, Ph.D.; Srinivasan Mukundan, MD; Barry S. Myers, M.D., Ph.D.; Laura E. Niklason, M.D., Ph.D.; James A. Nunley, M.D.; Steven Olson, M.D.; Ricardo Pietrobon, M.D.; Glenn Preminger, M.D.; Daniel Schmitt, M.D.; Debra A. Schwinn, M.D.; Lori A. Setton, Ph.D.; David W. Smith, Ph.D.; Peter K. Smith, M.D.; Gregg Trahey, Ph.D.; George A. Truskey, Ph.D.; Thomas P. Vail, M.D.; Olaf T. von Ramm, Ph.D.; Patrick D. Wolf, Ph.D.; Fan Yuan, Ph.D.

# Biomedical Imaging & Medical Physics Study Program

**BIMP-301B. RESEARCH IN BIMP.** Biomedical Imaging and Medical Physics Study Program BIMP-301B. RESEARCH IN BIMP Program Director: Joseph Y. Lo, Ph.D. This program encourages medical students to explore many exciting research topics in radiology and imaging, such as magnetic resonance microscopy, molecular imaging, breast ultrasound, and nuclear medicine. Students have the opportunity to work with a diverse group of research and clinical faculty from radiology as well as biomedical engineering and physics. The program strongly emphasizes the use of quantitative and engineering methods to solve clinically significant problems. Students may select from a broad array of research areas including tumor biology, digital image analysis, predictive modeling, computer aided diagnosis, imaging instrumentation, and medical physics, to name just a few. Each student selects a faculty preceptor in consultation with the program directors and designs an individual plan in cooperation with the preceptor and directors. The primary emphasis of each student's plan is expected to be research. Students may, however, also be advised to take an existing course or to set up a tutorial with a faculty member to fill in deficient areas or to acquire needed quantitative or engineering skills. Depending on the subject area selected, a student may initiate a new research project of limited scope or take over a well-defined part of an existing project. Students are expected to produce a thesis based on their work, and possibly (but not necessarily) a paper suitable for publication in a scientific journal. Students taking this program should have some prior training or experience in one or more of the following areas: mathematics, computer science, physics, chemistry, or engineering (electrical, mechanical, biomedical, etc.). FACULTY: Jay Baker, M.D.; H. Cecil Charles, Ph.D.; James T. Dobbins III, Ph.D.; Carey E. Floyd, Jr., Ph.D.; Laurence W. Hedlund, Ph.D.; Scott Huettel, Ph.D.; Ronald J. Jaszczak, Ph.D.; G. Allan Johnson, Ph.D.; Joseph Y. Lo, Ph.D.; James R. MacFall, Ph.D.; Edward F. Patz, Jr., M.D.; Martin P. Tornai, Ph.D.; Timothy G. Turkington, Ph.D.; Terry T. Yoshizumi, Ph.D.

# Biostatistics and Bioinformatics

**CRSP-301B. RESEARCH IN CLINICAL RESEARCH.** Clinical Research Study Program Coordinating Director: Galen S. Wagner; Christopher O'Connor, M.D., Co-Director. This study program offers students the opportunity to explore the quantitative and methodological principles of clinical research. Under the direction of two preceptors, typically a clinical investigator and a statistician, students use the methods and techniques of biostatistics and related disciplines to address a clinical research question. Designated courses may be taken with the approval of the student's preceptors. Students in this study program may apply for admission as degree candidates in the Clinical Research Training Program, earning a Master of Health Sciences in Clinical Research. FACULTY: Amy Abernathy, M.D., David Albala, M.D.; John Alexander, M.D., Kathryn M. Andolsek, M.D., M.P.H.; Jay Baker, M.D.; John Bartlett, M.D., Lori A. Bastian, M.D.; Dan G. Blazer, M.D., Ph.D.; Hayden Bosworth, Ph.D, Terrill Bravender, M.D.; Ann Brown, M.D., Haywood Brown, M.D.; Barbara J. Burns, Ph.D.; Marian Butterfield, M.D., Chris Cabell, M.D., Robert M. Califf, M.D.; Abhinav Chandra, M.D., Dennis A. Clements, M.D., Ph.D.; Harvey Cohen, M.D.; G. Ralph Corey, M.D., John M. Dement, Ph.D.; Rowena Dolor, M.D.; Robert Drucker, M.D., David Edelman, M.D.; Christopher Edwards, Ph.D.; Eric Eisenstein, D.B.A., Mark Feinglos, M.D.; Gerda Fillenbaum, Ph.D., Michael Freemark, M.D.; William Fulkerson, M.D.; Anthony Galanos, M.D., Linda K. George, Ph.D.; Deborah T. Gold, Ph.D.; Christopher Granger, M.D.; Carol Dukes Hamilton, M.D.; Robert A. Harrington, M.D., Victor Hasselblad, Ph.D., Caroline Haynes, M.D., Ph.D., Judith C. Hays, Ph.D.; Catherine Hoyo, M.D., Ph.D.; Margaret Humphreys, M.D., Ph.D.; James Jollis, M.D., Keith Kaye, M.D.; Sheri Keitz, M.D., Linda Kinsinger, M.D.; Harold Koenig, M.D.; Mitchell Krucoff, M.D., Paul Lee, M.D., J.D.; Hester Lipscomb, Ph.D.; Elizabeth Livingston, M.D.; Joseph Lo, Ph.D.; David Lobach, M.D., Ph.D.; Daniel

Mark, M.D., David B. Matchar, M.D.; Lloyd Mitchener, M.D.; John Murray, M.D.; Amy Murtha, M.D., Evan R. Myers, M.D., M.P.H.; Kristen Newby, M.D.; Chris Newgard, M.D.; Eugene Oddone, M.D., Maren Olsen, Ph.D., Maren Olsen, M.D., Steven Olson, M.D.; Truls Ostbye, M.D.; George Parkerson, M.D., Ph.D.; Eric Peterson, M.D.; Ricardo Pietrobon, M.D.; Don Rockey, M.D., John Sampson, M.D., Ph.D.; Joellen M. Schildkraut, Ph.D.; Kenneth Schmader, M.D.; Kevin A. Schulman, M.D., M.B.A.; Bill Scott, M.D.; Pearl Seo, M.D.; Dan Sexton, M.D., David L. Simel, M.D., M.H.S.; Cellette Skinner, Ph.D.; Frank Sloan, Ph.D.; Karen Steinhauser, Ph.D., Laura Svetkey, M.D.; Nathan Thielman, M.D.; James A. Tulsky, M.D.; Thomas Parker Vail, M.D., Samuel Wells, Ph.D., Eric Westman, M.D., M.H.S.; David Witsell, M.D., M.H.S.; Christopher Woods, M.D.

# Cancer Biology Study Program

**CBP-301B. RESEARCH IN CBP.** CANCER BIOLOGY STUDY PROGRAM. (CBP) Program Director: Matthias Gromeier, M.D. The Cancer Biology Study Program offers third year medical students a 32 credit program of basic science instruction. Each student has an opportunity to focus on an area of interest and pursue a scholarly activity. Through a combination of research preceptorship and classroom work, students are introduced to cancer research. The students may choose to investigate oncogenes, tumor suppressor genes, growth factors, chromosomal abnormalities, cellular invasion and metastases, tumor doubling time, cell loss, tumor hypoxia, tumor angiogenesis, chemical/radiation/foreign body/viral/tobacco carcinogenesis, biologic and immunotherapy principles, experimental cancer therapeutics, radiobiology and hyperthermic oncology, and the pharmacology of cancer chemotherapy. FACULTY: Andrew Berchuck, M.D.; Gerard C. Blobe, M.D., Ph.D.; Patrick J. Casey, Ph.D.; O. Michael Colvin; M.D.; Mark W. Dewhirst, D.V.M., Ph.D.; Henry S. Friedman, M.D.; Eli Gilboa, Ph.D.; James M. Grichnik, M.D., Ph.D.; Matthias Gromeier, M.D.; Edward C. Halperin, M.D.; Maureane R. Hoffman, M.D., Ph.D.; Randy L. Jirtle, Ph.D., Michael J. Kelley, M.D.; Sally A. Kornbluth, Ph.D.; Joanne Kurtzberg, M.D.; Jeffrey R. Marks, Ph.D.; Lawrence B. Marks, M.D.; Joseph R. Nevins, Ph.D.; Edward F. Patz, Jr., M.D.; Ann Marie Pendergast, Ph.D.; Salvatore V. Pizzo, M.D., Ph.D.; Hilliard F. Seigler, M.D.; Victoria Seewaldt, M.D.; Douglas Tyler, M.D.

# Cardiovascular Study Program

**CVS-301B. RESEARCH IN CVS.** Cardiovascular (CVS-301B. RESEARCH IN CVS) Program Director: Neil J. Freedman, M.D. This interdepartmental study program is designed to provide third-year medical students with an in-depth basic science research experience in one area of the broad discipline of cardiovascular science. Directed at students potentially interested in a career in cardiovascular research, this program affords a wide variety of opportunities for basic research under the guidance of a faculty mentor. Students in this program are not required to take any formal course work, but students interested in graduate-level courses may enroll in them if they have the permission of their faculty mentor. FACULTY: Page A.W. Anderson, M.D.; Marc G. Caron, Ph.D.; Neil J. Freedman, M.D.; Pascal J. Goldschmidt, M.D., F.A.C.C.; Augustus O. Grant, M.B., Ch.B.; Michael Gunn, M.D.; Barton F. Haynes, M.D.; Margaret Kirby, Ph.D.; Bruce M. Klitzman, Ph.D.; Christopher D. Kontos, M.D.; William E. Kraus, M.D.; F.C.C.P., Madan M. Kwatra, Ph.D.; Robert J. Lefkowitz, M.D.; Yin-Xiong Li, M.D., Ph.D.; Ann LeFurgey, Ph.D.; Anthony R. Means, Ph.D.; Claude A. Piantadosi, M.D.; Howard Rockman, M.D.; Jonathan S. Stamler, M.D.; Antonius M.J. VanDongen, Ph.D.; Xiao-Fan Wang, Ph.D.; R. Sanders Williams, M.D.; A. Richard Whorton, Ph.D.

# Epidemiology and Public Health Study Program

**EPH-301B. RESEARCH IN EPI & PUBLIC HEALTH.** EPIDEMIOLOGY AND PUBLIC HEALTH STUDY PROGRAM Epidemiology And Public Health (EPH-301B. RESEARCH IN EPI AND PUBLIC HEALTH) Program Director: Kathryn M. Andolsek, M.D., M.P.H. The Epidemiology and Public Health Study Program is designed for students pursuing third year opportunities in public health, usually a masters of public health degree or a CDC experience. It supplements formal course work to allow students the opportunity to participate in the research design and/or analysis of a research study, .Participants will practice skills related to research design, statistical analyses, assessment health

policy, and comparative health systems so that they can be effective contributors to the improvement of the system of health care. The focus may be on improved health of the patient or a discrete population but should be transferable to local, state, national and/or global health issues. Each student selects a Duke faculty mentor in consultation with the study track director. Required Research. . Each student will have the equivalent of 10-12 months participation in research. Students should identify a mentor, and research topic by Spring/Summer of the year in which they begin their third year. Ideally IRB approval is obtained at the same time recognizing that IRB approval is usually necessary through both Duke and other pertinent institutions. Coursework continuously informs their research project. Each student will to produce an in-depth thesis analyzing an area of epidemiology, health service research, finance, health systems, or health policy. This research activity extends throughout the year, culminating with the acceptance of the completed thesis. This study track is for students participating in an MPH or CDC experience. For MPH students, the student must apply to the MPH school and to the Medical School by completing the Duke Third Year Elective Form. There are several "pre-approved" MPH programs at the School of Public Health (at the University of North Carolina at Chapel Hill). These include Epidemiology; Health Care and Prevention; Maternal and Child Health and Nutrition. Students interested in another study track must petition the Duke third year committee for "acceptance". Students usually complete all requirements for the M.P.H. degree during one academic year in fulfillment of their third year requirement. Dr. Andolsek is the director of the M.D./M.P.H. Program. Dr. David Matchar, director of the M.D./M.P.P study track, works with students interested in one of the other dual degrees: Duke master's degree in Public Policy from the Sanford Public Policy Institute (M.D./M.P.P. program), the Duke master's in Business Administration from the Fuqua School (M.D./M.B.A. program) and the J.,D., degree from Duke Law School. These programs typically take 2-3 years to complete necessitating an extension of the time required for completing the third year requirement. Students may also work with in the field of public health (but without pursuing a second degree) through the Clinical Research Study Track, headed by Dr. Galen Wagner or in an area of qualitative research through the Humanities study Tract headed by Margaret Humphreys, M.D., Ph.D. In addition, students may propose an individually-tailored Study Away option. Study away proposals are reviewed and approved individually by the Third Year Committee. Placements in the Cloister Program at the National Institutes of Health and at the National Institute of Environmental Health Sciences in Research Triangle Park are options; the supervision of students in the study away programs can be carried out by faculty from a number of study programs. FACULTY: David Albala, M.D.; Kathryn M. Andolsek, M.D., M.P.H.; Jay Baker, M.D.; John Bartlett, M.D., Lori A. Bastian, M.D.; Dan G. Blazer, M.D., Ph.D.; Terrill Bravender, M.D.; Haywood Brown, M.D.; Barbara J. Burns, Ph.D.; Marian Butterfield, M.D., Robert M. Califf, M.D.; Dennis A. Clements, M.D., Ph.D.; Harvey Cohen, M.D.; John M. Dement, Ph.D.; Rowena Dolor, M.D.; David Edelman, M.D.; Christopher Edwards, Ph.D.; Mark Feinglos, M.D.; Michael Freemark, M.D.; William Fulkerson, M.D.; Linda K. George, Ph.D.; Deborah T. Gold, Ph.D.; Christopher Granger, M.D.; Carol Dukes Hamilton, M.D.; Judith C. Hays, Ph.D.; Catherine Hoyo, M.D., Ph.D.; Margaret Humphreys, M.D., Ph.D.; Keith Kaye, M.D.; Linda Kinsinger, M.D.; Harold Koenig, M.D.; Paul Lee, M.D., J.D.; Hester Lipscomb, Ph.D.; Elizabeth Livingston, M.D.; Joseph Lo, Ph.D.; David Lobach, M.D., Ph.D.; David B. Matchar, M.D.; Lloyd Mitchener, M.D.; John Murray, M.D.; Evan R. Myers, M.D., M.P.H.; Kristen Newby, M.D.; Chris Newgard, M.D.; Steven Olson, M.D.; Truls Ostbye, M.D.; George Parkerson, M.D., Ph.D.; Eric Peterson, M.D.; Ricardo Pietrobon, M.D.; John Sampson, M.D., Ph.D.; Joellen M. Schildkraut, Ph.D.; Kenneth Schmader, M.D.; Kevin A. Schulman, M.D., M.B.A.; Bill Scott, M.D.; Pearl Seo, M.D.; David L. Simel, M.D., M.H.S.; Cellette Skinner, Ph.D.; Frank Sloan, Ph.D.; Laura Svetkey, M.D.; Nathan Thielman, M.D.; James A. Tulsky, M.D.; Eric Westman, M.D., M.H.S.; David Witsell, M.D., M.H.S.; Christopher Woods, M.D.

# Human Genetics Study Program

**HGP-301B. RESEARCH IN HGP.** HGP-301B. RESEARCH IN HGP. Program Director: Michael A. Hauser, Ph.D. Our genetic makeup to a large extent dictates our health. The promise of the Human Genome Initiative is a greater understanding of the genetic components to health. Once the genetic contributions to common diseases like osteoarthritis, heart disease, and cancer are understood, the

physician will have a powerful means at his or her disposal for identifying individual risk factors and offering lifestyle modifications. The study program in human genetics offers third year medical students an integrated program for understanding research in human genetics, its application to human genetic disease for risk assessment, genetic counseling, public health practice, and potential therapeutics, and ethical and legal implications for this research on the patient, the family, and society. We anticipate that students in this program will follow one of several broad paths, utilizing either a molecular approach or a statistical and epidemiologic approach to understanding and treating human genetic disease. Research opportunities are available in laboratories studying such diverse topics as positional cloning of human disease genes, apoptosis gene therapy, biochemical genetics, animal models of genetics and development, and genetic epidemiology. Opportunities for both basic science and clinical/epidemiologic research projects are available in various laboratories participating in the HGP. In addition to the research project and thesis, the program requirements include a year-long seminar series targeting current topics in human genetic research. Other elective courses may be taken with the permission of the program director and the student's preceptor. FACULTY: Rose-Mary Boustany, M.D.; Blanche Capel, Ph.D.; Yuan-Tsong Chen, M.D., Ph.D.; Robert Cook-Deegan, M.D.; Philip G. Febbo, M.D.; John R. Gilbert, Ph.D.; Pascal J. Goldschmidt, M.D.; David B. Goldstein, Ph.D.; Elizabeth R. Hauser, Ph.D.; Michael A. Hauser, Ph.D.; John Klingensmith, Ph.D.; Virginia B. Kraus, M.D., Ph.D.; Douglas Marchuk, Ph.D.; Eden R. Martin, Ph.D.; Joseph R. Nevins, Ph.D.; Margaret Pericak-Vance, Ph.D; Joellen Schildkraut, Ph.D.; William K. Scott, Ph.D.; Marcy C. Speer, Ph.D.; Bruce Sullenger, Ph.D.; Jeffrey M. Vance, M.D., Ph.D.; Huntington F. Willard, Ph.D.; Michelle P. Winn, M.D.; Fulton Wong, Ph.D.

# Immunology Study Program

**ISP-301B. RESEARCH IN ISP.** IMMUNOLOGY STUDY PROGRAM Program Director: Jeffrey R. Dawson, Ph.D. A fundamental understanding of the immune system is central to the effective management of disease in a vast array of public health and clinical settings. The Immunology Study Program will appeal to students interested in the public health initiatives of vaccine design and the management of infectious diseases. This research experience can also be focused on one of a wide variety of pervasive clinical problems. Aberrations of immune system development can be studied in fundamental ways using animal models and within the context of the primary immunodeficiencies they cause. Diseases of chronic inflammation and autoimmunity highlight the damaging effects of exaggerated or inappropriate immune responses and can be examined through research focused on the pathogenesis of diseases such as asthma and rheumatoid arthritis. Modulation of normal immune responses is also critical to the management of solid organ and bone marrow transplantation and is becoming increasingly important in the treatment of tumor. All of these issues can be explored in fundamental ways using well-defined animal models and within the context of the associated human diseases. The student may also choose to undertake research pertinent to the myriad molecular processes that underlie normal lymphocyte development and function and use this opportunity to master some of the new technologies available to biomedical research. The ISP emphasizes original research. This program offers third year medical students an opportunity to undertake basic research in immunology and to integrate with graduate students, fellows, and faculty of the Department of Immunology. Preceptors can be chosen from across this broad discipline with projects in all of the above sub-specialties available at Duke. Preceptors will be asked to provide a short list of projects that can be undertaken in their laboratory within the constraints of this program (available on request from the Program Director). The primary goal of the program is to encourage and develop the student's own creativity in the sciences and to provide a substantial research base that will serve the student well in their clinical years. An optional in-depth course in the basic concepts of cellular and molecular Immunology is offered in the spring semester (3 hours per week). Further, there are a variety of seminars and journal clubs that bring the Immunology Department together for presentations of current work and help us all to keep up-to-date with this ever expanding discipline. FACULTY: R. Randal Bollinger, M.D., Ph.D.; Rebecca H. Buckley, M.D.; Jeffrey R. Dawson, Ph.D.; Jos Domen, Ph.D.; Kimberly Lynn Gandy, M.D., Ph.D.; Eli Gilboa, Ph.D.; Russell P. Hall, III, M.D.; Barton F. Haynes, M.D.; Maureane Hoffman, M.D., Ph.D.; Michael S. Krangel, Ph.D.; Garnett H. Kelsoe, D.Sc.; Joanne Kurtzberg, M.D.; M. Louise Markert,

M.D., Ph.D.; David C. Montefiori, Ph.D.; William Parker, Ph.D.; Dhavalkumar D. Patel, M.D., Ph.D.; David S. Pisetsky, M.D., Ph.D.; Scott Pruitt, M.D., Ph.D.; Hilliard F. Seigler, M.D.; Herman F. Staats, Ph.D.; Thomas F. Tedder, Ph.D.; Marilyn J. Telen, M.D; Kent J. Weinhold, Ph.D.; Yuan Zhuang, Ph.D.

# Medical Humanities Study Program

**MEDHUM-301B. RESEARCH IN MEDHUM.** MEDICAL HUMANITIES STUDY PROGRAM. Program Director: Margaret Humphreys, M.D., Ph.D. Overview: The Medical Humanities Study Program offers a multidisciplinary opportunity for students to explore topics in medical history, ethics, theology, and other fields within the medical humanities. Students design their own research projects under the guidance of medical humanities mentors, and tailor their third year experience around the completion of this project. While some students may participate in their mentor's ongoing research, others can pursue projects independent of (but related to) their mentor's primary areas of interest. Curriculum: Research. The principal component of the Medical Humanities Study Program is an in-depth research experience within the medical humanities. The location of this research will vary with the mentor and project chosen. Some projects may be appropriately pursued in libraries and archives. Others may include interviews with or experimentation upon human subjects in the clinical or other academic setting. Like their peers in the more traditional science track, medical humanities students will explore a research question, find data to support or refute it, and write a thesis that communicates their results. Proposal. All students are expected to prepare a 3-5 page proposal by the end of spring of the second year outlining the aims of the proposed research in consultation with their chosen mentor. This proposal will state the problem to be studied, the rationale and relevance of the problem, and include a bibliography of relevant literature and sources. Courses. Students are expected to take up to five courses in the medical humanities during their third year. Working with their mentor, students will identify courses within the university relevant to their research question. Courses may be chosen from the Medical School, Divinity School, or Faculty of Arts and Sciences. Individual readings courses with the mentor or other faculty may be included in the courses chosen. Lecture series. Students will attend the regular humanities lecture series offered through the Center for the Study of Medical Ethics and Humanities. Posters. Students are expected to submit abstracts to present results in poster or oral format at the annual Alpha Omega Alpha research day in the Searle Center that usually occurs in early June. Final Thesis. Students will prepare a thesis that represents the product of their research, usually 15-20 pages in length. This is due on the thesis deadline date set by the Registrar's Office. Presentations: Students are expected to present a paper based on their research to the humanities lecture series during the spring semester. Publication: Students are encouraged to produce work that is of sufficient originality, importance, and quality that it will be accepted for publication by a relevant medical humanities journal. Authors of historical theses will be encouraged to submit their work for the William Osler Prize awarded by the American Association of the History of Medicine for the best essay by a medical student. The winning essay of this prize contest is traditionally published in the Bulletin of the History of Medicine. FACULTY: Jeffrey P. Baker, M.D., Ph.D.; Peter C. English, M.D., Ph.D.; Angela Holder, J.D., L.L.M; Margaret Humphreys, M.D., Ph.D.; Keith Meador, M.D., Th.M., M.P.H.; James A. Tulsky, M.D.

# Microbiology and Infectious Diseases Study Program

**MIDP-301B. RESEARCH IN IDP.** IDP-301B. RESEARCH IN IDP. Program Director: Thomas G. Mitchell, Ph.D. Knowledge of infectious diseases is relevant to the care of patients of all ages and each clinical specialty. The Infectious Diseases Study Program provides students with the opportunity to explore infectious diseases in a laboratory or clinical setting coupled with seminars and optional courses. The IDP offers an in-depth research experience in several areas of infectious diseases and microbiology, such as microbial pathogeneisis, host defenses, chemotherapy, epidemiology, and clinical aspects. The goals of the IDP are to instill a critical assessment of information, provide direct experience with research and the opportunity for the creative acquisition of data, encourage independent thinking, and promote insight into biomedical technology and the interrelationship of clinical infectious diseases with basic microbiology and immunity. The participating faculty members are involved in a range of clinical, translational and basic research, including molecular mechanisms of

bacterial, fungal or viral pathogenesis, the evolution of microbial pathogens, anti-microbial chemotherapy, the molecular epidemiology of infectious diseases, clinical studies in infectious diseases, and the use of model microorganisms to investigate fundamental processes in genetics and cellular and molecular biology. Each student will select a faculty mentor, and together, they will develop an original proposal within the context of the mentor's ongoing research program. The student will be expected to design experiments, critically assess the relevant literature, evaluate data, apply appropriate statistical tests, solve problems associated with the project, and communicate the research results in written and oral presentations. Appropriate guidance and assistance are provided by the faculty and others within the laboratory or clinical setting. The major emphasis of the program is the research project, and students function as graduate students. The commitment is a full-time effort, entailing at least 40 hours per week with negotiated time off. Courses. During the spring term, students may take either Medical Immunology (MGM 330B), Virology and Viral Oncology (MGM 252B), or Microbial Pathogenesis (MGM 282B), depending on the nature of the student's research. Seminars. Students in the IDP attend seminars in which faculty members, fellows, and students present their ongoing research. Such presentations enable the student to observe and participate in the critical analysis of research before it reaches the publication stage. Additional Course Work. Although other basic science electives may be taken upon approval by the mentor and the program director, the student is discouraged from excessively diluting the laboratory experience. FACULTY: Alejandro Aballay, Ph.D.; Kenneth Alexander, M.D., Ph.D.; J. Andrew Alspaugh, M.D.; John A. Bartlett, M.D.; Rebecca H. Buckley, M.D.; Gary M. Cox, M.D.; Coleen K. Cunningham, M.D.; Richard Frothingham, M.D.; Mariano A. Garcia-Blanco, M.D., Ph.D.; Carol Dukes Hamilton, M.D.; John D. Hamilton, M.D.; Joseph Heitman, M.D.; Keith S. Kaye, M.D.; Jack D. Keene, Ph.D.; Kenneth N. Kreuzer, Ph.D.; John H. McCusker, Ph.D.; Thomas G. Mitchell, Ph.D.; David C. Montefiori, Ph.D.; Joseph R. Nevins, Ph.D.; John R. Perfect, M.D.; David J. Pickup, Ph.D.; Christian R.H. Raetz, M.D., Ph.D.; Daniel J. Sexton, M.D.; Herman F. Staats, Ph.D.; Raphael Valdivia, Ph.D.; J. Brice Weinberg, M.D.; Kenneth H. Wilson, M.D.; Christopher Woods, M.D.

# Neurosciences Study Program

**NSS-301B. RESEARCH IN NSS.** NEUROSCIENCES STUDY PROGRAM. Program Director: Daniel Laskowitz, M.D. Overview: The Neurosciences Study Program provides a multidisciplinary opportunity for third year medical students over the broad range of basic and clinical neurosciences. Many of the most intractable and prevalent diseases of our time afflict the nervous system, and in many ways research in the neurosciences represents one of the final frontiers of medicine and biomedical science. Areas of study include molecular and cellular neuroscience, neuroimaging, developmental neurobiology, systems and cognitive neuroscience, animal modeling of neurological disease, and translational neuroscience. Faculty in the program are drawn from many departments including Neurobiology, Radiology, Pharmacology, Cell Biology, Psychology, Neurosurgery, Neurology, Pediatrics, Medicine, Psychiatry, and Ophthalmology, and are engaged in research that ranges from fundamental properties of ion channels and neurotransmitter receptors to cognition and perception. The program emphasizes a basic research experience under the guidance of a mentor along with opportunities to attend seminars and present results in written, oral, and poster presentations. Research. The basic component of the Neurosciences Study Program is an in-depth research experience in a research laboratory under the supervision of one of the participating faculty. Students will work full-time in a laboratory pursuing an independent research project including conducting experiments, analyzing results, and communicating findings. Proposal. All students are expected to prepare a 2-3 page proposal by the beginning of the third year, outlining the aims of the proposed research in consultation with their chosen mentor. This proposal should state the problem to be studied, the rationale and relevance of the problem, the specific hypotheses to be tested, a brief description of the experiments to be performed, and references. Courses. Students will have the opportunity to take or audit graduate level courses offered in the Departments of Neurobiology, Cell Biology, and Pharmacology, as well as courses in biostatistics and human disease pathophysiology and therapeutics. In addition, Vascular, Neurology, Neurosurgery, and Stroke Center conferences can also be attended. Importantly, there are no specific course requirements in the Program, but rather students may pursue their own particular interests by

taking or auditing courses recommended by their mentor or relevant to their research project. Seminars. Students will be able to attend regular seminar series including the Neurobiology Seminar, Signal Transduction Colloquium, Cell Biology Seminar, and Brain Imaging Seminar as appropriate for their particular research project. Meetings. Students will attend monthly informal meetings with Dr. Laskowitz to present proposed research plans, discuss ongoing projects, and to assess progress. These meetings may include presentations by invited speakers to discuss particular topics of interest. Posters. Students are expected to submit abstracts to present results in poster or oral format at the annual Alpha Omega Alpha research day in the Searle Center that will occur in early June. Final Thesis. At the end of the spring semester (sometime toward the end of April), students are required to write up a description of their hypotheses, the outcome of their experiments, and conclusions of their work (15-20 pages). FACULTY: George J. Augustine, Ph.D.; Rose-Mary Boustany, M.D.; James Burke, M.D.; Nell B. Cant, Ph.D.; Carol Coulton, Ph.D.; Michael Ehlers, M.D., Ph.D.; Guoping Feng, Ph.D.; David Fitzpatrick, Ph.D.; Larry Goldstein, M.D.; William C. Hall, Ph.D.; Scott Huettel, Ph.D.; Erich Jarvis, Ph.D.; Lawrence C. Katz, Ph.D.; Cynthia M. Kuhn, Ph.D.; Daniel Laskowitz, M.D.; Darrell V. Lewis, Jr., M.D.; Donald C. Lo, Ph.D.; Roger Madison, Ph.D.; James O. McNamara, Sr., M.D.; J. Victor Nadler, Ph.D.; Michael L. Platt, Ph.D.; James M. Provenzale, M.D.; Dale Purves, M.D.; Peter H. Reinhart, Ph.D.; Saul M. Schanberg, M.D.; Ph.D.; Donald E. Schmechel, M.D.; Rochelle D. Schwartz-Bloom, Ph.D.; Sidney A. Simon, Ph.D.; J. H. Pate Skene, Ph.D.; Theodore A. Slotkin, Ph.D.; John E.R. Staddon, Ph.D.; Warren J. Strittmatter, M.D.; Dennis A. Turner, M.A., M.D.; Jeffrey M. Vance, M.D., Ph.D.; Michael Vitek, Ph.D.; Fulton Wong, Ph.D.

# Ophthalmology and Visual Sciences Study Program

**OVS-301B. RESEARCH IN OVS.** OPHTHALMOLOGY AND VISUAL SCIENCES STUDY PROGRAM. Program Directors: Catherine Bowes Rickman, Ph.D. (Coordinating Director) and David L. Epstein, M.D. Description. The purpose of this study program is to provide third year medical students with research skills and experience that can be applied to future careers as clinician scientists in Ophthalmology and other fields. Although there is a primary emphasis on laboratory science, clinical research programs of inquiry based on strong scholarship are also possible. There is a focus on clinical investigators forming a true partnership with basic science researchers in attempting to advance the understanding and therapy of ocular diseases. There is an emphasis on hypothesis formation and the planning and execution of experiments that can address and then redefine the hypothesis. Curriculum. Each student chooses a preceptor according to her/his interests. Together they determine a topic of investigation which requires hands-on laboratory or clinical research by the student. Joint preceptors (for example, a clinical investigator and a basic science researcher) are acceptable and, in fact, encouraged. The course of study must be approved by the study program directors. At the end of the year, each student is expected to produce an in-depth paper based on the research. Throughout the year, students attend: a) regular lectures on topics about ophthalmology and visual science given by Duke faculty, as well as outside lecturers; b) participate in bi-monthly research workshops in which students and faculty make presentations of hypotheses, assumptions therein, methods, and results, and c) give formal presentations of research work at the conclusion of the year. Research Opportunities. Opportunities include research in physiology, pathology, and molecular and cell biology of the eye as they relate to eye diseases. Opportunities also exist in biophysics and instrumentation, laser cell biology, and scientific basis of glaucoma, corneal, and retinal diseases. FACULTY: Catherine Bowes Rickman, Ph.D.; Edward G. Buckley, M.D.; Pratap Challa, M.D.; David L. Epstein, M.D.; Glenn J. Jaffe, M.D.; Gordon Klintworth, M.D., Ph.D.; Paul Lee, M.D., J.D.; Brooks W. McCuen II, M.D.; Alan D. Proia, M.D., Ph.D.; P. Vasantha Rao, Ph.D.; Dennis W. Rickman, Ph.D.; Cynthia A. Toth, M.D.; and Fulton Wong, Ph.D.

# Pathology Study Program

**PSP-301B. RESEARCH IN PSP.** PATHOLOGY STUDY PROGRAM (PSP). Program Director: Patrick J. Buckley, M.D., Ph.D. Pathology is the study of the essential nature of diseases and especially of the structural and functional changes produced by them. The goal of the Pathology Study Program is to provide the medical student with a thorough learning experience in pathology and labo-

ratory medicine under the guidance of a senior faculty preceptor. The essential element of this program is an independent, but guided research experience. FACULTY: Soman N. Abraham, Ph.D.; Darell D. Bigner, M.D., Ph.D.; Patrick J. Buckley, M.D., Ph.D; Sheila Collins, Ph.D.; Mark W. Dewhirst, D.V.M., Ph.D.; Mark N. Feinglos, M.D.; Charles S. Greenberg, M.D.; Mark W. Grinstaff, Ph.D.; Laura P. Hale, M.D.; David H. Harpole, M.D.; Lizzie J. Harrell, Ph.D.; Maureane Hoffman, M.D., Ph.D.; Randy L.Jirtle, Ph.D.; Daniel J. Kenan, M.D., Ph.D.; Gordon Klintworth, M.D., Ph.D.; Virginia B. Kraus, M.D., Ph.D.; James E. Lowe, M.D.; Herbert K. Lyerly, M.D.; John F. Madden, M.D., Ph.D.; Sara E. Miller, Ph.D.; Salvatore V. Pizzo, M.D., Ph.D.; L. Darryl Quarles, M.D.;Nancy L. Reinsmoen, Ph.D.; L. Barth Reller, M.D.;Victor L. Roggli, M.D.; John D. Shelburne, M.D., Ph.D; Charles Steenbergen, M.D.,Ph.D.;John G. Toffaletti, Ph.D.; Robin T. Vollmer, M.D.

# Pharmacology & Molecular Therapeutics Study Program

**PMT-301B. Pharmacology and Molecular Therapeutics.** PMT-301B. Pharmacology and Molecular Therapeutics. Program Director: Gerard Blobe, M.D., Ph.D. The PMT program is based on utilization of the basic concepts of biology and chemistry for determining mechanisms of human disease, targeting signal transduction pathways for the treatment of human disease and determining how drugs affect humans. It encompasses the study of the biological targets of drug action, the mechanism by which drugs act, the therapeutic and toxic effects of drugs, as well as the development of new therapeutic agents. Participating faculty members have particular strengths in the areas of receptor function and cellular signaling mechanisms as targets of drug action. Special emphasis is placed on the complex regulatory mechanisms that govern mammalian cell growth and differentiation, how these mechanisms are perturbed in human diseases (such as cancer) and how our knowledge of these regulatory mechanisms might lead to improved therapies. Current research interests of the faculty include: 1. cellular signaling mechanisms, including the actions of calcium and cyclic nucleotides on protein phosphorylation/dephosphorylation; 2. receptor function and cell signaling mechanisms regulating cell growth, proliferation and death; 3. the mechanism of action of neuropeptides and neurotransmitters; 4. ontogeny of signaling pathways in nervous, cardiovascular and immune tissue; and 5. the molecular basis of rational drug design. The major emphasis of the PMT program is on student-generated independent study/research projects conducted in close association with a faculty preceptor. In addition, a weekly seminar series, the Signal Transduction Colloquium, exposes participating students to a variety of topics presented by experts in the various relevant fields of research. FACULTY: Nels C. Anderson, Jr., Ph.D.; Richard Lambert Auten Jr., M.D.; Gerard C. Blobe, M.D., Ph.D.; Marc G. Caron, Ph.D.; Patrick J. Casey, Ph.D.; Jonathan A. Cohn, M.D.; Christopher M. Counter, Ph.D.; Michael Freemark, M.D.; Larry Goldstein, M.D.; Joseph Heitman, M.D., Ph.D.; Homme W. Hellinga, Ph.D.; Daniel P. Kiehart, Ph.D.; Sally A. Kornbluth, Ph.D.; Madan Kwatra, Ph.D.; Daniel Lew, Ph.D.; Rodger A. Liddle, M.D.; Haifan Lin, Ph.D.; Donald P. McDonnell, Ph.D.; Anthony R. Means, Ph.D.; Elliott Mills, Ph.D.; Paul Modrich, Ph.D.; Larry Gene Moss, M.D.; Thomas M. Murphy, M.D.; Christopher Nicchitta, Ph.D.; Christopher O'Connor, M.D.; Thomas L. Ortel, M.D., Ann Marie Pendergast, Ph.D.; Johannes Rudolph, Ph.D.; Patricia M. Saling, Ph.D.; David W. Schomberg, Ph.D.; Steven R. Vigna, Ph.D.; Judith A. Voynow, M.D.; Xiao-Fan Wang, Ph.D. ; Thomas Weber, M.D.; Jo Rae Wright, Ph.D.; Tso-Pang Yao, Ph.D.; Heather N. Yeowell, Ph.D.; John D. York, Ph.D.

# Class of 2006 with Postgraduate Year One Appointment

KEY: *Name (Hometown), Undergraduate Institution, Internship Institution – Specialty, Location, Residency Institution – Specialty, Location, Ultimate Career Goals*

Agarwal, Sheela(Orlando, Florida) Duke University; University of North Carolina – Medicine – Preliminary, Chapel Hill, NC, Massachusetts General Hospital – Radiology Boston, MA

Agbahiwe, Harold Chinedu (Arlington, Texas) Princeton University; Thomas Jefferson University – Internal Medicine, Philadelphia, PA

Ajijola, Olujimi Adeoluwa (Lagos, Nigeria) University of Virginia; Massachusetts General Hospital – Internal Medicine, Boston, MA

Arnold, Staci Denise (Kansas City, Missouri) Spelman College; Duke University Medical Center – Pediatrics, Durham, NC

Batra, Priya (Rockaway, New Jersey)Rensselaer Polytechnic Institute; Mt. Sinai Hospital – Medicine – Preliminary, New York, NY, New York University – Dermatology, New York, NY

Bennett, Kyla Megan (Durham, North Carolina) Johns Hopkins University; Duke University Medical Center – Surgery, Durham, NC

Bigger, Elizabeth Sun Mee (Holmdel, New Jersey) Yale University; Vanderbilt University – Internal Medicine, Nashville, TN

Blacksburg, Seth Robert (Woodmere, New York) Tufts University; New York University - Medicine – Preliminary, New York, NY, Mt. Sinai Hospital – Radiation Oncology, New York, NY

Boyce, Ebony Ann (Columbus, Ohio) Stanford University; Brigham & Women's/Massachusetts General Hospital – Obstetrics & Gynecology, Boston, MA

Butcher, Brad Wesley (Newport News, Virginia) Harvard University; Massachusetts General Hospital – Internal Medicine, Boston, MA

Cairo, Dana Lynn (Durham, North Carolina) University of Miami; Cleveland Clinic –Pathology, Cleveland, OH

Cantor, David Asher (Newton, Massachusetts) Massachusetts Institute of Technology: Virginia Mason – Transitional Year, Seattle, WA; Virginia Mason – Anesthesiology, Seattle, WA

Cernanec, Julie Marie (Strongsville, Ohio) Duke University; Duke University Medical Center – Pediatrics, Durham, NC

Chik, Yolanda T. (Rockville, Maryland) Duke University; Duke University Medical

Center – Medicine – Preliminary, Durham, NC; Johns Hopkins University – Neurology

Baltimore, MD

Choi, Emily (Mt. Pleasant, South Carolina) Brown University; Christiana Care – Medicine –Preliminary, Newark, DE; Massachusetts General Hospital/

Brigham & Women's Hospital– Neurology, Boston, MA

Choma, Michael Andrew (Marlboro, New Jersey) Case Western Reserve University; Children's Hospital – Pediatrics, Boston, MA

Chong, Gabriel Tsing-Tzong (Worthington, Ohio) Ohio State University; Christiana Care – Medicine – Preliminary, Wilmington, DE; Duke University – Ophthalmology,

Durham, NC

Chow, Jessica(Davis, California) Stanford University; Kaiser Permanente – Santa Clara – Medicine – Preliminary, Santa Clara, CA; Duke University – Ophthalmology, Durham, NC

Chung, Melissa Grace(Rockville, Maryland) Yale University; Northwestern University –McGaw/Childrens' Memorial Hospital – Pediatrics, Northwestern University –

McGaw/Childrens' Memorial Hospital – Pediatric Neurology, Chicago, IL

DeCroos, Francis Charindra (Fort Walton Beach, Florida) Massachusetts Institute of Technology; Christiana Care – Medicine – Preliminary, Wilmington, DE; Duke University Medical Center – Ophthalmology, Durham, NC

DeSimone, Noelle Annette (McRoberts, Kentucky) University of Georgia; Duke University Medical Center – Anesthesiology, Durham, NC

Dominguez, David Emilio(Melbourne, Florida) University of Florida; Texas A & M University – Orthopaedic Surgery, Temple, TX

Donnelly, Meghan Ann (Denver, Colorado) University of Virginia; Duke University Medical Center – Obstetrics and Gynecology, Durham, NC

Dzirasa, Erikka Daniene (Buffalo, New York) Spelman College; Duke University Medical Center – Psychiatry, Durham, NC

Eads, Emily Dawn (Lexington, Kentucky) Princeton University; Scripps Mercy Hospital – Transitional, San Diego, CA; Duke University Medical Center – Radiology, Durham, NC

Edwards, Claire (Annandale, Virginia) University of Virginia; George Washington University – Surgery, Washington, DC

Elangovan, Ganesh Kumar (Milwaukee, Wisconsin) University of Wisconsin-Madison;

University of California, Los Angeles – Neurological Surgery, Los Angeles, CA

Elliott, Rebecca Lynn (Wheeling, West Virginia) Princeton University; Duke University Medical Center – Internal Medicine, Durham, NC

Evans, David Clay (Fort Wright, Kentucky) Duke University; Ohio State University – Surgery, Columbus, OH

Evans, Sarah Elizabeth (Longmont, Colorado) Grinnell College; Duke University Medical Center – Surgery, Durham, NC

Fatheddin, Parvin (Nashville, Tennessee) Vanderbilt University; Washington University – Internal Medicine, St. Louis, MO

Finn, Alexander J. (Chapel Hill, North Carolina) Brown University; University of North Carolina – Pathology, Chapel Hill, NC

Gaillard, Stphanie (New York, New York) University of Virginia; Johns Hopkins Hospital – Internal Medicine, Baltimore, MD

Gandhavadi, Maheer Balaraju (Brookfield, Wisconsin) Duke University; University of California – San Francisco – Internal Medicine, San Francisco, CA

Ganesh, Shanti Portia (Gainesville, Florida) Agnes Scott College; Rehabilitation Institute of Chicago/Northwestern, Chicago, IL;

Gbadebo, Adepeju Lyzalice (Windsor, Connecticut) Princeton University; Yale-New Haven Medical Center – Internal Medicine, New Haven, CT

Goswami, Robi (Englewood, Colorado) Stanford University; Duke University Medical Center – Internal Medicine, Durham, NC

Griffin, Jeffrey Michael (Woodbridge, Virginia) University of North Carolina; Northwestern University – Internal Medicine, Chicago, IL

Grisham, Rachel Nicole (Princeton, New Jersey) Rutgers University; Massachusetts General Hospital – Internal Medicine, Boston, MA

Guevara, Carlos Javier (Puebla, Mexico) University of South Carolina; Harvard University – Orthopaedics, Boston, MA

Hamoui, Nabeel (Spring Hills, Florida) University of Miami; Northwestern University Feinberg School – Urology, Chicago, IL

Hanson, Neil Ali (Falls Church, Virginia) University of Virginia; Duke University Medical Center – Anesthesiology, Durham, NC

Hembree, Walter Chad (Newman, Georgia)Wake Forest University; Duke University Medical Center – Orthopaedic Surgery, Durham, NC

Henson, Michele Renee (Neenah, Wisconsin) University of Georgia; Vanderbilt University – Medicine/Pediatrics, Nashville, TN

Horton, April Carol (Murfreesboro, Tennessee) Furman University; University of Maryland – Medicine – Preliminary, Baltimore, MD; University of Pennsylvania – Anesthesiology, Philadelphia, PA

Horvath, Brian David(Pittsburgh, Pennsylvania) Duke University; University of Pittsburgh – Medicine – Preliminary, Pittsburgh, PA, Virginia Commonwealth University – Dermatology, Richmond, VA

Hotaling, James Morris (Hinsdale, Illinois) Dartmouth College; University of Washington – Urology, Seattle, WA

Howard, Brandon Augustus (Lovettsville, Virginia) Swarthmore College; Duke University Medical Center – Medicine – Preliminary, Durham, NC; University of Virginia – Radiology, Charlottesville, VA

Humphries III, William Edward (Lithonia, California) Morehouse College; Baylor College of Medicine – Neurological Surgery, Houston, TX

Hutcheson, Kelley Amber (Dallas, Texas) Duke University; Duke University Medical Center – Surgery, Durham, NC

Hwang, Allen Lun (Columbus, Indiana) Indiana University – Bloomington; University of California, San Francisco – Internal Medicine, San Francisco, CA

Jones, Lisa Marsha (Silver Spring, Maryland) Johns Hopkins University; University of Pennsylvania – Internal Medicine, Philadelphia, PA

Jones, Peter John (Bountiful, Utah) Utah State University; Dartmouth – Hitchcock Medical Center – Urology, Lebanon, NH

Jones, Wilbert Livingston (Montgomery, Alabama) Morehouse College; Baylor College of Medicine – Surgery, Houston, TX

Kansagra, Sujay Mansukhlal (Greenville, North Carolina) University of North Carolina – Chapel Hill, University of North Carolina – Chapel Hill – Pediatrics, Chapel Hill, NC

Duke University – Pediatric Neurology, Durham, NC

Karikari, Isaac Obiri (Ghana, West Africa) Morehouse College; Johns Hopkins University – Internal Medicine, Baltimore, MD

Khazanie, Prateeti Prabhaker (Greenville, North Carolina) Duke University; Stanford University – Internal Medicine, Palo Alto, CA

King, Kara Olisa (Columbia, South Carolina) Wake Forest University; Duke University Medical Center – Family Medicine, Durham, NC

Klein, Peter Justin (Columbus, Ohio) Duke University; Harvard Law School (JD)

Healthcare Venture Capital,

Krishnan, Sriyesh (Eden, North Carolina) Johns Hopkins University; Carolinas Medical Center – Medicine Preliminary, Charlotte, NC; University of Pennsylvania – Radiology,

Philadelphia, PA

LeBlanc, Thomas William (East Providence, Rhode Island) Brown University; Duke University Medical Center – Internal Medicine, Durham, NC

Lee, Jeanne (Decatur, Alabama) University of South Alabama; Duke University Medical Center – Surgery, Durham, NC

Lesher, Aaron Payne (Rutherfordton, North Carolina) Davidson College; Medical University of South Carolina – Surgery, Charleston, SC

Liel, Meghan Shaw (Portland, Oregon) Rice University; Oregon Health & Science University – Internal Medicine, Portland, OR

Livingston, Lauren Snyder (Lexington, North Carolina) Davidson College; Mountain AHEC – Family Medicine, Asheville, NC

Makar, Ryan Aziz (Tokyo, Japan) Yale University; Naval Medical Center – Transitional

San Diego, CA, Orthopaedic Surgery

Malhotra, Anuj (Englewood Cliffs, New Jersey) Yale University; St. Mary's Medical Center – Medicine – Preliminary, San Francisco, CA; Massachusetts General Hospital – Anesthesiology, Boston, MA

Mall, Nathan Andrew (St. Louis, Missouri) University of Missouri – Columbia; Washington University – Orthopaedic Surgery, St. Louis, MO

McKee, John Andrew (Chadds Ford, Pennsylvania) Duke University; McKinsey & Company, Health Care Practice, Silicon Valley Office, Palo Alto, CA

McKinney, Matthew Stuart (Murfreesboro, Tennessee) University of Tennessee; Duke University Medical Center – Internal Medicine, Durham, NC

Mignone, John L. (Bronxville, New York) State University of New York – Stony Brook;

University of Washington – Internal Medicine, Seattle, WA

Moeller, Benjamin James (Omaha, Nebraska) Massachusetts Institute of Technology;

University of Texas, Houston – Medicine/Surgery, Houston, TX; MD Anderson Medical Center – Radiation Oncology, Houston, TX

Moeller, Molly Kathleen Boyce (Fort Wayne, Indiana) Kenyon College; Baylor College of Medicine – Pediatrics, Houston, TX

Neely, Mark Howard (Augusta, Georgia) University of Georgia; University of North Carolina – Medicine-Preliminary, University of North Carolina – Radiology, Chapel Hill, NC

Nguyen, Lisa Thao (Yorba Linda, California) University of California – Irvine; Duke University Medical Center – Medicine/Pediatrics, Durham, NC

Nikolic, Ivana(Banja Luka, Republic of Bosnia) University of North Carolina, Greensboro, University of Pennsylvania – Internal Medicine, Philadelphia, PA

Nimjee, Shahid Mehdi (Brampton, Ontario, Canada) Yale University; Duke University - Neurological Surgery, Durham, NC

Orman, Eric Scott (Baltimore, Maryland) University of Virginia; University of Michigan – Internal Medicine, Ann Arbor, MI

Parks, Lauren Denice (Reidsville, North Carolina) Wake Forest University; Moses Cone Hospital – Medicine – Preliminary, Greensboro, NC; Wake Forest University – Radiology, Winston-Salem, NC

Patil, Sarita Ulhas (Pittsburgh, Pennsylvania) Stanford University; University of Pennsylvania – Internal Medicine, Philadelphia, PA

Peddi, Srinivas (St. Louis, Missouri) Johns Hopkins University; Washington University – Radiology, St. Louis, MO

Pizzi, Catherine Cole (Severna Park, Maryland) Princeton University; University of Washington – Pathology, Seattle, WA

Rashid, Omar Maen (Pembroke Pines, Florida) Dartmouth College; Virginia Commonwealth University – Surgery, Richmond, VA

Rosonke, Brooke Renae (New Hampton, Indiana) Yale University; University of Arizona – Emergency Medicine, Tuscon, AZ

Ross, Paden Danielle (Greenwood Village, Colorado) Michigan State University; Duke University Medical Center – Medicine/Pediatrics, Durham, NC

Sandstrom, Claire Kalsch (Leesburg, Virginia) Haverford College; Scripps-Mercy Hospital – Transitional, San Diego, CA; University of Washington – Radiology Seattle, WA

Sanka, Radha Krishna (Pikesville, Maryland) Massachusetts Institute of Technology; Emory University – Ophthalmology, Atlanta, GA

Schroeder, Emily Bartlett (Durham, North Carolina) Yale University; Duke University Medical Center – Internal Medicine, Durham, NC

Shaughnessy, Michael Reilly (Durham, North Carolina) Princeton University; Carolinas Medical Center – Medicine-Preliminary, Charlotte, NC; Massachusetts General Hospital – Anesthesiology, Boston, MA

Shirvani, Shervin Mohajer (Houston, Texas) Rice University; Stanford University – Internal Medicine, Palo Alto, CA

Sitzman, Thomas James (Fredericksburg, Virginia) University of Virginia; University of Wisconsin – Madison – Plastic Surgery, Madison, WI

Smrtka, Michael P. (Rochester Hill, Minnesota) Fordham University; Duke University Medical Center – Obstetrics & Gynecology, Durham, NC

Stebbins, Stanton Andrew (Rock Hill, South Carolina) Duke University; Emory University – Pediatrics, Atlanta, GA

Strand, Jens Christian(North Oaks, Minnesota) Carleton College; University of Iowa, - Anesthesiology, Iowa City, IO

Taylor, Erica Dianne (Reston, Virginia) University of Virginia; University of Virginia – Orthopaedic Surgery, Charlottesville, VA

Teaberry, Vanessa Suzanne (Canfield, Ohio) University of North Carolina, Chapel Hill;

Duke University Medical Center – Surgery, Durham, NC

Tully, Hannah More (Toronto, Canada) Bennington College and State University of New York; University of Washington – Pediatric Neurology, Seattle, WA

Tung. Crystal Ihua (Buffalo, New York) Cornell University; University of Pittsburgh – Neurology, Pittsburgh, PA

Tyler, Sarah Louise (Cleveland, Ohio) Princeton University; Children's Hospital of Pittsburgh – Pediatrics, Pittsburgh, PA

Unger, Joshua Mostkoff (Miami Beach, Florida) Duke University; University of North Carolina – Chapel Hill – Surgery, Chapel Hill, NC

Uschold, Timothy David (Rochester, New York) Cornell University; Barrow Neurological Institute – Neurological Surgery, Phoenix, AZ

Van de Ven, Thomas John (Grand Island, New York) Canisius College; Duke University Medical Center – Anesthesiology, Durham, NC

Waggoner, Jesse J. (Green Bay, Wisconsin) University of Wisconsin – Madison; Duke University Medical Center – Internal Medicine, Durham, NC

Wilson, Kitchener Daniel (Santa Barbara, California) Stanford University; PhD Program in Bioengineering, Stanford University, Stanford, CA, Cardiovascular Bioengineering

Worjoloh, Ayaba Gbeye (Newark, Deleware) Stanford University; University of California, San Francisco – Obstetrics and Gynecology; San Francisco, CA

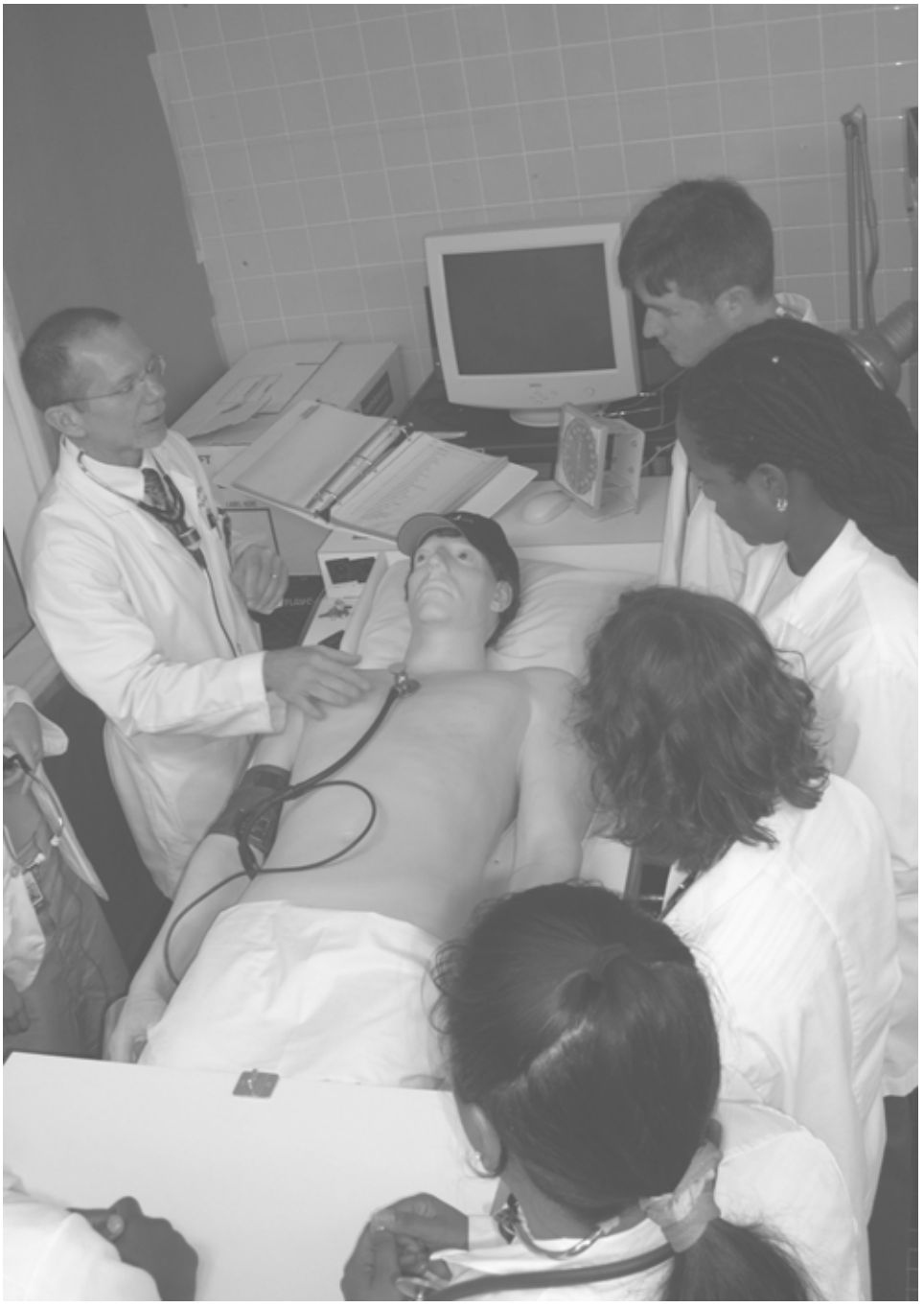
Wu, Arthur William (Rancho Palos Verdes, California) Stanford University; University of California, Los Angeles – Otolaryngology, Los Angeles, CA

Xue, Hui (Tiayuan, China) University of Florida; Duke University Medical Center – Internal Medicine, Durham, NC

Yang, Qinghong (Hangzhou, China) Hangzhau University; Brigham and Women's Hospital – Pathology, Boston, MA

Zucker, Adam Jacob (West Newton, Massachusetts) Oberlin College; Mt. Sinai Hospital – Internal Medicine, New York, NY

# *Doctor of Physical Therapy Division*



# Doctor of Physical Therapy Division

## The Profession of Physical Therapy

Doctors of Physical Therapy (DPT) apply the knowledge of the basic sciences to the prevention and treatment of movement dysfunction resulting from disease or injury. The physical therapist screens, examines, evaluates, diagnoses, prognoses, and provides interventions across the life span. Patient interventions are focused on prevention of dysfunction, relief of pain, improvement of strength, endurance, flexibility, coordination, and joint range of motion in order to maximize functional potential. The variety of settings in which a physical therapist may work includes hospitals, outpatient clinics, schools, skilled nursing facilities, rehabilitation centers, sports facilities, home care agencies, and corporate businesses. With experience, additional education, and board certification, the physical therapist may choose to specialize in orthopaedics, pediatrics, neurology, cardiopulmonary, sports physical therapy, clinical electrophysiology, women's health, and geriatrics. Beyond clinical practice, physical therapists may also pursue roles in education, research, and administration.

## Mission Statement of the Doctor of Physical Therapy Division

The mission of the Doctor of Physical Therapy Division is to prepare Doctors of Physical Therapy, who by virtue of their critical thinking ability, clinical skills, diagnostic competence, ethical standards, and moral character are recognized experts in the diagnosis and management of neuromusculoskeletal function across the continuum of care, and who will serve their patients as primary clinical care practitioners, promoting the optimum health and function of their clients and society.

By pursuing this mission with vision and integrity, these leaders in the profession will seek to engage the mind, elevate the spirit, and stimulate the highest effort of all who are associated with the Doctor of Physical Therapy Division through education, practice, and research.

## Doctor of Physical Therapy Curriculum

The Duke University Medical Center Doctor of Physical Therapy curriculum is a graduate professional degree program for entry into the profession of physical therapy. Upon successful completion of both didactic and clinical components of the curriculum, the student is awarded the Doctor of Physical Therapy (DPT) degree. The three year full-time program, located in the medical center, provides a comprehensive foundation in the art and science of physical therapy, preparing graduates to serve as primary clinical care practitioners for patients with neuromusculoskeletal dysfunction, throughout the continuum of care. The DPT program at Duke University has received full accreditation status from the Commission on Accreditation of Physical Therapy Education of the American Physical Therapy Association, and has offered an accredited educational program for physical therapists since its inception in 1943.

## Faculty

Chief: J. K. Richardson, PT, PhD, OCS

Director of Graduate Studies: Daniel E. Erb, PT, PhD

L. Case, PT, MS, PCS; C. Cook, PT,MBA, PhD, OCS, R. Clendaniel, PT, PhD; D. Dore, EdD, PT, MPA; C. Figuers, PT, EdD; J. Gwyer, PT, PhD; E. Hegedus, PT, DPT, OCS; K. Johnson, MS; C. Odom, PT, DPT, ATC; A. Pastva, PT, PhD; J. Purser, PT, PhD; R. Richardson, PT, MEd; E. Ross, PT, MMS; K. Shipp, PT, PhD; A. Taylor, PhD; L. White, PhD; T. Worrell, PT, EdD, SCS, ATC, FACSM.

**Program of Study.** The curriculum is comprised of 126 credits of academic work, completed over eight academic semesters, requiring 33 months of full-time attendance. Course work includes didactic courses in basic sciences, clinical sciences, patient management, research, administration, education, and two five-month clinical internships. The clinical internships are conducted in selected practice sites in North Carolina and across the country. Two elective courses and a required research

project provide opportunity for the student to pursue areas of physical therapy throughout the entire scope of practice.

**Curriculum.** The curriculum is presented in an integrated format, such that successful completion of all courses in each semester is required prior to progressing on to the next semester.

## Year One

### Fall Semester

| | |
|---|---|
| PT-D-301. Human and Clinical Anatomy | 5 credits |
| PT-D-302. Surface Anatomy - Palpatio | 1 credit |
| PT-D-303. Histology, Embryology and Tissue Biomechanics | 3 credits |
| PT-D-304. Normal Human Development | 2 credits |
| PT-D-305. Physical Therapist Interventions I | 3 credits |
| PT-D-306 Professional Development Seminar | 2 credits |
| PT-D-307. Movement Sciences I/Biomechanics | 3 credits |
| PT-D-308. Clinical Experience I | 1 credit |
| **Total** | **20 credits** |

### Spring Semester

| | |
|---|---|
| PT-D-311. Neurosciences | 4 credits |
| PT-D-312. Pathology | 3 credits |
| PT-D-313. Physical Therapist Interventions II | 4 credits |
| PT-D-314. Integumentary Practice Management | 2 credits |
| PT-D-315. Cardiopulmonary Practice Management | 3 credits |
| PT-D-316. Clinical Examination, Evaluation, Diagnosis and Prognosis | 3 credits |
| PT-D-317. Evidence-based Practice I | 3 credits |
| PT-D-318. Clinical Experience II | 1 credit |
| **Total** | **23 credits** |

### Summer Semester

| | |
|---|---|
| PT-D-321. Movement Science II/Motor Control | 2 credits |
| PT-D-322. Arthrological and Pathological Movement Science I | 3 credits |
| PT-D-323. Diagnostic Imaging | 3 credits |
| PT-D-324. Musculoskeletal Practice Management I | 4 credits |
| PT-D-325. Medical Practice Management | 3 credits |
| PT-D-326. Physical Therapist Interventions III | 3 credits |
| PT-D-327. Patient/Client Management Seminar I | 2 credits |
| PT-D-328. Clinical Internship I | 1 credit |
| Total | 21 credits |

## Year Two

### Fall Semester

| | |
|---|---|
| PT-D-402. Arthrological and Pathological Movement Science II | 3 credits |
| PT-D-403. Musculoskeletal Practice Management II | 4 credits |
| PT-D-404. Neurological Practice Management I | 5 credits |
| PT-D-405. Evidence-based Practice II | 3 credits |
| PT-D-406. Patient/Client Management Seminar II | 2 credits |
| **Total** | **17 credits** |

**Spring Semester (8 weeks)**

| | |
|---|---|
| PT-D-411. Psychosocial Aspects of Care | 2 credits |
| PT-D-412. Neurological Practice Management II | 5 credits |
| PT-D-413. Educational Theory and Practice | 2 credits |
| PT-D-414. Administration I | 3 credits |
| PT-D-415. Patient/Client Management Seminar III | 2 credits |
| **Total** | **14 credits** |

**Spring/Summer Semester (20 weeks)**

| | |
|---|---|
| PT-D-416. Clinical Internship II | 4 credits |

**Year Three**

**Fall Semester (8 weeks)**

| | |
|---|---|
| PT-D-501. Clinical Pharmacology and Nutrition | 2 credits |
| PT-D-502. Administration II | 3 credits |
| PT-D-503. Primary Care Practice | 3 credits |
| PT-D-504. Practice Elective I | 3 credits |
| PT-D-505. Practice Elective II | 3 credits |
| **Total** | **14 credits** |

**Fall/Spring Semester (20 weeks)**

| | |
|---|---|
| PT-D-506. Clinical Internship III | 4 credits |

**Spring Semester (6 weeks)**

| | |
|---|---|
| PT-D-507. Professional Practice Development and Evaluation | 3 credits |
| PT-D-508. Evidence-based Practice III | 3 credits |
| PT-D-509. Health Promotion and Injury Prevention | 3 credits |
| **Total** | **9 credits** |

In addition to the above courses, students must successfully complete written and practical comprehensive examinations as part of PT-D-507, and a research project as part of PT-D-508.

**Program Policies and Grading Standards.** Enrolled students should reference the *2004-2007 DPT Student Handbook* for detailed program policies. Graduate students in the Doctor of Physical Therapy degree program are participants in a professional educational program whose graduates assume positions of responsibility as primary clinical care practitioners in health practice. Accordingly, students are evaluated on their academic and clinical performance and also on their interpersonal communication abilities, their appearance and professional conduct. [Deficiencies in any of these areas are brought to the student's attention in the form of a written evaluation, and failure to correct these performance issues may result in probation, suspension or expulsion from the program.]

**Academic Progression and Requirements for Graduation.** The faculty of the Doctor of Physical Therapy Division accept responsibility for monitoring the academic progress of each student enrolled in the program. The following policy describes the standards by which satisfactory academic progress will be assessed, the determination of academic standing, and the requirements for successful completion of the Doctor of Physical Therapy degree.

## I. Standards of Academic Progress

A. Grades

1. Didactic Courses
   For all didactic courses in the curriculum, the following grading system will be used:
   *A* = 90 – 100 percent
   *B* = 80 – 89 percent
   *C* = 70 – 79 percent

*F* = 69 percent or below
*I* = Incomplete

2. Clinical Courses

For Clinical Education Experiences I and II (PT-D 308 and 318) and for the Clinical Internship I (PT-D 328), the following grading system will be used:

*P* = Pass
*F* = Fail
*I* = Incomplete

For the Clinical Internship II and III (PT-D 416 and PT-D 506), the following grading system will be used:

*A* = 90 – 100 percent
*B* = 80 – 89 percent
*F* = Fail
*I* = Incomplete

Clinical Internship II and III will be graded on the letter grade scale of *A* or *B*. Students must have a grade of *A* or *B* to successfully complete the Clinical Internship. A grade of *F* will result in the requirement to repeat the internship. Students may only repeat an unsuccessful internship one time. If the student is unsuccessful in the repeat attempt, they will receive a failing grade and will be dismissed from the program. The student may appeal their dismissal from the program by notifying the chief in writing, as to why they believe an appeal is warranted. Repeat residencies are scheduled at the discretion of the chief and academic coordinator of clinical education.

3. Incomplete Grades

A grade of *I* Incomplete is given when, at the time the grades are reported, some portion of the student's work in a course is lacking *for an acceptable reason, such as inability to attain sufficient mastery of the course content without additional study due to illness or impairment.* Incomplete grades may be given at the instructor's, chief's, or director of graduate studies' discretion, with the approval of the Committee on Academic Performance for the following reasons:

A. Documented student illness that prevents the student from completing the required work in the semester in which the course is offered.
B. Illness of the student's immediate family member(s), which prevents the student from completing the required work in the semester in which the course is offered.
C. A student who selects alternative or additional unplanned learning experiences that will impede his/her ability to complete course work in the semester in which the course is offered. Examples of such opportunities include: acceptance of a Fulbright Grant, Rhodes scholarship, or other academic award, or participation in the Olympics or Pan American Games.
D. A student who requires maternity or paternity leave or time to provide elder care.

A grade of Incomplete may not be given to a student for the sole purpose of providing additional time so the student may elevate a course grade. Instructors who elect to give a student an *I* grade are committing themselves to perform the additional instruction/evaluation required for the student to complete the course within one calendar year. *I* grades remain on the transcript with the earned grade added later.

The course instructor will determine the manner in which the *I* grade will be converted to an earned grade. The instructor who gives an *I* for a course specifies the date by which the student must have made up the Incomplete, but in no case will this exceed more than one calendar year from the date the course ended or prior to matriculation into a clinical internship. Incomplete grades which are not satisfied within one calendar year automatically become grades of *F*–Fail. If an extension to this time limit is required, an appeal in writing must be made to the chief just prior to expiration of the calendar year in which the Incomplete grade must be completed. When the faculty member certifies that an Incomplete has been satisfied, a passing grade is placed alongside the Incomplete on the permanent and official transcript.

If a student's grade in a course that contains specific subunits is passing, but one or more subunits have been failed, the student will receive a grade of *I* in the course and must complete remedial work in order to earn a passing grade in the course.

4. Failing Grades

A. A grade of *F* Fail is recorded on the permanent record of a student by the Registrar upon submission by the faculty member that unsatisfactory work has been performed by the student. Failures will not be erased from the permanent record, and will result in immediate withdrawal from the Doctor of Physical Therapy Program. However, the student may appeal this withdrawal by indicating in writing to the chief (a) reasons why the student did not achieve minimum academic standards and (b) reasons why the student's immediate withdrawal should be changed. A student may continue to matriculate in courses until the decision of the appeal is determined. The chief will notify the student of the appeal decision in writing within three weeks of receipt of the appeal. All appeals must be mailed to the chief via United States Postal Service Certified Mail.

B. Progression

Normally, all first year courses must be satisfactorily completed before a student may enroll in the second year courses, and all second year courses must be satisfactorily completed before a student may enroll in the third year courses. (When requested by the student, altered sequences for students who require remediation may be considered for approval by the faculty, and the chief.)

## II. Determination of Academic Standing

All students' records are reviewed periodically by the faculty, and each student is assigned to one of the following categories of Academic Standing.

A. Good Academic Standing

The student is considered to be in ***Good Academic Standing*** if they maintain an overall, cumulative, grade point average of 3.0 or higher, and "Pass" for Clinical Experiences or Clinical Internship I for all courses attempted. The student cannot receive less than a grade of *C* in any course attempted.

B. Academic Probation

Academic probation is an academic standing that indicates concern about the student's performance in the curriculum. By placing the student on academic probation, the student is notified of the faculty's concern regarding past performance. The student also is informed that future performance must improve or the student risks withdrawal from the program. In these instances, the director of Graduate Studies will notify the Registrar that the student is being placed on academic probation.

When a student is placed on academic probation, they remain in this academic standing until the student either improves their grade point average to an overall cumulative grade point average of 3.0 or better, or is withdrawn from the program. A student who is currently on Academic Probation must achieve a cumulative grade point average of 3.0 or better in the next consecutive semester or will be withdrawn from the program.

The director of Graduate Studies will notify the student that their performance will be evaluated at the end of each succeeding semester, and that future poor performance may occasion withdrawal from the program (see following section).

The faculty of the Doctor of Physical Therapy Division will use the following standards for assigning the status of academic probation.

1. A student will be considered to be on ***Academic Probation*** if their cumulative grade point average is 2.99 or less.
2. A student who successfully appeals a grade of *F* in one course in the curriculum will be considered to be on ***Academic Probation***. (See Withdrawal below).
   A student who has been placed on Academic Probation may require remedial work to rectify their weakness. Such remediation will be determined by the chief, advised by the faculty, and communicated to the student in writing by the director of Graduate Studies, and may entail additional costs for the student.

C. Withdrawal

A student who fails to demonstrate successful academic progress will be withdrawn from the program.

The faculty of the Doctor of Physical Therapy Division will use the following standards for withdrawing a student from the program.

1. A student will be asked to ***Withdraw*** following the attainment of a grade of *F* Failure in one course in the curriculum. The student may appeal this withdrawal as described under the section, "Failing Grades."
2. A student who is currently on ***Academic Probation*** will be asked to ***Withdraw*** following the attainment of a cumulative grade point average of 2.99 or less in a second consecutive semester.

## III. Appeals of Academic Status (Academic Probation or Withdrawal)

A student placed on Academic Probation or Withdrawn from the program may appeal by indicating in writing to the chief: (a) reasons why the student did not achieve minimum academic standards, and (b) reasons why the student's academic standing should be changed. Each appeal will be considered on its merit. Individual cases will not be considered as precedent. The chief will notify the student of the decision on the appeal in writing within three weeks of receipt of the appeal. All appeals must be mailed to the chief via United States Postal Service Certified Mail.

## IV. Requirements for Graduation

A. Academic Standards for Graduation

The following standards must be met by the student to successfully complete the Doctor of Physical Therapy degree program.

1. Completion with a passing grade of a minimum of 126 units of course credit, including all required courses. This includes the successful completion of a research requirement and of all clinical education courses.
2. Passing of all Practical Examinations administered by the faculty.

B. Time Limits on Meeting Requirements for Graduation

1. The standard required length of study to complete the above-listed academic standards is eight continuous academic semesters of full-time work (including two summer terms), completed in 33 calendar months.

Under extraordinary conditions, a student may be permitted a time limit of two semesters of full or part-time enrollment beyond the standard required length of study to complete the program. The student must apply in writing for such consideration to the chief who will review each case.

2. The student is expected to make continuous and successful progress towards the requirements for graduation throughout the curriculum. The student must register for all required courses during each semester of the curriculum, and may carry into succeeding semesters no more than one *I* course grade. Under extraordinary circumstances, a student may apply for an exception to the typical pattern of progress towards degree requirements.

C. Incomplete Mastery of Content

1. If a student successfully appeals a grade of *F* in a course and is permitted to continue in the curriculum, the instructor is not required to provide individual remediation to the student. In this case, the only plan for remediation is for the student to retake the course in the semester in which it is normally given. The student will bear all financial implications of repeated course work. All remediation efforts must be completed within the above-outlined time limits for completion of the program, or a grade of *F* Fail will remain on the student's permanent record.

**Attendance and Excused Absences.** Students are expected to attend all classes and clinical internship hours, and are excused only for illness or personal emergency. The chief may approve a student's written request for a Leave of Absence for personal, medical, or academic reasons, for a period not to exceed one year. Written notification of the approved time frame of the leave of absence to the

student, the Registrar, and the director of financial aid will be provided. The student must provide written notification of their intent to return to the program at least 90 days prior to the anticipated date of reentry. The student requesting an extension beyond one calendar year may be required to apply for readmission to the program, and/or to repeat some or all course work. For purposes of deferring repayment of student loans during a school-approved leave of absence, federal regulations limit the leave to six months.

**Prerequisites for Admission**. Requirements for admission to the Doctor of Physical Therapy Division include a baccalaureate degree, completion of prerequisite courses, Graduate Record Examination (GRE) Aptitude Test scores from within the last five years, the filing of an application (including essays and reference letters), and upon invitation, a personal interview. The GRE must be taken no later than the November test date.

Prerequisite course work: 3 semester hours of biological sciences (recommended courses include embryology, histology, microbiology), 3 semester hours of cell biology or molecular biology, 3 semester hours of human anatomy, 3 semester hours of human physiology, 6 semester hours of chemistry, 6 semester hours of physics (including principles of light, heat, electricity, mechanics, and sound), 3 semester hours of statistics, 6 semester hours of psychology (recommended courses include abnormal psychology, child, or developmental psychology), and 9 semester hours of humanities/social sciences (recommended courses include scientific and technical writing, and social anthropology). Human anatomy and human physiology courses must be completed within five years of the date of the application. All prerequisite courses must be completed with a grade of C or better. No prerequisite credit can be given to courses showing a Pass/Fail grade. A baccalaureate degree in the natural sciences is not a requirement for admission; however, a background of coursework in the natural sciences is strongly recommended.

**Application Procedures**. Application materials are available from July through December 1 each year, and may be obtained by writing: Admissions Secretary, Duke University Medical Center, Doctor of Physical Therapy Division, DUMC, Box 3907, Durham, NC 27710, (919) 681-4380. The application and all supporting documents must be post-marked no later than December 1 of the year preceding admissions. The application must be received in the department within 14 days of the December 1 postmark. The application fee is $75. An early application deadline of November 1 will require a reduced application fee of $65. Fall semester transcripts containing any prerequisite course work must be submitted as soon as they are available. Only students for full-time study are accepted. State residence does not influence admissions policies or tuition costs.

Web-based application is available, and we encourage applicants to complete an electronic application, located at *http://dukehealth1.org/dpt/application.asp.*

**Tuition and Expenses.** The faculty of the Doctor of Physical Therapy Division practice a "need-blind admissions process," with adequate financial aid for those students with financial need. The tuition for the 126 credits of the program is budgeted in three annual payments of 42 credits/year. The approved costs will be available from the Office of Financial Aid in May prior to admissions in the fall. Detailed student budgets are provided for all interviewed applicants.

**Financial Aid**. Qualified applicants may be eligible for federal educational loan programs or institution-based loans. A small amount of need-based scholarship awards is available for selected matriculated students. Financial aid information is available for all interested applicants by contacting the Office of Financial Aid, Box 3067, Duke University Medical Center, Durham, NC, 27710, or at the School of Medicine's Office of Financial Aid website: *http://finaid.mc.duke.edu/.*

# Courses of Instruction

**PT-D-301. Human and Clinical Anatomy**. This course is devoted to the study of regional gross structure and function of the human body. The emphasis is on the relationship between structure and function of the neuromusculoskeletal system and the clinical implications of dysfunction. The student is also introduced to clinical problem identification through discussion of the anatomical bases for somatic dysfunction. Credit: 5.

**PT-D-302. Surface Anatomy -Palpation.** This course is devoted to the study of surface anatomy and palpation of the human body. The emphasis is on the location of important regional and local bony

and soft tissue structures, including bony landmarks, joint spaces, muscles, ligaments, bursae, nerves and vessels, and the demonstration of appropriate palpation techniques. This course is coordinated with PT-D 301, Human Clinical Anatomy. Credit: 1.

**PT-D-303. Histology, Embryology and Tissue Biomechanics.** This course covers tissue structure and major function of the cells and tissues of the body. Topics in this course include: structure and function of the cells and tissues of the body, tissue diversity, histology of major organs, basic cellular anatomy, developmental biology/embryology, cell structure, function, cell diversity, and cell communication. The course covers topics of embryology from conception through birth. The course also presents the basic science of tissue biomechanics and the response of muscle, bone, joints, and soft tissue to disease and injury. The normal repair process and the effects of the physical therapist's interventions including rest, stress, stretch, resistance, immobilization, and work are discussed. Complications and benefits of interventions, the effects of nutrition, aging, exercise, and immobility are discussed. Credit: 3.

**PT-D-304. Normal Human Development.** This course covers human development from birth to death, including its physical, psychological, social, and economic aspects. Emphasis in the course is on physical development. The course highlights the diversity of development among individuals and cultures. Credit: 2.

**PT-D-305. Physical Therapist Interventions I**. In this course students will be introduced to a variety of basic physical therapy skills. Early observation, communication, teaching and safety procedures, including body mechanics and universal precautions, are covered. Emphasis is placed on psychomotor performance including transfers, gait training, positioning, bandaging, and basic patient handling skills. Medical terminology is introduced and vital signs assessment is taught. Basic, but complete, competencies in goniometry and Manual Muscle Testing are expected. Credit: 3.

**PT-D-306. Professional Development Seminar.** This course will orient the student to the role and function of the physical therapist in contemporary health care with an awareness of ethical principles, historical foundations of the profession, current health care issues, and health economics. The course introduces the patient management model in physical therapy including patient examination, evaluation, diagnosis, prognosis, intervention, and outcomes. It will include a discussion of practice policies, models of disability, models of clinical decision-making, and documentation. Students will develop initial skills in patient interviewing and note writing. Credit: 2.

**PT-D-307. Movement Science I/Biomechanics.** This course addresses basic concepts relating to the architectural design and function of synovial and non-synovial joints, the morphology and function of skeletal muscle, observational joint and movement analysis, anthropometry, and biomechanical force systems. Free body diagrams as well as trigonometric and algebraic functions are used to solve biomechanical problems related to physical therapy practice. Emphasis is on static analysis of both stationary and moving bodies. Credit: 3.

**PT-D-308. Clinical Experience I.** This course will serve as the initial entry point into the clinical environment. A variety of patient types and settings will be observed during four full-day (eight hours) experiences. Emphasis will be placed on integrating didactic information and developing psychomotor skills in the clinical setting. Students will also be exposed to a variety of professional practice issues and roles of physical therapists. Licensed clinical and/or academic faculty will provide direct supervision of the students. The supervisory model for this experience will not exceed 4 students: 1 clinical instructor. Credit: 1.

**PT-D-311. Neurosciences.** This course covers the anatomy and physiology of the nervous system. The student is introduced to concepts and terminology. Detailed neuroanatomy of the peripheral and central nervous system is presented. The neurophysiological basis of motor control is addressed, including sensory and motor systems, memory, cognition, and neural plasticity. Lectures, laboratory exercises, and problem-solving sessions are included. Credit: 4.

**PT-D-312. Pathology.** In this course, an introduction to diseases commonly seen in patients receiving physical therapy will be presented. Body responses to injury and disease will be traced from the cellular level to the systems level. Typical disease processes in theses areas are covered: pulmonary, cardiac, neurological, infectious, genetic, immunosuppressive, metabolic, and metastatic. Credit: 3.

**PT-D-313. Physical Therapist Interventions II.** This course covers strategies and techniques to manage pain, edema, loss of normal motion, tissue dysfunction, and weakness through direct interventions. Interventions include: strength training, stretching, soft tissue mobilization, and exercise training. The effects of exercise across the lifespan are discussed. Credit: 4.

**PT-D-314. Integumentary Practice Management.** This course will present the practice management model for patients with pathology or impairment of the integumentary system. The role of the physical therapist as a primary care practitioner in examination, evaluation, and intervention will be stressed. The continuum of impairment of functional limitation to disability will be presented. Credit: 2.

**PT-D-315. Cardiopulmonary Practice Management.** This course gives an overview of the related pathologies of the cardiovascular and pulmonary system, examination and evaluation procedures, diagnostic procedures, goal setting, interventions, and patient management. A major focus of this course is laboratory sessions applying cardiovascular and pulmonary evaluation and intervention procedures such as airway clearance and exercise testing. This course covers the principles of training, exercise, and health promotion related to the cardiovascular and pulmonary systems. Credit: 3.

**PT-D-316. Clinical Examination, Evaluation, Diagnosis and Prognosis.** This course gives students skill in observation, communication, gross screening of posture, gait, function, integument, neurological, and musculoskeletal status. Additionally, students acquire skill in specific examination of flexibility, joint range (goniometry), anthropometric measures, and muscle strength (MMT). This course further provides opportunity for students to integrate material in determining patient problems and establishing an initial plan of care. Credit: 3.

**PT-D-317. Evidence-based Practice I.** In this course, students will be introduced to the science of clinical reasoning in health care and physical therapy, and the integration of clinical reasoning and evidence-based practice will be developed. Students will then learn how to access knowledge for practice, and will learn the methods of scientific inquiry, including research theory, design, methods, and measurement. Students will read research literature weekly and participate in a critical appraisal of the selected research methods and the meaningfulness of the findings for clinical decisions. Credit: 3.

**PT-D-318. Clinical Experience II.** This course will continue to reinforce principles learned throughout the program to date. Under the guidance of licensed clinical faculty, students will integrate concepts, principles, and techniques with emphasis on interventions learned during the first spring semester. The structure of this phase of clinical education will consist of four full days in the clinic. The focus will be on the practice areas of cardio-pulmonary and integumentary care. Students will spend two consecutive days in each of the above practice areas where they can experience and learn how physical therapists function in these environments. The supervisory model for this experience will not exceed 3 students: 1 clinical instructor. Credit: 1.

**PT-D-321. Movement Science II/Motor Control.** Current concepts of motor control and motor learning are synthesized from multiple disciplines to provide a framework for physical therapy practice. Neurological mechanisms are examined and integrated with other physiological, psychological, and biomechanical contributions to movement and function. The role of task and environment in the control of movement is also analyzed. Credit: 2.

**PT-D-322. Arthrological and Pathological Movement Science I.** A critical examination of the morphology and function of the articulations of the axial skeleton and upper limb. Course content stresses normal musculoskeletal movement of each of the pertinent segments as well as the pathomechanics of selected trunk and upper limb musculoskeletal anomalies resulting from congenital malformations, bone and soft tissue injuries, or disease. The course exposes students to kinematic and kinetic analysis of selected movement patterns pertinent to clinical practice. Credit: 3.

**PT-D-323. Diagnostic Imaging.** The study of the principles, procedures, and interpretation of diagnostic imaging techniques. Primary emphasis will be on plain film radiography of musculoskeletal injuries and conditions with secondary emphasis on computerized tomography scans, magnetic resonance imaging, bone scans, myelograms, and other nuclear medicine procedures. Credit: 3.

**PT-D-324. Musculoskeletal Practice Management I.** This course is designed to expand the knowledge base of the student into the specialized area of Musculoskeletal Practice Management with

emphasis on the cervical spine and upper extremities. Direct physical therapist intervention for patient examination, evaluation, diagnosis, prognosis, and intervention will be presented. Credit: 4.

**PT-D-325. Medical Practice Management.** This final physical therapist intervention course will cover strategies and techniques to manage pain, edema, loss of normal motion, soft tissue dysfunction and weakness through direct interventions. Interventions include: basic exercise, soft tissue mobilization, relaxation, splinting and compression garments, athermal modalities, cryotherapy, deep thermal modalities, electrotherapeutic modalities, and hydrotherapy. Credit: 3.

**PT-D-326. Physical Therapist Interventions III.** This course introduces students to an evidence-based approach to the use of therapeutic physical agents; that is, the literature that supports or refutes the use of each physical agent will be discussed. An algorithm is presented to facilitate accurate classification of the patient's impairments and functional limitations. In addition, the role of pain and joint effusion in inhibition of function is presented. Specifically, students will learn and understand the scientific bases of commonly used therapeutic physical agents in physical therapy practice. The physiological effect of each therapeutic physical agent will be discussed and specific reading will be available. Laboratory sections will require students to demonstrate specific competencies in the use of the agents. Students will use a case-study format to demonstrate the competency of the material. Credit: 3.

**PT-D-327. Patient/Client Management Seminar I.** In this seminar course, students will expand on their ability to integrate knowledge from various content areas in the analysis of patient cases, and will further develop their skills in the integration of clinical reasoning and evidence- based practice. The seminar format will include presentation of written, video, computer, and live patient cases followed by discussion of diagnostic, prognostic, and intervention aspects of the case. Analysis and critique of cases will address the clinical and scientific information presented in each case, synthesis of the information, strength of the conclusions, areas needing further investigation, and issues regarding decision-making and intervention in the context of the current state of knowledge. An interdisciplinary format will be encouraged, with students required to attend and report back on 2-3 Medical Center Conferences / Grand Rounds as part of this course. Credit: 2.

**PT-D-328. Clinical Internship I.** This first, full-time clinical experience will consist of a four-week learning experience in an inpatient setting, including: acute care, subacute, or skilled nursing. The focus of the experience will be the development of psychomotor skills, professional behaviors, gross and specific examination, and intervention procedures and documentation skills. Exposure to the multiple roles of the physical therapist will be emphasized (e.g., administration, case management, consultation). The student will be supervised by a licensed physical therapist. The supervisory model for this experience will not exceed 2 students: 1 clinical instructor. Credit: 1.

**PT-D-402. Arthrological and Pathological Movement Science II.** The goal of this three-hour a week course is to learn and to understand the relationships of lower extremity Arthrology to the normal, impaired, and pathological gait patterns. The course is composed of the following sections: 1) Hip and SI Joints, 2) Knee Joint, 3) Ankle and Foot Joints, 4) Normal Gait, 5) Impaired and Pathological Gait Patterns. Specifically, sections 2-5 will consist of lecture. Students will be prepared to discuss specific unit objectives and reading assignments for clarification as needed in "Discussion Sessions." Students will assume an active role in the "Discussion Session," as the instructor facilitates problem-solving and clarifications if needed. Laboratory sessions will require students to demonstrate specific competencies. Students will analyze video tapes of normal, impaired and pathological gait patterns. Credit: 3.

**PT-D-403. Musculoskeletal Practice Management II.** This course is designed to expand the knowledge base of the student in the specialized area of Musculoskeletal Practice Management with emphasis on the thoracic spine, lumbar spine, pelvis and lower extremities. Credit: 4.

**PT-D-404. Neurologic Practice Management I.** An introduction to management of children and adults with neuromuscular disorders is presented. Examination, evaluation, diagnosis, prognosis, and intervention are discussed. Peripheral neuromuscular (e.g., muscular dystrophy, brachial plexus injury) and spinal cord disorders (e.g., spinal cord injury, spinal bifida) are included. Credit: 5.

**PT-D-405. Evidence-based Practice II.** This course is comprised of two complementary subunits. In the Analytical Basis of Inquiry sub-unit, students will learn the logic of hypothesis testing and

specific statistical tests used for descriptive and inferential analysis of research data. Students will read research literature weekly and discuss the analytical approaches that support the research findings. In the Critical Appraisal of Evidence for Practice sub-unit, students will build on their knowledge of research methods and learn to critically appraise the evidence for physical therapy practice by: developing an answerable clinical question, identifying the best research evidence, and assessing the quality of the evidence. In addition, epidemiological statistics that enhance the understanding of diagnostic tests and treatment options will be covered. In both units, students will use statistical software to build skills in data analysis with practice data sets. Credit: 3.

**PT-D-406. Patient/Client Management Seminar II.** The goal of this two-hour a week seminar course is to learn the cognitive components and psychomotor skills required to perform a patient/client interview in the most efficient and valid manner. The class is divided into smaller group interactions and discussions. Students complete specific readings on the three components of the patient/client interview process. After students read the assignments, small group discussions will occur where the students actively explore the topics. Then, at the next class meeting, students practice the interviewing techniques while being video- or audio-taped. At the next class meeting, "Demonstration of Core Skills Lab," students demonstrate their mastery of the core skills practiced in the previous class while being video- or audio-taped. Verbal critiques from the professor and peers will be provided. The final and midterm examinations will each consist of a 15-minute video-taped interview of a patient with a written self-critique that provides strategies to improve the student's own performance. Credit: 2.

**PT-D-411. Psychosocial Aspects of Care.** In this course, students will survey the various factors affecting the patient, the family, and the physical therapist relationship in situations of chronic illness and loss. Students will increase skill in developing an effective helping relationship with other people. Experiential learning experiences and self-observation will be used to promote this development. Credit: 2.

**PT-D-412. Neurological Practice Management II.** The study of management of children and adults with neuromuscular disorders is continued with emphasis on more complex CNS and multisystem disorders. Examination, evaluation, diagnosis, prognosis, and intervention are discussed. Both concepts and skills are addressed. Acquired injuries (e.g., cerebrovascular disease, traumatic brain injury), degenerative disorders (e.g., Parkinson's disease, multiple sclerosis) and congenital disorders (e.g., cerebral palsy) are included. Credit: 5.

**PT-D-413. Educational Theory and Practice.** In this course, principles of teaching and learning will be introduced and applied to the health care setting. Students will learn to use a variety of teaching methods selected and developed for a specific audience. Students will formulate and implement a plan for facilitating personal behavioral change. Credit: 2.

**PT-D-414. Administration I.** The study of administrative styles in the healthcare delivery system. Emphasis on management analysis in professional settings of hospitals, long term care facilities, home care, private practice, and community-based programs as related to business operations, budget development, and personnel management. Credit: 3.

**PT-D-415. Patient/Client Management Seminar III.** In this course students will be introduced to the management of patients who require prosthetic or orthotic assistive devices. Students will complete readings outside of class and participate in problem-solving laboratories with patients who use these assistive devices. Additional case studies will be presented on patients with a variety of complex diagnoses, and students will analyze the clinical decisions that are crucial to each case. Credit: 2.

**PT-D-416. Clinical Internship II.** This 20-week clinical internship may occur in varied settings under the supervision of a selected and trained clinical instructor, and following a written curriculum. The required focus of this clinical experience will be in either the musculoskeletal or neuromuscular practice areas. Under supervision, students will learn skills in all components of the physical therapy practice management model, including conducting patient examinations and evaluations, establishing patient diagnoses and prognoses, conducting patient interventions, and measuring patient outcomes. When possible, students will experience patients in these practice patterns who are across the range of acute to chronic conditions. Students will practice all administrative aspects of their professional roles during these internships, and will learn the components of safe, ethical, and efficacious practice. Per-

formance expectations will include safe and effective examination, evaluation, diagnosis, prognosis, intervention, and patient management skills. Students will complete a variety of learning experiences during this internship related to patient care, teaching, and research. The maximum supervisory ratio for this course will be 2 student interns: 1 clinical instructor. Credit: 4.

**PT-D-501. Clinical Pharmacology and Nutrition.** This course will introduce students to the basic principles of pharmacology and nutrition. Study of pharmacologic intervention and nutritional practices for patients commonly seen in physical therapy is included. Credit: 2.

**PT-D-502. Administration II.** The study of various aspects of the operations of a business. Personnel aspects to be studied are: interviewing, negotiating, hiring, training, promoting, and terminating personnel. Professional development and mentoring as related to quality practice will be emphasized. Business aspects will include development of new programs and services, problem-solving techniques, and quality improvement programs. Emphasis will be placed on customer service methodology. Credit: 3.

**PT-D-503. Primary Care Practice.** This course explores the related concepts of direct access to physical therapy care, autonomous/independent physical therapist practice, and physical therapists in the roles of point-of-entry or primary care providers. Examples of direct access physical therapist practice in the United States are covered as well as the legal, political, ethical, and liability issues surrounding the concept of direct access.

This course is designed to allow the student to integrate the coursework and clinical experiences thus far in the curriculum in the context of the practice of physical therapy without physician referral. To that end, students apply the principles of screening for medical disease or conditions and decision-making regarding referral to a physician or another health care provider, when their examination and evaluation of a patient warrants this action via case examples and case presentations based on their own clinical experience. In addition, students are exposed to several complementary and alternative medicine (CAM) disciplines in order to increase their understanding of what type of care the patient may be receiving when being treated by a CAM practitioner. Credit: 3.

**PT-D-504/505. Practice Elective I and II.** In these courses, students will choose two electives in which to deepen their knowledge base for practice. Practice electives will be offered in: pediatrics, geriatrics, orthopaedics, sports, cardiopulmonary, neurology, education, research, and administration. Credit: 3; 3.

**PT-D-506. Clinical Internship III.** This 20-week clinical internship may occur in varied settings under the supervision of selected and trained clinical instructors. The required focus of this clinical experience will be in either the musculoskeletal or neuromuscular practice areas, depending on the previously completed internship (PT-D-416). Under supervision, students will learn skills in all components of the physical therapy practice management model, including conducting patient examinations and evaluations, establishing patient diagnoses and prognoses, conducting patient interventions, and measuring patient outcomes. When possible, students will experience patients in these practice patterns who are across the range of acute to chronic conditions. Students will practice all administrative aspects of their professional roles during these internships and will learn the components of safe, ethical, and efficacious practice. Performance expectations will include safe and effective examination, evaluation, diagnosis, prognosis, intervention, and patient management skills. Students will complete a variety of learning experiences during this internship related to patient care, teaching, and research. The maximum supervisory ratio for this course will be 2 student interns: 1 clinical instructor. Credit: 4.

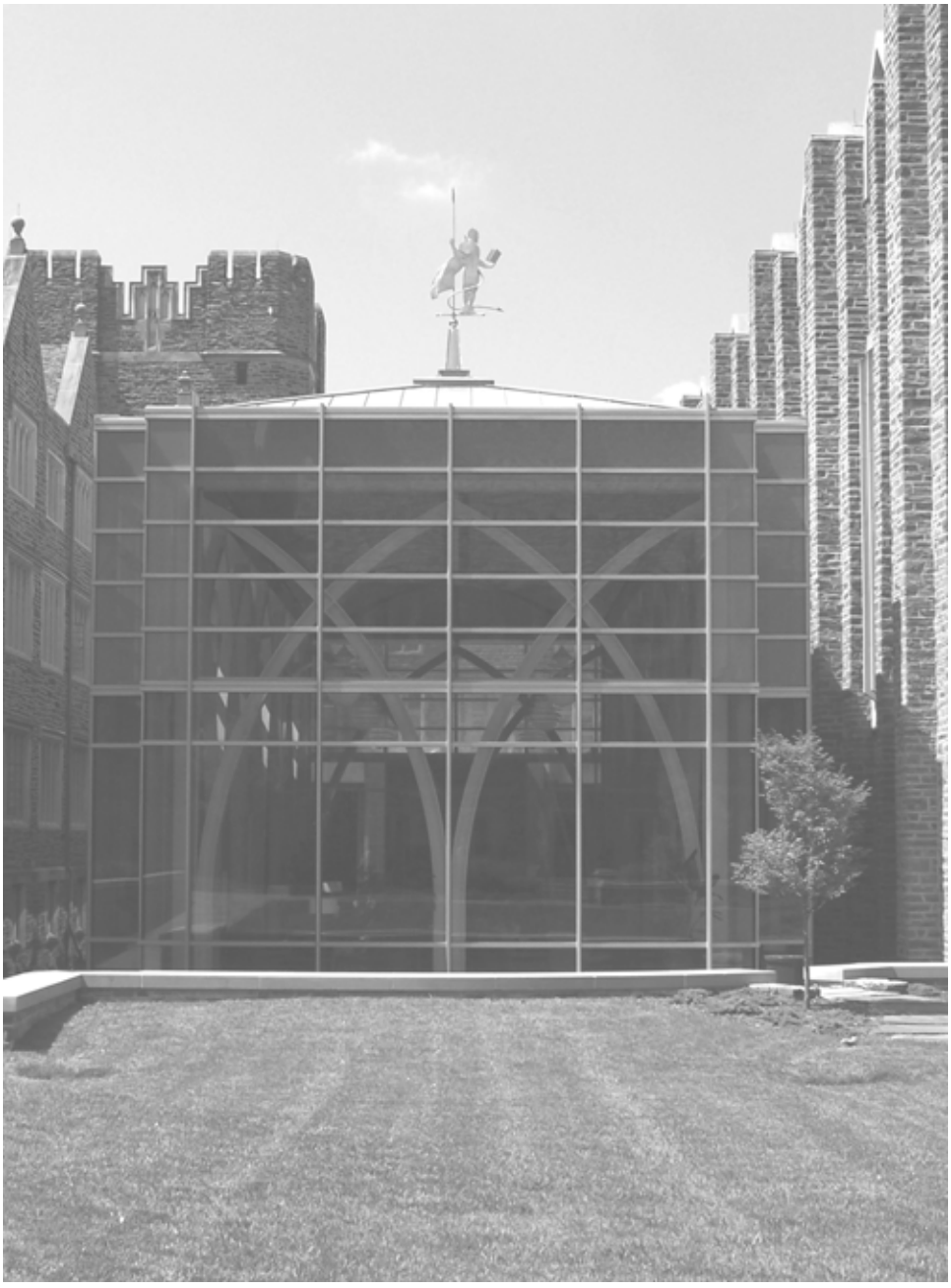
**PT-D-507. Professional Practice Development and Evaluation.** This course will require students to read about and discuss the concept of professionalism and interpret this concept for their own careers. Students will integrate the didactic, clinical, and research components of their experience in preceding course work, with the goal of evaluating their strengths and weaknesses for professional practice. Students will develop skills in self- assessment and planning for continuous professional development in five areas of physical therapy: teaching, research, administration, clinical practice, and service. Credit: 3.

**PT-D-508. Evidence-based Practice III.** This course will provide students the opportunity to finalize their research or scholarly project in written form and complete a formal research presentation

of their project results. The role of critical inquiry and evidence-based practice will be discussed, including the development of practice policies and the use of evidence to support clinical decisions. Students will discuss strategies to change practice at the grass roots level and will develop a plan to foster their growth as scholarly practitioners. Credit: 3.

**PT-D-509. Health Promotion and Injury Prevention.** In this course, the student will learn to identify and assess the health needs of individuals, groups, and communities through screening for prevention of injury, developing wellness programs, and triaging appropriate patients for physical therapy. The student will be able to design and execute programs to promote optimal health by providing information or consultation on many aspects of health risks and disability. The student will be exposed to a multidisciplinary approach to health promotion and injury prevention and will participate in an existing program. Credit: 3.

# *Master of Health Sciences Degree Programs*



# The Clinical Leadership Program

## MASTER OF HEALTH SCIENCES CURRICULUM

### Department of Community and Family Medicine

Chairman: J. Lloyd Michener, M.D.

Program Director: Michelle J. Lyn, M.B.A., M.H.A.

Clinical Leadership Program Steering Committee:

Ruth Anderson, Ph.D., R.N., C; Steven J. Bredehoeft, M.D., M.P.H.; Mary T. Champagne, Ph.D., R.N.; Christopher Conover, Ph.D.; Clark C. Havighurst, J.D.; J. Lloyd; Michener, M.D.; Gwendolyn Murphy, Ph.D., R.D.; Kevin A. Schulman, M.D., M.B.A.; Justine Strand, M.P.H., PA-C; Duncan Yaggy, Ph.D.; Susan Yaggy, MPA

The Clinical Leadership Program is designed to provide clinicians with the skills necessary to become leaders within today's changing health care environment. The MHS-CL, offered through the School of Medicine's Department of Community and Family Medicine in collaboration with Duke's Fuqua School of Business, Law School, Terry Sanford Institute for Public Policy, and the School of Nursing provides a comprehensive core curriculum that includes, from a health delivery perspective, management theory, health care administration, financial management, economics, law, organizational behavior, informatics, quality management, and strategic planning.

**Curriculum.** The Clinical Leadership Program offers participants an unparalleled educational experience that addresses the many disciplines effective leaders must master and practice in health care administration: financial management, economics, law, organizational behavior, informatics, quality management, and strategic planning. Whether it is by leading a service-oriented integrated health system, rural practice, or community clinic, the factors for study and research (such as clinical integration, community outreach, and consumer empowerment) are a constant.

This 43 credit-hour, two-year professional degree program awarded by the Duke University School of Medicine allows participants to continue practicing in their profession while attending courses on the Duke University campus or online. Those accepted into the program complete a longitudinal policy project and a seminar experience that give students the opportunity to explore topics in more depth outside the classroom setting. These experiences also allow the student to customize the program to meet individual needs.

Whether participating in the on-campus option or the online distance-based option, Clinical Leadership students move through the program as an integrated team or cohort. The cohort creates an exceptional peer learning experience which results in relationships that continue throughout one's professional and personal life. Shared experiences through team problem-solving and project collaboration form lasting professional and personal bonds. This can be one of the most rewarding outcomes of the program. The structure of the cohort enables classmates to start the program together and continue through the curriculum together. Because the class size is limited, students receive individual attention from faculty members.

**Prerequisites for Admission.** The prerequisites for admission to the MHS in Clinical Leadership curriculum include:

1. A clinical degree such as MD, PA, NP, or the equivalent.
2. Three years post-training clinical experience or the equivalent.
3. Prior preparation in statistics. A list of course offerings as well as online/self-paced tutorials is provided for students who do not have such training.

4. Prior experience in budgeting.
5. Computer skills must include proficiency with word processing, e-mail, spreadsheets, Internet research, and presentation programs. All students in the MHS-CL are required to have their own current model PC with Internet Access.
6. Students participating in the online distance-based option must have a broadband connection to the internet (either DSL, Cable, or Satellite). Minimum system requirements of a Windows based system with 800mhz processor, 256 mg memory. Storage space to install and run required software. Software used: Current internet browser (ie MS Internet Explorer, Netscape Navigator, Mozilla Firefox). Communication software: NetMeeting, Polycom PVX.
7. Administrative experience desirable.

**Admissions Procedures.** Applicants seeking admission either as a degree candidate or as a non-degree participant should submit the application form and the following supporting documents.

1. Official transcripts from each post-secondary institution attended. Transcripts must be sent by the institutions attended directly to the Clinical Leadership Program. Personal copies are not accepted.
2. Three letters of recommendation, including one from an individual with direct knowledge of the candidate's clinical experience and one from someone with direct knowledge of the candidate's administrative experience. All letters should be written by persons who are qualified to testify to the candidate's capacity for graduate work. The provided evaluation forms should be mailed to the Clinical Leadership Program directly by the evaluators.
3. Applicants who do not possess a graduate degree are required to provide Graduate Record Examination (GRE) General (Aptitude) Test results. Scores must not be more than five years old, and must be mailed directly to the Clinical Leadership Program from the Educational Testing Service.
4. Proof of current practice licensure. In addition, candidates must maintain licensure throughout enrollment in the Clinical Leadership Program.
5. Applicant finalists are required to complete an admissions interview.

**Application Deadline.** The deadline for receipt of applications for the 2006-2007 academic year is July 1, 2006. Since enrollment is limited, late applications cannot be guaranteed consideration. All application material, a $100.00 application fee, and correspondence concerning your application should be sent to the Clinical Leadership Program, Department of Community and Family Medicine, Box 2914, Duke University Medical Center, Durham, NC 27710. Applicants will be notified of admission decisions not later than August 1, 2006. Materials submitted in support of an application will not be released for other purposes and cannot be returned to the applicant.

**Costs and Financing.** Tuition for the 2006-2007 academic year is $900.00 per unit. Duke faculty members may be eligible for the University's Educational Assistance Program. Other sources of support may exist in clinical departments; prospective applicants should consult with program directors and division chiefs regarding potential funding sources.

**Financial Aid.** Qualified students may be eligible for Stafford Loans up to $8,500, and up to $10,000 in tuition loans. Clinical Leadership students may be eligible for up to $10,000 in unsubsidized federal Stafford Student Loans. The North Carolina Student Loan Program for Health, Science, and Mathematics provides financial assistance in the form of loans up to $6,500 per year for North Carolina residents; these loans may be cancelled through approved service in shortage areas, public institutions, or private practice. Applicants may call (919)571-4182 for further information about this loan program. Limited scholarships funds are also available. All financial aid awards are made on the basis of documented financial need. Financial aid application packets are distributed on the admissions interview date. Additional information is available from the Office of Financial Aid at (919) 684-6649.

This program is part-time. It is assumed that the candidate will continue to work in a clinical capacity while working toward the Master of Health Sciences in Clinical Leadership.

**Grading Policies.** Grades for all courses and clinical rotations within the Clinical Leadership curriculum are assigned on the basis of the following: Honors (*H*), Pass (*P*), Low Pass (*L)*, and Fail (*F)*.

The Clinical Leadership Program is designed to integrate classroom and clinical learning experiences considered necessary for competency as health care providers. Therefore, the failure of any required course prevents a student from continuing in the program. Also, a student can receive no more than a total of three grades of "Low Pass" in the fifteen required courses.

A grade of "Incomplete" (*I)* may remain on a student's transcript for one year only. After one year, a grade of "Incomplete" is automatically converted to an *F* (Fail). An extension to this one year limit may be granted by the program director; a request must be submitted in writing to the program director no later than 30 days prior to the expiration of the one year time limit.

**Satisfactory Academic Progress.** Satisfactory academic progress for students in the Clinical Leadership Program consists of the successful completion of all requirements necessary for the advancement from one semester to the next. This includes successful completion of the Clinical Leadership Seminar and at least one core course each semester. During the Clinical Leadership longitudinal project period the student must maintain consistent progress with their cohort in meeting designated project deadlines. In unusual circumstances (including illness, academic remediation, or irregular sequencing of courses) the determination of satisfactory progress for academic purposes is made by the program director of the Clinical Leadership Program.

For financial aid purposes, federal regulations establish the maximum time frame for completion of the program at 150 percent of the minimum time required to complete the program. Any student exceeding the 150 percent maximum time frame is ineligible for Title IV (Stafford and Perkins loans) student financial aid funds.

**Attendance and Excused Absences.** Students are required to attend all lectures and seminars and complete all assignments. Absences are excused only for illness, personal emergency, or emergency clinical schedule conflict. Students must notify program faculty in advance of an expected absence.

**Leave of Absence.** A leave of absence will be granted upon request at the discretion of the Steering Committee.

**Withdrawal.** If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

Before classes begin: Full amount

During first or second week: 80%

During third to fifth week: 60%

During sixth week: 20%

After sixth week: none

Student fees are nonrefundable after classes begin.

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the Offices of the Registrar and Financial Aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure that they have fulfilled any responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date.

# Courses of Instruction

**CLP-200. Perspectives on Health Care.** Under the direction of a senior faculty leader, students will explore the principles behind the forces impacting the dynamic health care environment. Building upon topics covered in the complementary core course, "Population-Based Approaches to Health Care," students will be exposed to current issues and strategies regarding population analysis and decision-making through the use of case studies and interaction with leaders in health care planning, financing, and programming. *TBA*, Credit: 2.

**CLP-201. Health Care Finance: Barriers and Opportunities for Change.** This seminar will focus on leadership skills for effecting change while demonstrating sound fiscal judgment. Students

will apply financial management and budget planning skills gleaned from the complementary core course, "Fundamentals of Healthcare Finance," as well as management theory covered in "Managing Complex Health Care Systems," to case studies and current situations of various health care settings. Duke Health System leaders will expose students to examples from the evolution of and current issues facing health systems as a basis for exploring management principles and leadership skills for effecting change that reflects fiscal responsibility. *TBA,* Credit: 2.

**CLP-202. Organizational Structure and Use of Data to Support and Manage Change.** Through interaction with leaders from the private and public health care sectors, students will analyze the current state of health care delivery in the United States with a focus on the impact of changing organizational structures and rapidly advancing technologies. To provide further exploration of specific topics covered in the core courses, "Introduction to Health Care Policy" and "Introduction to Medical Informatics," discussion leaders will focus on the health care workforce, the economic framework of the health care industry, changing private and public responsibilities, and opportunities for entrepreneurial endeavors. *TBA,* Credit: 2.

**CLP-203. Management of Self.** Students will be challenged to apply the skills and knowledge they have acquired through the program to develop a strategic career management plan. The plan will include statements of a personal vision, mission, and values; a description of identified strengths and weaknesses; and strategies to achieve goals, including strategies to overcome weaknesses that would impede the student's professional performance. *TBA,* Credit: 2.

**CLP-204. Leading in a Chaotic Environment.** Students will meet with industry experts on health care law and policy to work through case studies in risk, regulation, and antitrust. *TBA,* Credit: 2.

**CLP-205. Clinical Leadership Project.** The Clinical Leadership Project helps a real client decide what to do about a problem in health policy, financial planning, or administration. Its purpose is to recommend and defend a specific course of action. Students work as part of a team to complete the project. The project is divided into two parts, with the first semester being devoted to client and problem identification and developing and defending a written prospectus. The second semester is devoted to the completion and final defense of the project in its entirety. *TBA,* Credit: 3, 3.

**CLP-206. Quality Measurement and Management.** The course provides a survey of all related aspects of quality management including a review of HEDIS, NCQA, JCAHO structures and guidelines. Special emphasis is placed on outcomes, clinical guidelines, evidence–based medicine, disease management, interdisciplinary team care, CQI/TQM, role of purchaser, and patient satisfaction. *Bradley*, Credit: 3.

**CLP-207. Operational Management.** The course covers the practical aspects of communication, meeting management, and human resource management. Topics include performance appraisal, conflict management, demand management, aligning incentives, labor substitution/consolidation, role of extenders, analytical decision-making, project management, and process (systems) analysis. *Michener*, Credit: 3.

**CLP-210.** Strategy and Strategy Implementation in Healthcare. The course offers a comprehensive application of the fundamentals of strategy by examining new and previously discussed concepts and techniques in the Masters in Clinical Leadership curriculum as they apply to recognizing core competencies, serving customers, managing competition, and facilitating growth. *Sangvai and Michener*, Credit: 3.

**CLP211. Fundamentals of Healthcare Finance.** This course provides a background to healthcare finance including basic corporate finance, financial and cost accounting, and investment. Students will develop sound financial management and budget planning skills. *Sangvai and Lyn*, Credit: 4.

**LAW-347. Health Care Law and Policy.** A survey of the legal environment of the health services industry in a policy perspective, with particular attention to the tensions and trade-offs between quality and cost concerns. Topics for study: access to health care; the clash between professionalism and commercialism, including antitrust law; personnel licensure; private personnel credentialing and institutional accreditation; hospital organization and staff privileges; professional and institutional liability; cost containment regulation, including certification of need; cost controls in government programs.

Of interest to students interested in public policy, law and economics, as well as those with specific interests in the health care field. *Havighurst,* Credit: 3.

**MEDINFO-333B. Introduction to Medical Informatics.** An in-depth study of the use of computers in biomedical applications. Important concepts related to hardware, software, and applications development are studied through analysis of state-of-the-art systems involving clinical decision support, computer-based interviewing, computer-based medical records, departmental/ancillary systems, instructional information systems, management systems, national data bases, physiological monitoring, and research systems. *Murphy,* Credit: 3.

**HLTHMGMT 326.401. Economics of Health Care.** This is a course in Health Economics that applies the tools of Microeconomic Theory to examine the market behavior of consumers and firms in the health care sector. The focus is on analyzing the economic fundamentals behind the actions and reactions of the players in the health care market. The emphasis will be on acquiring a tool kit that will enable a structured and analytical examination of the issues rather than a review of the issues per se. On the demand side, the course will analyze the economic factors affecting medical care utilization. The role of health insurance will be explored in detail. The course will examine the supply of health insurance and the rising costs of medical care. The growth of the managed care industry will be studied, as will the economic issues underlying the operation and performance of hospitals and group practices. In conclusion, the role of the physician will be analyzed through an economic lens. *Khwaja,* Credit: 3.

**NUR-301. Population-Based Approaches to Health Care.** Provides an overview of population-based approaches to assessment and evaluation of health needs. Selected theories are the foundation for using scientific evidence for the management of population-based care. Enables the health care professional to make judgments about services or approaches in prevention, early detection and intervention, correction or prevention of deterioration, and the provision of palliative care. Fall. *TBA,* Credit: 3.

**NUR-401. Managing Complex Health Care Systems.** This course is an in-depth analysis of selected organizational behavior topics and management practices related to patient care systems administration within a larger, integrated health care system. From a well developed theoretical orientation, students will critically identify issues, formulate questions, and pursue managerial interventions that will result in high quality, aggregate patient care, and organizational outcomes that are socially relevant and clinically cost-effective. Spring. Prerequisite: NUR 400 or consent of instructor. *Anderson,* Credit: 3.

**NUR-402. Financial Management and Budget Planning.** Designed for managers in complex organizations. Focuses on the knowledge and skills needed to plan, monitor, and evaluate budget and fiscal affairs for a defined unit or clinical division. Health care economics, personnel, and patient activities are analyzed from a budgetary and financial management perspective within an environment of regulations and market competition. NURSING 303 recommended. Spring. *TBA,* Credit: 3.

**PHYASST-450. Introduction to Health Care Policy.** An introduction to the U.S. health care system. A lecture series taught by an interdisciplinary faculty and by community experts in health care policy and organization. Topics include major determinants of health disparities, how health care is organized, delivered and financed in the U.S., health law and regulation, international comparisons and future trends. *Conover, Strand,* Credit: 3.

## Electives

**CLP-208. Faculty Development: Teaching Skills and Curriculum Design. T**his semester-long seminar series is designed for health professionals in academic or leadership roles wishing to improve their teaching, and educational skills. It is also appropriate for fellows considering academic careers. The course uses active discussions supplemented by readings, role plays, observed teaching and peer feedback to assist participants in improving their skills in the following areas: clinical teaching, lecture, small group facilitation, advising, dealing with problem learners, and curriculum design and implementation. Participants complete and present a semester project of a curriculum design suitable for implementation in their own or other program of choice. *Murphy,* Credit: 3.

**CLP-209. Faculty Development: Surviving and Thriving and Academia.** The changing health care environment has put increasing pressures upon health professions faculty. Similar forces have created needs for change in both the content and process of our educational programs. This semester-long seminar is designed for health professionals in or considering academic or leadership roles. The course uses discussion supplemented by readings, role plays, problem-solving exercises, and peer feedback to assist participants in improving their knowledge and skills in the following: negotiation, time management, quality improvement, delegation/supervision, academic writing, finance and budgeting, leadership, and managing change. Participants complete and present a semester project on an administrative issue/problem of their choosing. *Murphy,* Credit: 3.

# The Clinical Research Training Program

## MASTER OF HEALTH SCIENCES CURRICULUM

Program Director: Eugene Z. Oddone, M.D.
Associate Directors: Linda S. Lee, Ph.D. and Gregory P. Samsa, Ph.D.

This Duke University Medical Center program provides formal academic training in the quantitative and methodological principles of clinical research. In contrast to a public health degree which focuses on epidemiology, this program is designed primarily for clinical fellows who are training for academic careers. The program offers formal courses in clinical research design, statistical analysis, medical genomics, research management and responsible conduct of research. Students who complete a prescribed course of study in the training program are awarded a Master of Health Sciences in Clinical Research degree by the School of Medicine.

The Clinical Research Training Program is offered by the faculty of the Department of Biostatistics and Bioinformatics with the participation of other members of the Medical Center faculty who have expertise in relevant areas.

**Degree and Non-degree Admission.** All persons wishing to take courses in the Clinical Research Training Program, even on a non-degree basis, must be admitted to the program. An advanced degree in a clinical health science from an accredited institution is a prerequisite for admission either as a degree candidate or as a non-degree student.

A student seeking admission to the Clinical Research Training Program should obtain an application packet which contains the necessary forms and detailed instructions on how to apply. Requests for application forms or for additional information about the training program should be directed to the Clinical Research Training Program, Box 2721, Duke University Medical Center, Durham, North Carolina 27710, (919) 681-4560 or by email to *crtp@mc.duke.edu*. Additional information may be found on the program's website at *http://crtp.mc.duke.edu*.

A complete application for admission, either as a degree candidate or as a non-degree student, consists of the application form and the following supporting documents: (1) a current *curriculum vitae* (CV); (2) an official transcript from each post-secondary institution attended; (3) three letters of evaluation written by persons qualified to testify to the applicant's capacity for graduate work.

**Program of Study.** The degree requires 24 credits of graded course work and a research project for which 12 units of credit are given. In addition to the 14 credits in four courses (241, 242, 245 and 253) required for the degree (see Courses of Instruction below), the remaining 10 credits must include one of the following clusters of courses: 1) 247 and 254; or 2) 243, 250 and 255; or 3) 243, 255 and 256. The student's clinical research activities provide the setting and the data for the project, which serves to demonstrate the student's competence in the use of quantitative methods in clinical research. The program is designed for part-time study, which allows the fellow/student to integrate the program's academic program with clinical training.

**Examining Committee.** Three faculty members constitute an examining committee to certify that the student has successfully completed the research project requirement for the degree. The committee must include a clinical investigator and a statistician, both of whom are on the faculty of the Clinical Research Training Program (CRTP). The third member of the committee should be a faculty member who has substantive knowledge in the area in which the clinical research project is conducted; for clinical fellows, this committee member is often the student's mentor. The chair of the committee must be a member of the CRTP faculty.

**Grades.** Grades in the Clinical Research Training Program consist of *H* (High Pass), *P* (Pass), *L* (Low Pass) and *F* (Fail). In addition, an *I* (Incomplete) indicates that some portion of the student's work is lacking for a reason acceptable to the instructor at the time grades are reported. Students will not be permitted to enroll in any course for which they have an unresolved *I* in a prerequisite course. In any case, a grade of *I* must be resolved no later than the end of the following academic semester, unless the course director specifies an earlier date by which the student must make up the deficiency. In exceptional circumstances, an Incomplete that is not resolved within the designated period may be extended for a specified period with the written approval of the course director and the program director. If an Incomplete is not resolved within the approved period, the grade of *I* becomes permanent and may not be removed from the student's record.

A student's enrollment as a degree candidate is terminated if he or she receives a single grade of *F* or two grades of *L* in the program. For these purposes, both *WF* (see below) and a permanent *I* are considered to be failing grades.

**Withdrawal from a Course.** A course may be dropped at the student's discretion during the first three weeks of class; no grade is recorded and all tuition is refunded. If a course is dropped later in the term, no tuition is refunded and the status of the student at the time of withdrawal is indicated on the permanent record as *WP* (Withdrew Passing) or *WF* (Withdrew Failing).

**Tuition.** Tuition for the 2006-2007 academic year is $555 per unit of credit. Faculty may be eligible for the university's Educational Assistance Program. Other sources of support exist in some clinical departments; prospective students should consult with program directors and division chiefs regarding potential funding sources.

**Transfer of Credit.** Transfer of credit for graduate work completed at another institution is considered only after a student has earned a minimum of 12 credits in the Clinical Research Training Program. A maximum of six units of credit may be transferred for graduate courses completed at other institutions. Such credits are transferred only if the student received a grade of *B* (or its equivalent) or better. The transfer of graduate credit does not reduce the required minimum registration of 36 credits for the degree. However, a student who is granted such transfer of credit may be permitted to register for as much as 18 credits of research instead of the usual 12 credits.

**Time Limitations.** A degree candidate is expected to complete all requirements within six calendar years of matriculation. Degree credit for a course (including one for which transfer credit is given) expires six years after the course is completed by the student; in this case, degree credit can be obtained only by re-taking the course.

# Courses of Instruction

**CRP-241. Introduction to Statistical Methods.** This course is an introduction to the fundamental concepts in biostatistics and their use in clinical research. Through directed readings and discussion of representative research reports from peer-reviewed journals, students are introduced to the concepts of hypothesis formulation, descriptive statistics, commonly used research designs and statistical tests, statistical significance, confidence intervals, statistical power, and commonly used statistical models. In addition, the basic concepts of data collection and analysis are presented using Microsoft Access and SAS. Credit: 4.

**CRP-242. Principles of Clinical Research.** The emphasis is on general principles and issues in clinical research design. These are explored through the formulation of the research objective and the research hypothesis and the specification of the study population, the experimental unit, and the response variable(s). In addition, the course content promotes an understanding that allows the student to classify studies as experimental or observational, prospective or retrospective, case-control, cross-sectional, or cohort; this includes the relative advantages and limitations and the statistical methods used in analysis of each type. Emphasis is placed on the traditional topics of clinical epidemiology such as disease etiology, causation, natural history, diagnostic testing, and the evaluation of treatment efficacy. In addition, an introduction to ethical issues in clinical research is included. Corequisite: CRP-241. Credit: 4.

**CRP-243. Introduction to Medical Genetics.** This course provides fundamental knowledge in human genetics and genetic systems of the mouse and other model organisms. Topics include: introduction to concepts of inheritance (DNA, chromatin, genes, chromosomes); the human genome (normal genetic variation, SNPs, comparative genomes, molecular mechanisms behind inheritance patterns, and mitochondrial genetics); mouse genetics (classical mouse genetics, genotype- and phenotype-driven approaches, QTL mapping); microarrays (expression, genomic, ChIP (chromatin IP on chip), bioinformatics and use of genome databases); genetic association studies (haplotype blocks, study design in complex disease and approaches to complex disease gene identification, pharmacogenetics and pharmacogenomics). Credit: 2.

**CRP-244. Health Economics in Clinical Research.** A practical foundation in economic evaluation of medical diagnostic procedures and therapeutic interventions is provided. The focus is on the development, analysis, and communication of economic data in the context of clinical research. Topics include: basic finance and organization of health care, evidence tables, utility theory, tree-structured decision models, health care cost accounting, cost-effectiveness, cost-utility and cost-benefit analysis, and special statistical issues in analysis of economic data. Prerequisite: CRP-242. Credit: 2.

**CRP-245. Statistical Analysis.** This course extends CRP-241 (Introduction to Statistical Methods) to more advanced topics relevant in clinical research. Topics include regression models (linear and logistic regression models, their practical applications in assessing multivariable relationships and formulating predictive models, and the interpretation of model parameters), categorical data analysis (methods for analyzing nominal and ordinal response variables), and survival analysis (inferences from time-to-event data with censored observations, including Kaplan-Meier curves, hazard functions, and the Cox proportional hazards regression model). Prerequisite: CRP-241. Credit: 4.

**CRP-247. Clinical Research Seminar.** This seminar integrates and builds on three core courses (CRP-241, 242, and 245) to provide practical experience in the development and critique of the methodological aspects of clinical research protocols and the clinical research literature. Assigned readings are drawn from contemporary literature and include both exemplary and flawed studies. Prerequisites: CRP-242 and CRP-245. Credit: 2.

**CRP-248. Clinical Trials.** Fundamental concepts in the design and analysis of clinical trials are examined. Topics include protocol management, sample size calculations, determination of study duration, randomization procedures, multiple endpoints, study monitoring, and early termination. Prerequisite: CRP-245. Credit: 2.

**CRP-249. Health Services Research.** Research methods in health services research are explored. Topics include measurement of health-related quality of life, case mix and co-morbidity, quality of health care, and analysis of variations in health care practice. The course emphasizes the design and analysis of health services interventions and their influence on health outcomes. Advantages and disadvantages of studies that use large databases, as well as advanced methods in analysis and interpretation of health services outcomes are addressed. This includes application of traditional research designs (e.g., randomized trials) to address health services research questions and the interface between health services research and health policy. Prerequisites: CRP-242 and CRP-245. Credit: 2.

**CRP-250. Genetic Analysis of Human Disease.** This is an introduction to quantitative methods associated with the analysis of human genetic data, with an emphasis on applied projects aimed at identifying genes leading to human disease. The course provides an overview of modern techniques in the analysis of complex human disease with a focus on statistical techniques. Topics include: how a trait is determined to have a genetic component; testing Hardy-Weinberg equilibrium, utilization of linkage maps; detection and location of genes using linkage disequilibrium and other methods; gene-environment interactions; and a molecular overview of DNA techniques and evolving methodologies (SNPs, microarray analysis, etc.). Students are introduced to specialized software and internet-based resources for the analysis of genetic data. Prerequisites: CRP-241 and CRP-243. Credit: 2.

**CRP-251. Questionnaire Design and Psychometrics.** An introduction is provided to the elements of psychometric theory that are relevant to the conduct of clinical research. Topics include issues in questionnaire and scale design, types of scales, scale construction and validation; definition, measures, and estimation of reliability and validity; statistical issues resulting from unreliability (such as

the effect of reliability on sample size estimation); and methods for assessing the psychometric properties of scales (such as factor analysis and Cronbach's alpha). Prerequisites: CRP-242 and CRP-245. Credit: 2.

**CRP-252. Principles of Clinical Pharmacology.** This course provides a basis for understanding the scientific principles of rational drug therapy and contemporary pharmaceutical development. Topics include evaluation of the physiologic and pathophysiologic factors involved in drug absorption, distribution, metabolism, and elimination. A major focus is on determinants that result in inter- and intrapatient variability in pharmacokinetics/pharmacodynamics. A variety of tests used in a surrogate fashion for evaluation of drug response are discussed. A practical guide to pharmacokinetic/pharmacodynamic data analysis provides an introduction to common modeling approaches. Prerequisites: CRP-242 and CRP-245. Credit: 2.

**CRP-253. Responsible Conduct of Research.** This course explores a variety of ethical and related issues that arise in the conduct of medical research. Topics include human subjects and medical research, informed consent, ethics of research design, confidentiality, diversity in medical research, international research, relationships with industry, publication and authorship, conflict of interest, scientific integrity and misconduct, intellectual property and technology transfer, and social and ethical implications of genetic technologies and research. Prerequisite: CRP-242. Credit: 2.

**CRP-254. Research Management.** Operational issues that arise in the conduct of a clinical research project are addressed. Topics include administration (human resources, project management, budget development and management), data management systems (databases, case report forms, data acquisition, quality assurance and quality control (QA/QC), monitoring and auditing), regulation (Investigational New Drug [IND]) applications, good clinical practice (GCP), and the Health Insurance Portability and Accountability Act (HIPAA), and sponsorship (sources, sponsor motivations, identifying sponsors). Prerequisite: CRP-242. Credit: 2.

**CRP-255. Genome Technologies.** This course provides an introduction to the laboratory and computational methodologies for genetic sequencing, mapping and expression measurement. Techniques from computer science are used to make biological inferences from DNA and protein sequences. Topics include an introduction to sequence analysis software (Fasta, Blast, Multiple alignment); techniques for gene identification (introns, alternative splicing, repetitive DNA, and polymorphism discovery and detection); phylogenetic tree identification of coding regions and how to build a linkage disequilibrium map. Approaches to navigate existing biological databases are presented. Prerequisite: CRP-243. Credit: 2.

**CRP-256. Statistical Analysis of Gene Expression Data.** This course focuses on concepts in the design and data analysis of gene expression (microarray and serial analysis of gene expression) experiments. Statistical concepts include issues that arise when there are many more variables than samples, sources of variation (systematic and random), replication, scope of inference, experimental design, data processing, multiple testing, and validation. Methods that address the general objectives of identifying class differences, class prediction, and class discovery are covered. Prerequisites: CRP-243 and CRP-245. Corequisite: CRP-255. Credit: 2.

**CRP-257. Introduction to Proteomics.** This course introduces the platform technologies and computational methodologies for protein profiling and interaction analysis. The platform technologies covered include mass spectroscopy, 2D gel electrophoresis, surface plasmon resonance, protein arrays and flow cytometry. Structural biology and high-throughput screening methods are also discussed. Prerequisite: CRP-243. Credit: 2.

**CRP-270. Research.** An individualized research project under the direction and supervision of the student's mentor and examining committee forms the basis for this culmination of the program of study leading to the degree of Master of Health Sciences in Clinical Research. Credit: 12.

# The Pathologists' Assistant Program

## MASTER OF HEALTH SCIENCES CURRICULUM

Professor and Chairman, Department of Pathology: Salvatore V. Pizzo, M.D., Ph.D.
Director, Pathologists' Assistant Program: Kenneth R. Broda, Ph.D.

Associate Director, Pathologists' Assistant Program: Pamela Vollmer, B.H.S.
Medical Director, Pathologists' Assistant Program: Marcia Gottfried, M.D.
Director, Surgical Pathology: Marcia Gottfried, M.D.
Director, Autopsy Pathology: Alan Proia, M.D., Ph.D.
Surgical Pathology Training Coordinator: Claudia M. Brady, M.H.S.
Director, Autopsy Service, Veterans Affairs Medical Center: David Howell, M.D., Ph.D.
Director of Surgical Pathology, Veterans Affairs Medical Center: Robin Vollmer, M.D.

**Program of Study.** This is a 24-month program beginning with the start of the medical school academic year in August of each year. It provides a broad, graduate level background in medical sciences in support of intensive training in anatomic pathology. With the background in anatomy, histology, physiology, and microbiology, the students learn pathology at the molecular level in the classroom and are trained and given experience in the microscopic and gross morphology of disease in close, one-on-one training with pathology department faculty. They learn dissection techniques and all technical aspects of anatomic pathology in summer rotations. The curriculum is designed to produce individuals who fill the gap between the pathologist on the autopsy and surgical pathology services and other technical personnel who work in the tissue processing laboratory.

**Accreditation.** The curriculum, faculty, facilities, and administration of the program are accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Graduates are qualified to sit for the American Society of Clinical Pathology Board of Registry examination.

**Degree Requirements.** Passage of 83 units of graduate credit is required for the MHS degree. An additional 10 credits are required to receive a certificate at the end of the program. There is a mandatory, comprehensive oral presentation reviewed by a panel of pathology department faculty and staff which all students must pass for successful completion of the program.

**Grading Policies.** The grading system is assigned as follows: *H* (Honors), *P* (Pass), *LP* (Low pass), *F* (Fail), and *I* (Incomplete). Rotations are accompanied by written critiques of performance. Failure in any course may result in dismissal from the program. Poor performance on any rotation, even if passed, may result in the student performing extra work. All incomplete grades automatically revert to *F* if work is not completed within one semester or one summer session following award of the grade.

**Attendance and Excused Absences.** Students are required to attend all lectures, laboratories, seminars, and clinical assignments. Absences are excused only for illness or personal emergency, and students must notify program faculty in advance of an expected absence. Absences of one to two days duration for professional purposes during the second year are allowed with the approval of the program director.

**Withdrawal**. If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

| | |
|---|---|
| Before classes begin: | Full amount |
| During first or second week: | 80% |
| During third to fifth week: | 60% |
| During sixth week: | 20% |
| After sixth week: | none |

Student fees are nonrefundable after classes begin.

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the Offices of the Registrar and Financial Aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure the student has fulfilled all responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date.

## Curriculum

### Year 1

**Fall**

| | |
|---|---|
| INTERDIS-100B Molecules and Cells | 6 credits |
| CBI-301 Human Structure and Function1 | 2 credits |
| PATHASST-202 Introduction to Neuroanatomy and Neurohistology | 2 credits |
| | **20 credits** |

### Year 1

**Spring**

| | |
|---|---|
| INTERDIS-102B Body and Disease | 16 credits |
| PATHASST-204Introduction to Practical Pathology Techniques | 1 credit |
| PATHASST-206 Introduction to Neurologic Dissection | 1 credit |
| | **18 credits** |

### Year 1

**Summer**

| | |
|---|---|
| PATHASST-210 Introduction to Autopsy Pathology | 4 credits |
| PATHASST-220 Introduction to Surgical Pathology | 4 credits |
| PATHASST-215 Histology Techniques I | 1 credit |
| | **9 credits** |

### Year 2

**Fall**

| | |
|---|---|
| PATHOL-241P Pathologic Basis of Clinical Medicine I | 3 credits |
| PATHOL-223P Autopsy Pathology I | 4 credits |
| PATHASST-230 Surgical Pathology I | 8 credits |
| PATHOL-359P Diagnostic Technologies and Techniques | 2 credits |
| PATHASST-216 Histology Techniques II | 1 credit |
| PATHASST-240 Photography I | 1 credit |
| | **19 credits** |

### Year 2

**Spring**

| | |
|---|---|
| PATHOL-242P Pathologic Basis of Clinical Medicine II | 3 credits |
| PATHASST-231 Surgical Pathology II | 8 credits |
| PATHOL-224P Autopsy Pathology II | 4 credits |
| PATHASST-241 Photography II | 2 credits |
| | **17 credits** |

### Year 2

**Summer (Required for Program Certification)**

| | |
|---|---|
| PATHASST-300 Autopsy Practicum | 4 credits |
| PATHASST-301 Surgical Pathology Practicum | 4 credits |
| PATHASST-302 Forensic Pathology | 2 credits |
| | **10 credits** |

## Prerequisites for Admission

A baccalaureate degree in a biological or chemical science from an accredited institution which includes course work in general chemistry, organic chemistry and/or biochemistry, biologic science, microbiology, mathematics and English composition.

A baccalaureate degree in a non-science major, to include the courses defined above in 1, and at least 18 credit hours in biological and chemical sciences of such depth that the admissions committee judges the candidate has minimum scientific background to successfully begin the study of medical sciences.

Scores for the Graduate Record Examination (GRE) or Medical College Admission Test (MCAT) taken within the last five years.

Candidates who receive their baccalaureate degrees from institutions outside the United States must submit a transcript evaluation showing degree equivalency and subject matter description.

**Application Procedures.** Application materials are mailed to prospective candidates for admission up to January 31st of the year of expected matriculation. Applications can be obtained by writing to: Pamela Vollmer, BHS, PA(ASCP), Associate Director, Pathologists' Assistant Program, Department of Pathology, Box 3712, Duke University Medical Center, Durham, NC 27710, (919) 684-2159. Application forms may also be downloaded from our website: *pathology.mc.duke.edu.* All applications must be received by February 28.

Applications must include:

1. A completed application form and a non-refundable application fee of $55;
2. Official transcripts of all colleges and universities attended;
3. GRE or MCAT scores;
4. TOEFL or IELTS scores;
5. Three letters of recommendation.

Candidates will be notified of the Admission Committee's decision no later than April 30. Accepted candidates are required to submit a non-refundable deposit of $350 to retain their places in the class. This deposit will apply to tuition.

**Tuition, Fees, and Estimated Costs for Year One, 2006-2007**

| | |
|---|---|
| Tuition | $21,000 |
| Technology fee | 2,200 |
| Recreation fee | 60 |
| Books | 687 |
| Student health fee | 786 |
| Student insurance (single) | 1,589 |
| Vehicle registration | 600 |
| Rent, food, and miscellaneous | 20,400 |
| **Total** | **47,322** |

Financial aid information is available for all interested applicants by contacting the Office of Financial Aid, Box 3067, Duke University Medical Center, Durham, NC 27710, or at the School of Medicine's Office of Financial Aid website: *http:// finaid.mc.duke.edu.*

# Courses of Instruction

**INTERDIS 100B - Molecules and Cells.** A course designed for first year medical students with a focus on the molecular and cellular principles of human disease. The course has four components, which are tightly integrated: biochemistry, cell biology, genetics, and a series of clinical correlations. The biochemistry component re-emphasizes the relationship between structure and function of the major classes of macromolecules in living systems including proteins, carbohydrates, lipids, and nucleic acids. The metabolic interrelationships and control mechanisms are discussed as well as the biochemical basis of human diseases. The cell biology component emphasizes the structure and function of the cells and tissues of the body. The laboratory provides practical experience with light microscopy studying and analyzing the extensive slide collection of mammalian tissues. The genetics component emphasizes molecular aspects of the human genome, the structure of complex genes, regulation of gene expression, experimental systems for genetic analysis, human genetics -- including population genetics and genetic epidemiology, the use of genetic analysis for the identification of disease causing genes,

cytogenetics, cancer genetics, and genetic diagnosis and counseling. The series of clinical correlations links the material covered in the basic science lectures to clinical problems. Many of the correlations include an interview with a patient. Also included are a day symposium on nutrition and a day symposium on aging. Credit: 6. *Garcia-Blanco, Nicchitta, Raetz, and staff*

**CBI 301 - Human Structure and Function.** Core course of preclinical curriculum presents scientific principles underlying structure and function of the normal body. Focuses on gross anatomy, microscopic anatomy, and physiology of nine organ systems providing the foundation for the practice of medicine. Registration of non-Pathologists' Assistant students requires permission of Course Director. Credit: 12. *Jakoi*

**INTERDIS 102B - Body and Disease.** This core course is presented from February through June of the first year. The course begins with fundamental principles of the four basic sciences most directly related to human disease: immunology, microbiology, pathology and pharmacology. This component is followed by an integrated presentation of the most common human diseases organized sequentially by organ system. Teaching modes include lectures, a variety of small group activities guided by faculty and clinically-oriented disease workshops. Credit: 16. *Nadler, Dawson, Hulette, and Mitchell.*

**PATHOL-223P, 224P - Autopsy Pathology I, II.** A detailed consideration of the morphologic, physiologic, and biochemical manifestations of disease. Includes gross dissection, histologic examinations, processing, and analyzing of all autopsy findings under tutorial supervision. Credit: 4, 4. *DiBarnado and staff*

**PATHOL-241P, 242P - Pathologic Basis of Clinical Medicine I, II.** This course consists of lectures and seminars by the departments of Pathology and Medicine faculty emphasizing both basic science and systemic pathologic topics. Credit: 3, 3. Department of Pathology and Medicine faculty.

**PATHOL-359P - Diagnostic Technologies and Techniques.** Medical technologies and techniques used to assess Cellular and Subcellular Pathology are presented. The course consists of lectures and demonstrations on special techniques and technologies used to study the alterations of cellular structure and associated functions that accompany cell injury e.g. electron microscopy, fine needle aspiration and bone marrow aspiration biopsy etc. Credit: 2. *Shelburne and staff*

**PATHASST-202 – Introduction to Neuroanatomy and Neurohistology.** This is an intensive course in the study of neuroanatomy and neurohistology. The purpose of this course is to teach students the gross and microscopic anatomy of the brain and spinal cord. Credit: 2. *Hulette and Hennessey*

**PATHASST-204 – Introduction to Practical Pathology Techniques.** This course is designed to introduce the student to the day-to-day activities in a surgical pathology and an autopsy service. Emphasis is placed on the various duties assumed by trained Pathologists' Assistants. Students are introduced to basic tissue dissection techniques taught through participation in autopsies. Credit: 1. *Hennessey*

**PATHASST-206 - Introduction to Neurologic Dissection**. The purpose of the course is to teach students how to dissect the brain and spinal cord, and take sections for microscopic diagnostic purposes. Credit: 1. *Hulette and Hennessey*

**PATHASST-210 - Introduction to Autopsy Pathology.** This is a summer rotation given during the first summer session. It is designed to acquaint the student with autopsy prosection and workup. Students assist residents in full autopsy dissections. Credit: 4. *D iBarnado and staff*

**PATHASST-215, 216 - Histology Techniques I, II.** Students participate in rotations through various histology laboratories. The rotations are designed to acquaint students with the various laboratory techniques used in tissue processing and special procedures. Credit: 1, 1. *Dotson and staff*

**PATHASST-220 - Introduction to Surgical Pathology.** This is a rotation conducted during the first summer session. It is designed to acquaint students with the techniques of gross dissection, descriptions, and submission of tissue samples from surgical specimens. Credit: 4. *Brady and staff*

**PATHASST-230, 231 - Surgical Pathology I, II.** These courses consist of thorough laboratory training in the orientation, description, and dissection of gross surgical specimens. Students follow many of the cases through to signout by the pathologist. Credit:8, 8. *Brady and staff*

**PATHASST-240, 241 – Photography I, II.** This is an introduction to medical photography. Students become familiar with photography equipment and the fundamentals of gross specimen photography. Credit: 1, 2. *Reeves and Conlon*

**PATHASST-300 - Autopsy Practicum.** This is the final autopsy rotation completed during the summer of the second year of training. Students must perfect their dissection skills, demonstrate the ability to conduct full autopsy prosections in all possible situations, and write full preliminary autopsy reports. In addition, special dissection skills are taught in this course. Credit: 4. *DiBarnado and staff*

**PATHASST-301 - Surgical Pathology Practicum.** This is the final surgical pathology rotation completed during the summer of the second year of training. Students must perfect their dissection skills and demonstrate the ability to orient, dissect, describe, and submit appropriate tissue samples from all commonly encountered surgical pathology specimens. Credit: 4. Brady *and staff*

**PATHASST-302 – Forensic Pathology.** This is a practical rotation at the North Carolina Office of the Chief Medical Examiner observing and participating (on a limited basis) with forensic pathologists performing medical-legal autopsies. Credit: 2. *Butts and staff*

### Pathologists' Assistant Program
### (Master of Health Sciences and Certificate)

| | | | |
|---|---|---|---|
| **1st year** | **Fall 2006** | 08/07/06 | 01/26/07 |
| | **Spring 2007** | 02/05/07 | 06/29/07 |
| | **Summer 2007** | 07/09/07 | 08/31/07 |
| **2nd year** | **Fall 2006** | 09/05/06 | 12/15/06 |
| | **Spring 2007** | 01/02/07 | 05/11/07 |
| | **Summer 2007** | 05/14/07 | 07/19/07 |

Students enrolled in the Pathologists' Assistant Program are required to complete a minimum of 93 credits – *pending approval and subject to change.*

# The Physician Assistant Program

## MASTER OF HEALTH SCIENCES CURRICULUM

### Department of Community and Family Medicine

Department Chairman: J. Lloyd Michener, M.D.
PA Division Chief: Justine Strand, M.P.H., PA-C
Program Director: Patricia M. Dieter, M.P.A., PA-C
Medical Director: Joyce A. Copeland, M.D.
Associate Director: Karen J. Hills, M.S., PA-C
Academic Coordinator: Thomas P. Colletti, M.P.A.S., PA-C
Academic Coordinator: David M. Coniglio, M.P.A., PA-C
Clinical Coordinator: Elizabeth P. Rothschild, M.M.Sc., PA-C
Clinical Coordinator: Valerie J. Schaffer, MHS, PA-C
Assistant Clinical Professor: Peggy R. Robinson, M.S., M.H.S., PA-C
Director of Recruitment and Minority Affairs: Lovest T. Alexander, M.H.S., PA-C
Director of Research: Perri Morgan, MS, PA-C
Surgical Coordinator: Paul C. Hendrix, M.H.S., PA-C
Behavioral Medicine Coordinator: Victoria Scott, M.H.S., PA-C
Evidence-Based Medicine II Coordinator: Prema R. Menezes, M.H.S., PA-C
PA Teaching Fellow: Sherrie Spear, M.H.S.,PA-C

The physician assistant (PA) concept originated at Duke 40 years ago. Dr. Eugene A. Stead Jr., then chairman of the Department of Medicine, believed that mid-level practitioners could increase consumer access to health services by extending the time and skills of the physician. Today, physician assistants are well-recognized and highly sought-after members of the health care team. Working interdependently with physicians, PAs provide diagnostic and therapeutic patient care in virtually all medical specialties and settings. They take patient histories, perform physical examinations, order laboratory and diagnostic studies, and develop patient treatment plans. In most states, including North Carolina, PAs have the authority to write prescriptions. Their job descriptions are as diverse as those of their supervising physicians, and also may include patient education, medical education, health administration, and research.

PAs practice in all specialty fields; about 40 percent of all PAs provide primary care services, especially in family and general internal medicine. While PAs remain dependent in that they provide

medical services with the supervision of physicians, other non-physician tasks have been integrated into the role, particularly in the institutional and larger clinic setting. While not always clinical in nature, these tasks are essential to the practice of the PA's supervising physician. For example, PAs in the tertiary care setting are often involved in the acquisition, recording and analysis of research data, the development of patient and public education programs, and the administration of their departments' clinical and educational services. Involvement in these other services has provided job advancement for PAs in these settings.

Additional non-clinical positions are developing for PAs. While these positions do not involve patient care, they depend on a strong clinical knowledge base. The M.H.S. curriculum provides PAs with depth of knowledge in the basic medical sciences and clinical medicine, as well as skills in administration and research. With these expanded skills, graduates can take advantage of the wide diversity of positions available to PAs.

**Program of Study.** The curriculum is 24 consecutive months in duration and is designed to provide an understanding of the rationale for skills used in patient assessment, diagnosis, and management. The first 12 months of the program are devoted to preclinical studies in the basic medical and behavioral sciences, and the remaining 12 months to clinical experiences in primary care, medical and surgical specialties, and advanced study in evidence-based medicine.

Each student is assessed a technology fee for both the first and second years. As part of the technology fee, the program provides computers and PDAs which are used for a variety of in-class and clinical assignments and activities, as well as communication.

The preclinical curriculum is integrated to introduce the student to medical sciences as they relate to specific organ systems and clinical problems. Learning strategies include the traditional lecture format and basic science laboratory, small group tutorials, and patient case discussions. Regular patient contact is an important part of the first year curriculum. Students begin to see patients during the spring semester as part of the Patient Assessment course; this patient contact continues throughout the summer term of the preclinical year.

As part of the clinical practicum, students are required to take rotations in internal medicine, surgery, emergency medicine, primary care, pediatrics, obstetrics/gynecology, and behavioral medicine. In addition, two elective clinical rotations are included in the clinical year schedule, as is a four-week period devoted to advanced study in Evidence-Based Medicine. At least two clinical rotations must be completed in a medically underserved site. The final weeks of the clinical year are spent in a senior seminar which includes intensive preparation for the PA National Certifying Examination (PANCE).

Because the clinical teaching is carried out in many practice settings throughout North Carolina, students should plan on being able to travel away from the Durham area for many of their clinical experiences. Housing will be made available for out-of-town clinical rotations.

**Curriculum.** Before proceeding into the clinical phase of the curriculum, students must satisfactorily complete the following:

### Preclinical Year

#### Fall Semester

| | |
|---|---|
| PHYASST-200. Basic Medical Sciences | 5 credits |
| PHYASST-205. Anatomy | 4 credits |
| PHYASST-210. Diagnostic Methods I | 2 credits |
| PHYASST-215. History and Physical Diagnosis | 3 credits |
| PHYASST-220. Clinical Medicine I | 4 credits |
| PHYASST-251 Practice and the Health System I | 2 credits |
| **Total** | **20 credits** |

#### Spring Semester

| | |
|---|---|
| PHYASST-211. Diagnostic Methods II | 2 credits |
| PHYASST-221. Clinical Medicine II | 9 credits |

| | |
|---|---|
| PHYASST-230. Fundamentals of Surgery and Emergency Medicine | 5 credits |
| PHYASST-235. Patient Assessment I | 2 credits |
| PHYASST-240. Behavioral Aspects of Medicine | 2 credits |
| **Total** | **20 credits** |

### Summer Term

| | |
|---|---|
| PHYASST-212. Diagnostic Methods III | 2 credit |
| PHYASST-222. Clinical Medicine III | 7 credits |
| PHYASST-236. Patient Assessment II | 1 credit |
| PHYASST-252. Practice and the Health System II | 2 credits |
| PHYASST-255. Evidence-Based Medicine I | 3 credits |
| **Total** | **15 credits** |

### Clinical Year

Following successful completion of the preclinical courses, students enter the clinical phase of the program, completing the following experiences:

| | |
|---|---|
| PHYASST-300. Primary Care | 8 credits |
| PHYASST-305. Evidence-Based Medicine II | 3 credits |
| PHYASST-310. Behavioral Medicine | 4 credits |
| PHYASST-320. Internal Medicine | 8 credits |
| PHYASST-340. General Surgery | 4 credits |
| PHYASST-350. Emergency Medicine | 4 credits |
| PHYASST-360. Pediatrics | 4 credits |
| PHYASST-370. Obstetrics/Gynecology | 4 credits |
| Elective | 4 credits |
| Elective | 4 credits |
| PHYASST-390. Senior Seminar | 2 credits |
| **Total** | **49 credits** |

The student receives four credits for rotations which are four weeks in length, and eight credits for rotations which are eight weeks in length.

In addition to successful completion of the preclinical and clinical phases of the program, the PA student must also successfully complete BLS, ACLS, and all components of summative evaluation.

**Program Policies and Grading Standards.** Grades for all courses and clinical rotations in the Physician Assistant curriculum are assigned on the basis of the following: Honors (*H*), Pass (*P*), and Fail (*F).* The Physician Assistant Program is designed to integrate classroom and clinical learning experiences considered necessary for competency as health care providers. Therefore, the failure of any required course will result in dismissal from the program. Determination of satisfactory academic progress is made by the PA program director upon advisement by the progress and promotions committee, at the conclusion of each semester/term.

A grade of "Incomplete" (*I*) may remain on a student's transcript for one year only. After one year, a grade of "Incomplete" automatically is converted to an *F* (Fail). An extension to this one-year limit may be granted by the program director; a request must be submitted in writing to the program director no later than 30 days prior to the expiration of the one-year time limit.

Students in the Physician Assistant Program are participants in a professional training program whose graduates assume positions of high responsibility as providers of health care. Accordingly, students are evaluated not only on their academic and clinical skills, but also on their interpersonal skills, reliability, appearance, and professional conduct. Deficiencies in any of these areas are brought to the student's attention in the form of a written evaluation and may result in probation, suspension, or expulsion from the program.

**Appeals of Academic Status (Academic Probation or Withdrawal).** A student placed on academic probation or withdrawn from the program may appeal by indicating in writing by registered mail to the program director (a) reasons why he/she did not achieve minimum academic standards, and (b) factual evidence for changing the academic standing. Appeals will be considered individually on their merits and will not be considered as precedent. The program director will notify the student of the decision on the appeal in writing within three weeks of receipt of the appeal.

**Appeals of Course Grades.** A student may appeal a course grade by writing to the program director, providing factual evidence for changing the final course grade. Appeals will be considered individually on their merits and will not be considered as precedent. The program director will notify the student of the decision on the appeal in writing, within two weeks of receipt of the appeal.

**Satisfactory Academic Progress.** Satisfactory academic progress for students in the Physician Assistant Program consists of the successful completion of all requirements necessary for the advancement from one semester to the next. These requirements are as follows:

*Preclinical Year:* Completion of all required courses (a total of 55 credits) during the fall, spring, and summer terms within the scheduled semester or term and within one year of initial matriculation.

*Clinical Year:* Completion of all required core rotations, elective rotations, and a senior seminar (a total of 49 credits) during the fall, spring, and summer terms; rotations begin in the semester immediately following the completion of the preclinical year and must proceed as scheduled without interruption for three semesters/terms (12 months).

In unusual circumstances (including illness, academic remediation, or irregular sequencing of courses) the determination of satisfactory progress for academic purposes is made by the program director of the Physician Assistant Program.

For financial aid purposes, federal regulations establish the maximum time frame for completion of the program at 150 percent of the minimum time required to complete the program. Any student exceeding the 150 percent maximum time frame is ineligible for Title IV (Stafford and Perkins loans) student financial aid funds.

**Attendance and Excused Absences.** Students are required to attend all lectures, laboratories, seminars, and clinical assignments. Absences are excused only for illness or personal emergency, and students must notify program faculty in advance of an expected absence.

**Leave of Absence.** A PA student, after presenting a written request to the PA program director, may be granted an official leave of absence for personal, medical, or academic reasons for a period not to exceed one calendar year. If the leave of absence is approved, the program director provides written notification including applicable beginning and ending dates to the student, the medical school registrar, and the director of financial aid. The student must notify the program director in writing of his or her wish to return to the PA Program or to extend the personal leave at least 60 calendar days prior to the anticipated date of reentry. The student desiring an extension beyond one calendar year may be required to apply for readmission to the PA Program. When a leave of absence is taken, the program director may require the student to repeat some or all of the courses completed prior to the leave of absence. In all cases of leave of absence, the student is required to complete the full curriculum to be eligible to earn the PA certificate.

For purposes of deferring repayment of student loans during a school-approved leave of absence, federal regulations limit the leave to six months.

**Withdrawal**. If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

| | |
|---|---|
| Before classes begin: | Full amount |
| During first or second week: | 80% |
| During third to fifth week: | 60% |
| During sixth week: | 20% |
| After sixth week: | none |

Student fees are nonrefundable after classes begin.

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and

any academic penalty to be assessed. Per letter, the program director will notify the Offices of the Registrar and Financial Aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure that they have fulfilled any responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date.

**Prerequisites for Application.** The prerequisites for application to the M.H.S. physician assistant curriculum include:

1. A baccalaureate degree from an accredited institution. College seniors are eligible to apply, provided they receive the baccalaureate degree prior to the August starting date for the PA Program. Those candidates who received their baccalaureate degrees from colleges and institutions outside of the United States must complete at least one year (30 semester credits) of additional undergraduate or graduate study at a U.S. college or university prior to application to the program.
2. Specific prerequisite college courses:
   - At least five biological science courses of three semester credits or four quarter credits each are REQUIRED. Of these five courses, at least one must be in anatomy, one in physiology, and one in microbiology. Courses in human anatomy and human physiology are preferred to courses of a more general nature, and courses with labs are preferred. To fulfill the remaining biological science course prerequisite, the PA Program recommends courses in cell biology, molecular biology, genetics, embryology, histology, or immunology. While none of the latter courses are required, they provide a good foundation for the study of medicine.
   - At least two chemistry courses with labs are REQUIRED. Each of these courses must be at least four semester credits or five quarter credits each.
   - At least one statistics course of at least two semester credits or three quarter credits is REQUIRED.
   - All prerequisite courses must be completed with grades of *C* or better (not *C* minus).
3. Scores of the Graduate Record Examination (GRE general test), taken within the last four years, and no later than October 1 of the year of application. No other test scores are accepted in lieu of the GRE
4. A minimum of 1,000 hours of patient care experience, with direct "hands-on" patient contact, completed by October 1 of the year of application.

**Application Procedures**. Duke's PA Program is a participant in CASPA (Centralized Application Service for PAs). The CASPA application may be accessed via the program's website *http://pa.mc.duke.edu*. The application is available from May 1 – October 1. In addition to completing and submitting the web-based application by October 1, candidates must also submit:

- the CASPA application fee
- official transcripts from all colleges/universities and other post-secondary institutions attended;
- scores of the (GRE). The GRE must be taken no later than October 1;
- three completed recommendation forms, including at least one from a health care provider with whom the applicant has worked;
- the on-line supplemental application (access provided to the applicant after submission of CASPA application)

**Selection Factors.** The program has a specific interest in enrolling students from diverse social, ethnic, and educational backgrounds. Emphasis is placed upon personal maturity, quality of health care experience, dedication to the health field, and academic potential. Information submitted by each applicant is carefully reviewed by the Committee on Admissions, and selected applicants are invited to Duke University for personal interviews. These interviews take place in December, January and February; 50 students are chosen from among those interviewed. Only full-time students are admitted.

Candidates are notified of the Admission Committee's decision as soon as possible after the interview, and no later than March 1. Those candidates who have been accepted are asked to respond

in writing with their decision and to confirm their place in the class by submitting the non-refundable registration and deposit fees by the requested date. Each year, a ranked alternate list of 10-15 candidates is selected from those candidates who have been interviewed for a position in the class. Should an accepted candidate withdraw from the program prior to the start of classes, the position is offered to the highest ranked candidate on the alternate list.

[*] **Tuition and Fees.** On notification of acceptance, prospective PA students are required to pay a non-refundable first registration fee of $75, as well as a non-refundable program deposit of $475. For those who do matriculate, the program deposit is applied to the cost of tuition.

Estimated yearly expenses[†] for the 2006 entering class of the Master of Health Sciences Physician Assistant Program are as follows:

| | |
|---|---|
| Tuition, First (Preclinical) year | $26,245 |
| Tuition, Second (Clinical) year | 26,245 |
| Books, uniforms, and instruments, first year | 1,980 |
| Books, uniforms, and instruments, second year | 690 |
| Technology Fee, First (Preclinical) year | 1,750 |
| Technology Fee, Second (Clinical) year | 1,750 |
| Other fees | 212 |
| Food, board, and miscellaneous | 1,000 |
| Student Health Fee | 786 |
| Student Accident and Hospitalization Insurance per year (single) | 53,962 |
| Total, Second year | 54,037 |

**Health Insurance.** All students are required to carry full major medical health insurance throughout their enrollment in the PA program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The Student Health Fee is mandatory for all students.

**Financial Aid.** All financial aid awards are made on the basis of documented financial need. Most Duke PA students finance their education through student loans up to the cost of the school-approved budget, by qualifying for student federal, state, private, and PA tuition loans.

Qualified students may be eligible for subsidized Federal Stafford Loans up to $8,500, unsubsidized Federal Stafford loans up to $10,000, and alternative private loans up to the cost of education. The Federal Stafford Loans interest rate is dependent on the 91-day Treasury bill, but Stafford loan interest rate cannot exceed 8.25%. Alternative, private lenders will have varying rates based on prime rate, the T-bill rate, or LIBOR. The financial aid office participates in the Duke University School as Lender program. Information about this program will be included on the award notification. The final decision, however, is left solely to the student applicant.

The North Carolina Student Loan Program for Health, Science, and Mathematics provides financial assistance in the form of loans up to $6,500 per year for North Carolina residents; these loans may be cancelled through approved service in shortage areas, public institutions, or private practice. Applicants may call (919) 549-8614 for further information about this loan program. Additional loans are available from private or alternative lenders. On occasion, there are additional federal loans available.

The U.S. Public Health Service has several programs that offer scholarships, stipends, and loan repayment to PA students who commit to varying periods of employment within designated

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[*] Subject to change and Board approval

[†] Includes Stead Society dues $60, Recreation $60, Parking $72, Graduate Activity $20

facilities. Interested applicants can call the National Health Service Corps Program directly at 1-800-221-9393 or go to *http://nhsc.bhpr.hrsa.gov/* for further information. Limited scholarship funds are available through the Duke Physician Assistant Program. The Physician Assistant Scholarship Committee will review each applicant and make decisions in the Spring prior to matriculation. This scholarship will reduce the amount a student borrows. All financial aid awards are made on the basis of documented financial need. Financial aid application packets are distributed on the admissions interview date. The application process includes a Duke application, completion of the Free Application for Federal Student Aid (FAFSA), and submission of the applicant's most recent tax return.

Once all of these have been received, a review will be made and an award notification is mailed to the student. It is extremely important that instructions on the award notification are followed in order to apply for loans in a timely manner and to have funds available at the beginning of the academic year.

Applicants are urged to request information and application forms from clubs, organizations, foundations, and agencies as soon as possible after applying for admission to the program. Many libraries have information on sources of financial aid. Also, the financial aid offices at nearby colleges and universities often have information on sources of funding. Applicants are strongly urged to use web search engines in locating scholarships. At no time, however, should an applicant pay a person or company to search for scholarships. Scholarship information is available free to applicants by using their local and web resources.

Some first-year students are employed part-time; however, the rigor of the academic curriculum usually prevents the student from maintaining part-time employment. Students who wish to be employed during their training must comply with the program's academic schedule and are prohibited from working more than 20 hours per week. Part-time employment must never interfere with class or clinical schedules. Any student unable to maintain adequate academic standing will be required to terminate his/her employment. Because of the demands of the clinical year, it is difficult or impossible for the second year student to work.

More detailed information regarding financial aid can be obtained from the Office of Financial Aid, Box 3067, Duke University Medical Center, Durham, NC 27710 (*http://financialaid.mc.duke.edu)* or by emailing *financial_aid@mc.duke.edu.*

**Criminal Background Check.** Candidates offered admission to the Physician Assistant Program will undergo criminal background checks.

**Commencement.** To receive the M.H.S. degree at the May commencement ceremony, the physician assistant student must successfully complete 90 credits including all preclinical courses, Evidence-Based Medicine II (PHYASST 305), and all clinical rotations scheduled to that date. The PA program certificate of completion is awarded four months later.

# Courses of Instruction

Course credits are the recognized units for academic work in the PA Program. **All courses are required, no transfer credit accepted, and no credit is granted for past experiential learning.**

## Preclinical Year Courses

**PHYASST-200. Basic Medical Sciences.** The basic facts, concepts, and principles which are essential in understanding the fundamental mechanisms of human physiology, immunology, and pharmacology. This course presents the basic methods of clinical problem solving and serves as a prerequisite to the clinical medicine course by emphasizing the underlying principles of the etiology, management, and prevention of disease processes. Credit 5. *Colletti, Coniglio*

**PHYASST-205. Anatomy.** Functional and applied anatomy stressing normal surface landmarks and common clinical findings. Topics for this course are sequenced with physical diagnosis (PHYASST-215). Cadaver prosections, anatomic models, lectures, and computer software are utilized in teaching this course. Credit: 4. *Hendrix*

**PHYASST-210, 211, 212. Diagnostic Methods I, II, III.** The essentials of ordering, interpreting, and performing diagnostic studies used in the screening, diagnosis, management, and monitoring of common diseases. Topics for this course are sequenced with Clinical Medicine (Phys Asst 220, 221,

222). Lectures, small group discussions, and hands-on laboratory sessions are the teaching strategies utilized in this course. Credit: 2; 2; 2. *Spear*

**PHYASST-215. History and Physical Diagnosis.** An introduction to history-taking and to the techniques for performing and recording the physical examination. Taught in lecture and small-group format; audiovisuals are used, as well as extensive small group practice sessions. Credit: 3. *Hills*

**PHYASST-220, 221, 222. Clinical Medicine I, II, III.** The essentials of diagnosis and management of the most common clinical problems seen by primary care practitioners. Using an organ systems approach, clinical information is presented in conjunction with appropriate correlative lectures and labs in pathophysiology, pharmacotherapeutics, radiology, and nutrition. Patient simulations are used in the small group setting to enhance readings and lectures. This is a core course around which most other courses are organized. Credit: 4; 9; 7. *Colletti, Coniglio, Morgan, Robinson, and Spear*

**PHYASST-230. Fundamentals of Surgery and Emergency Medicine.** The course focuses on the basic surgical concepts needed for the PA to function in primary care settings as well as major surgical areas. The course emphasizes surgical concepts, topics and surgical technique. A substantial part of this course consists of essential hands-on laboratory exercises emphasizing surgical skills in a primary care setting. Credit: 5. *Hendrix.*

**PHYASST-235, 236. Patient Assessment.** An Introduction to the practical application of history-taking and physical examination skills, and the recording and presentation of clinical information. Teaching methods include weekly small group meetings and weekly clinical assignments to examine and/or interview patients in hospital, outpatient, and long-term care setting. Credit: 2; 1. *Coniglio*

**PHYASST-240. Behavioral Aspects of Medicine.** An introduction to the skills, knowledge, and sensitivity needed to communicate and intervene effectively in a wide variety of psychosocial situations. Credit: 2. *Scott*

**PHYASST- 251, 252. Practice and the Health System I,II.** An introduction to the structure and administrative principles in use in health care organizations, and professional issues review. A lecture series taught by an interdisciplinary faculty and by community experts in health care organization. Topics include the patient as consumer, third-party payment, public policy trends, organizational behavior, legal and ethical problems, and the unique place of PAs in the health care system. Credit: 2; 2. *Strand, Dieter*

**PHYASST 255. Evidence-Based Medicine I.** A lecture and seminar course that provides a practical approach to making sound medical decisions on the basis of current evidence in the medical literature. Through a series of didactic presentations, group exercises, and reading, students will learn the basic principles of evidence-based medicine. Basic skills in using MEDLINE and other medical databases will be emphasized and practiced. Research principles, research ethics, and basic statistical review are introduced. Credit: 3. *Coniglio, Morgan*

## Clinical Year Courses - Required

## COMMUNITY AND FAMILY MEDICINE

**PHYASST 300. Primary Care.** This eight-week rotation emphasizes the outpatient evaluation and treatment of conditions common at the primary care level and the appropriate health maintenance measures for different age groups. Many of the training sites provide care for underserved populations in rural North Carolina communities. Credit: 8. *Staff*

**PHYASST 305. Evidence-Based Medicine II.** During this month-long course during the clinical year, PA students complete an evidence-based review paper on a clinical question of interest. They present their findings to faculty and student colleagues. Credit: 3. *Coniglio*

**PHYASST-310. Behavioral Medicine.** For this four-week rotation, the student is assigned to a psychiatric and/or behavioral clinical setting, either inpatient or outpatient. This rotation facilitates the acquisition of communication and behavioral modification skills which are useful in the primary care setting. Credit: 4. *Staff*

**PHYASST-390. Senior Seminar**. In small group and lecture settings, students review clinical cases and common medical topics and procedures. A final written summative evaluation is part of this course, which also serves as preparation for the PA National Certifying Examination (PANCE). Credit: 2. *Dieter*

## MEDICINE

**PHYASST-320. Internal Medicine.** During this eight-week rotation, the student learns to apply basic medical knowledge to the problems and situations encountered on an internal medicine service. By collecting a data base, formulating a complete problem list, and participating in daily rounds and in the management of patient problems, the student develops an awareness of the complexity of disease processes and differential diagnosis. Credit: 8. *Staff*

## OBSTETRICS/GYNECOLOGY

**PHYASST-370. Obstetrics/Gynecology.** During this four-week rotation, the student learns about common gynecological problems, pregnancy, and delivery. Assisting at surgery may be a part of the rotation. The rotation emphasizes routine gynecological and prenatal care, clinical experience with cancer detection techniques, abnormal menstruation and bleeding, infections, and contraception counseling. Credit: 4. *Staff*

## PEDIATRICS

**PHYASST-360. Pediatrics.** In this four-week rotation, the student is assigned to either an institutional setting or a community-based pediatric site. Special emphasis is placed on communication skills and relating sensitively to both children and parents. The student gains familiarity with normal growth and development, pediatric preventive medicine, and evaluation and management of common childhood illnesses. Credit: 4. *Staff*

## SURGERY

**PHYASST-340. General Surgery.** This four-week rotation emphasizes preoperative evaluation and preparatory procedures, assisting at the operating table, and management of patients through the postoperative period to discharge. Credit: 4. *Staff*

**PHYASST-350. Emergency Medicine.** This four-week rotation emphasizes the evaluation and management of both medical and surgical problems of the ambulatory patient. Students gain experience in the initial evaluation of emergency room patients, perform problem-specific exams, and practice minor surgery skills. Credit: 4. *Staff*

## Clinical Year Courses – Elective

In addition to the above required core rotations, each student is required to complete two electives that can be chosen from among the following rotations. All are four weeks long. Each of these electives is 4 Credit. *Staff*

## COMMUNITY AND FAMILY MEDICINE

**PHYASST-301. Occupational Medicine.** This rotation offers experiences in occupational medicine assessment and problem management. Credit: 4. *Staff*

**PHYASST-302. Geriatrics.** This rotation emphasizes the evaluation and management of geriatric patients in a long-term care or hospital setting. Credit: 4. *Staff*

## GENERAL ELECTIVES

**PHYASST-300E Primary Care**. This rotation emphasizes the outpatient evaluation and treatment of conditions common at the primary care level and the appropriate health maintenance measures for different age groups. Credit: 4. *Staff*

**PHYASST-310E Behavioral Medicine**. This rotation provides additional emphasis on communication and behavioral modification skills, which are useful in the primary care setting. Credit: 4. *Staff*

**PHYASST-320E Internal Medicine**. This rotation provides the student with an opportunity to apply basic medical knowledge to the problems and situations encountered in an internal medicine setting. Credit: 4. *Staff*

**PHYASST-340E General Surgery**. This rotation emphasizes preoperative evaluation and preparatory procedures, assisting at the operating table, and management of patients through the postoperative period to discharge. Credit: 4. *Staff*

**PHYASST-350E Emergency Medicine**. This rotation provides opportunity for students to increase their knowledge of the triage and management of medical emergencies. Credit: 4. *Staff*

**PHYASST-360E Pediatrics**. The rotation provides familiarity with normal growth and development, pediatric preventive medicine, and evaluation and management of common childhood illnesses. Credit: 4. *Staff*

**PHYASST-370E Obstetrics/Gynecology**. This rotation provides students with the opportunity to learn about common gynecological problems, pregnancy, and delivery. Credit: 4. *Staff*

**OBSTETRICS/GYNECOLOGY**

**PHYASST-371 Maternal/Fetal Medicine**. This rotation emphasizes prenatal and postpartum care. Credit: 4. *Staff*

## MEDICINE

**PHYASST-321. Cardiology** This rotation offers experiences in cardiovascular assessment and problem management. Credit: 4. *Staff*

**PHYASST-322. Dermatology**. This rotation offers experiences in dermatological assessment and problem management. Credit: 4. *Staff*

**PHYASST-323. Endocrinology**. This rotation offers experiences in the evaluation and treatment of a variety of endocrine problems. Credit: 4. *Staff*

**PHYASST-325. Hematology/Oncology**. This rotation offers exposure to the principles of hematology and oncology and their application in clinical practice. Credit: 4. *Staff*

**PHYASST-326. Hyperbaric Medicine**. This rotation offers experiences and exposure to hyperbaric medicine. Credit: 4. *Staff*

**PHYASST-327. Infectious Diseases**. This rotation emphasizes the evaluation and treatment of various infectious diseases. Credit: 4. *Staff*

**PHYASST-328. Gastroenterology**. This rotation emphasizes the evaluation and treatment of various gastro-intestinal problems. Credit: 4. *Staff*

**PHYASST-331. Nephrology**. This rotation emphasizes renal assessment and problem management. Credit: 4. *Staff*

**PHYASST-332. Neurology**. This rotation emphasizes experiences in neurological assessment and problem management. Credit: 4. *Staff*

**PHYASST-333. Pulmonary Medicine**. This rotation emphasizes prevention, cause, diagnosis and treatment of various pulmonary diseases. Credit: 4. *Staff*

**PHYASST-334. Rheumatology**. This rotation emphasizes experience with the assessment of joint and connective tissue disorders. Credit: 4. *Staff*

**PHYASST-336. Medical ICU**. This rotation offers an opportunity to understand the principles of medicine in an intensive care setting. Credit: 4. *Staff*

**PHYASST-337. Coronary Care Unit**. This rotation offers an opportunity to understand the principles of medicine in a coronary care unit. Credit: 4. *Staff*

**PHYASST-338. Radiology**. This rotation offers exposure to the variety of diagnostic and radiologic methods. Credit: 4. *Staff*

## OPHTHALMOLOGY

**PHYASST-381. Ophthalmology**. This rotation offers exposure to the evaluation and treatment of the eye. Credit: 4. *Staff*

## PEDIATRICS

**PHYASST-361. Pediatric Cardiology**. This rotation offers experiences in pediatric cardiovascular assessment and problem management. Credit: 4. *Staff*

**PHYASST-362. Pediatric Surgery/Cardiothoracic Surgery**. This rotation offers experiences in cardiothoracic surgery for pediatric patients. Credit: 4. *Staff*

**PHYASST-363. Pediatric Hematology/Oncology**. This rotation offers exposure to the principles of hematology and oncology and their application for pediatric patients. Credit: 4. *Staff*

**PHYASST-364. Pediatric Allergy/Respiratory**. This rotation offers exposure to evaluation and treatment of allergy and respiratory problems in the pediatric patient. Credit: 4. *Staff*

**PHYASST-365. Pediatric Endocrinology**. This rotation offers exposure to the evaluation and management of endocrine problems in the pediatric patient. Credit: 4. *Staff*

**PHYASST-366. Pediatric Infectious Disease**. This rotation emphasizes the evaluation and treatment of various infectious diseases in the pediatric patient. Credit: 4. *Staff*

**PHYASST-367. Intensive Care Nursery**. This rotation emphasizes the care of the neonate in the intensive care nursery. Credit: 4. *Staff*

**PHYASST-368. Pediatric Emergency Medicine**. This rotation offers opportunity to manage the problems and needs of the pediatric patient in the emergency department. Credit: 4. *Staff*

## SURGERY

**PHYASST-341. Cardiothoracic Surgery**. This rotation offers experiences in cardiothoracic surgery. Credit: 4. *Staff*

**PHYASST-342. Otolaryngology**. This rotation offers experiences in otolaryngology. Credit: 4. *Staff*

**PHYASST-343. Neurosurgery**. This rotation offers surgical experiences in neurological problems. Credit: 4. *Staff*

**PHYASST-344. Orthopaedics**. This rotation offers experiences in the evaluation and treatment of orthopeadic problems. Credit: 4. *Staff*

**PHYASST-345. Plastic Surgery**. This rotation offers experiences in the plastic and reconstructive surgery setting. Credit: 4. *Staff*

**PHYASST-346. Sports Medicine**. This rotation offers experiences in the evaluation and treatment of sports medicine problems. Credit: 4. *Staff*

**PHYASST-347. Urology**. This rotation offers experiences in the evaluation and treatment of urologic problems. Credit: 4. *Staff*

**PHYASST-348. Pre-Operative Screening Unit**. This rotation offers the opportunity to evaluate pre-operative patients. Credit: 4. *Staff*

**PHYASST-352. Trauma**. This rotation offers the opportunity to evaluate and treat trauma patients. Credit: 4. *Staff*

**PHYASST-353. Adult Surgical ICU**. This rotation offers exposure to the problems commonly encountered in the Surgical Intensive Care Unit. Credit: 4. *Staff*

## Postgraduate Physician Assistant Courses

**PHYASST-450. Introduction to Health Care Policy.** An introduction to the U.S. health care system. A lecture series taught by an interdisciplinary faculty and by community experts in health care policy and organization. Topics include major determinants of health and disparities, how health care is organized, delivered and financed in the U.S., health law and regulation, international comparisons and future trends .3 Credit. *Conover, Strand*

# Physician Assistant Program

**(Master of Health Sciences and Certificate)**

# Calendar

# Academic Year 2006-2007 Schedule

**Fall 2006 08/14/06 to 12/14/06**
**Spring 200 701/02/07 to 04/11/07**
**Summer 2007 04/16/07 to 06/29/07**
**Clinical Rotation Calendar for July 2006-July 2007**

| | |
|---|---|
| **Fall 2006** | |
| Rotation # 1 | July 24 - Aug 18, 2006 |
| Rotation # 2 | Aug 21 - Sept 15, 2006 |
| Rotation #3 | Sept 18 - Oct 13, 2006 |
| Rotation #4 | Oct 16 - Nov 10, 2006 |
| Rotation #5 | Nov 13 - Dec 8, 2006 |
| **Spring 2007** | |
| Rotation #6 | Jan 2 - Jan 26, 2007 |
| Rotation #7 | Jan 29 - Feb 23, 2007 |
| Rotation #8 | Feb 26 - Mar 23, 2007 |
| Rotation # 9 | Mar 26 - April 20, 2007 |
| MHS Award Date | May 13, 2007 |
| **Summer 2007** | |
| Rotation # 10 | April 30 - May 25, 2007 |
| Rotation # 11 | May 28 - June 22, 2007 |
| Rotation # 12 | June 25 - July 20, 2007 |
| Senior Seminar | July 23 – August 3, 2007 |

# *Allied Health Certificate Programs*

# School of Medicine Professional Certificate Programs

Duke University Medical Center has responded to the increased need for qualified individuals at all levels in the health care system by developing educational programs designed to equip people for a variety of positions. These programs, which vary in admission requirements and length of training, offer students both clinical and didactic experience. Graduates of these programs are awarded certificates.

Financial information is noted within each program's informational section. For all certificate programs, tuition is refunded according to the following schedule:

| Withdrawal from Certificate Programs | Refund* |
|---|---|
| Before classes begin | full amount |
| During first week | 80% |
| After first week of classes | None |

### Ophthalmic Medical Technician

The Ophthalmic Medical Technician program is currently under review and is not offered during the 2006-07 academic year.

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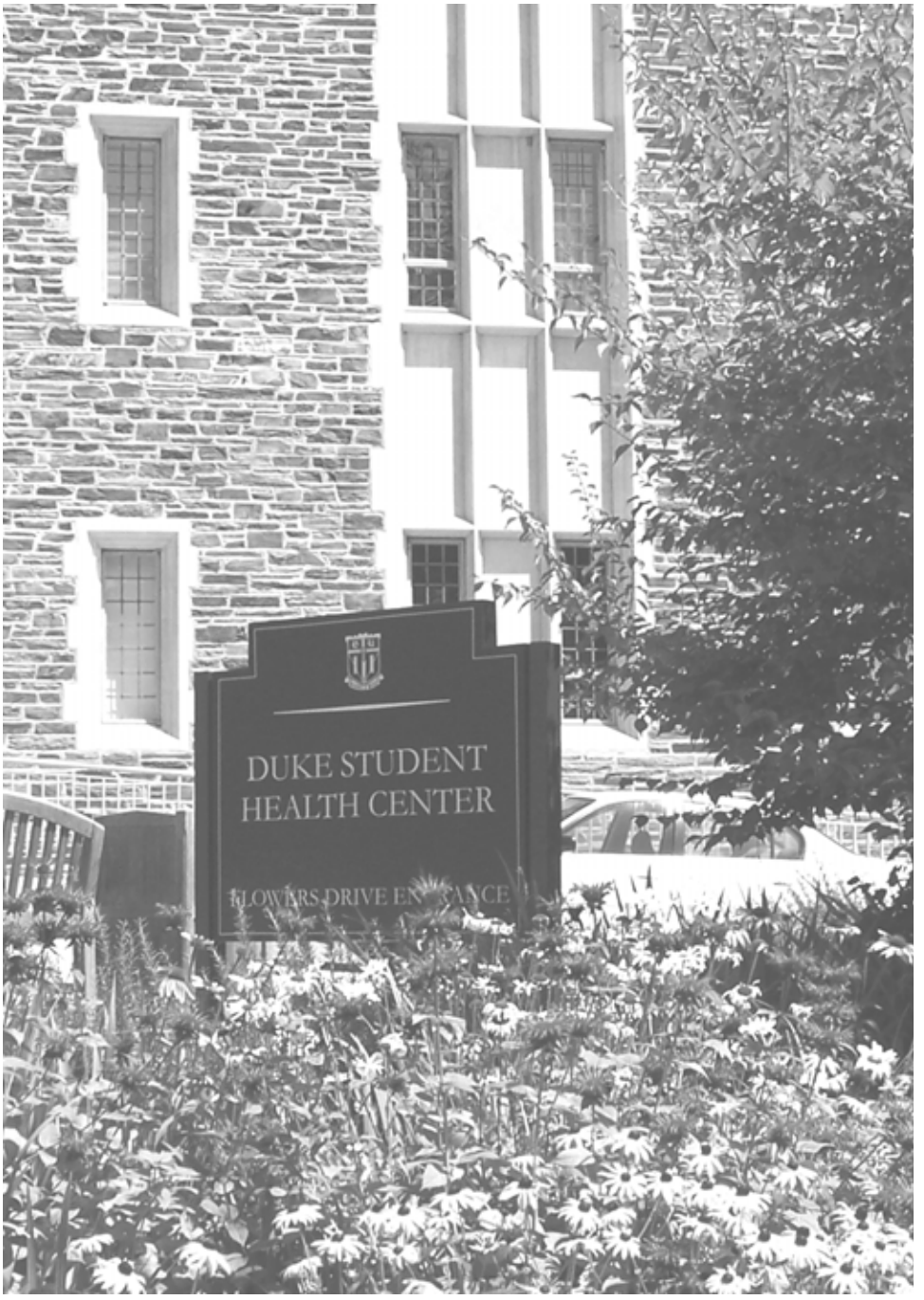
*. Includes involuntary withdrawal for academic reasons

# *General Information*



# Student Life

## CONDUCT OF STUDENTS

Duke University expects and requires of all its students cooperation in developing and maintaining high standards of scholarship and conduct.

All students are subject to the rules and regulations of the university which are currently in effect or which, from time to time, are put into effect by the appropriate authorities of the university.

Any student, in accepting admission, indicates the willingness to subscribe to and be governed by these rules and regulations and acknowledges the right of the university to take such disciplinary action, including suspension and/or expulsion, as may be deemed appropriate for failure to abide by such rules and regulations or for conduct adjudged unsatisfactory or detrimental to the university.

## LIVING ACCOMMODATIONS

Duke University has two apartment facilities on campus. One is dedicated solely to graduate and professional students (Town House Apartments) and the other is a subset of the undergraduate housing on Central Campus. The apartments are available for either continuous or academic term occupancy, are fully furnished and wired for cable, telephone and DukeNet. Information, including an on-line application, can be found at the Residence Life and Housing Services website at *http://rlhs.studentaffairs.duke.edu.*

The Town House Apartments are located approximately three blocks from the main East-West Campus bus line. These apartments are more spacious than other apartments on campus. Because of its location, residents find that these apartments offer more privacy and a change from the routine campus life and activities.

Each air-conditioned Town House Apartment includes a living room, a master bedroom, a second bedroom, a bath and a half and an all electric kitchen with dining room. Spacious closets and storage space are provided within each apartment. A swimming pool, located in the center of the complex, is open during the late spring and throughout the summer months. All utilities—water, heat, air-conditioning, gas and electricity—are provided. Residents must make arrangements with Duke University OIT Residential Services to connect cable, voice, and data services.

A portion of the Central Campus Apartments complex is set aside for graduate and professional students. Air-conditioned efficiency, two-bedroom, and three-bedroom apartments are rented to students. Efficiency units are very limited in number and are generally not available to new students. All utilities—water, heat, and electricity—are provided. Residents must make arrangements with Duke University OIT Residential Services to connect cable, voice, and data services.

Both facilities house single and married students. Single students may choose their own roommates, or Residence Life and Housing Services will assign students with similar interests and schedules together. Each single student pays rent per academic term to Duke University. Married rental rates are available on the website.

**Application Procedures.** Information about Graduate and Professional Student Housing and an on-line application can be found at *http://rlhs.studentaffairs.duke.edu.* In recognition of the unique challenges that face newly accepted international students, priority for assignment to graduate student housing is awarded to students who arrive from abroad on student visa status. Due to limited availability of space, assignment to university housing cannot be guaranteed.

## COMMUNICATION BETWEEN DUKE UNIVERSITY AND STUDENTS

Electronic mail (email) is the official medium by which Duke University communicates policies, procedures, and items related to course work or degree requirements to students enrolled at the university. All students matriculated at the university are assigned a Duke University email account upon acceptance of an offer of admission. It is the student's responsibility to check this email account regularly and to respond promptly to requests made by email.

**Off Campus Housing**. Duke Community Housing is a resource to locate off-campus rental housing options in the Durham area. Duke Community Housing maintains a database of available rental housing which is accessible through the Duke Community Housing website, *http://communityhousing.duke.edu* or the campus office. The Duke Community Housing office is located at 200 Crowell Hall, Room 216, telephone (919) 684-6711, email *communityhousing@duke.edu.* Office hours are 8:00 a.m. to 5:00 p.m. Monday-Friday. Appointments are recommended to meet with staff.

**Dining Facilities.** In addition to the food service venues in the Medical Center, a number of dining facilities are located within a short distance from the Medical Center. Duke Dining Services operates a variety of dining facilities including coffee bars, traditional cafeteria-style facilities, and fast food facilities. The many dining locations on campus give Duke students, faculty, staff, and visitors virtually unlimited dining options. For more information about campus dining options, contact Dining Services, 029 West Union, Box 90898, Durham, NC 27708-0898, (919) 660-3900, *http://auxweb.duke.edu/Dining.*

**Food and Other Expenses.** Duke Dining Services and Duke University Stores operations are located on campus to service the needs of the Duke community. The Duke University identification card, the DukeCard, serves as official identification for activities such as library book check out, recreational center, parking gate, and academic building access. The DukeCard is also the means of accessing the Dining and Flexible Spending (FLEX) Accounts. These two prepaid accounts allow students to make purchases with their DukeCard at certain Medical Center and campus Dining Services locations, retail stores, photocopiers, vending, and laundry machines. The Dining and FLEX Accounts may also be used to purchase pizza and sub sandwiches delivered to campus from several approved off-campus merchants. A FLEX Account can be opened via cash or check at either of the two DukeCard Office locations (Medical Center Parking Garage II and West Union Building) or by sending a signed contract and check in the mail to the address listed below. Additional deposits can be made at the DukeCard Office or by visiting any of the Value Transfer Stations located across campus and the Medical Center. The Dining Accounts can be activated at the DukeCard Office and will be billed to the student's bursar account. For more information about establishing an account, contact The DukeCard Office, 100 Union West, Box 90911, Durham, NC 27708-0911, (919) 684-5800, *http://dukecard.duke.edu.*

## MOTOR VEHICLE REGISTRATION

Each motor vehicle operated on Duke University campuses by students enrolled in the School of Medicine must be registered at the Medical Center Traffic Office, PRT Level, Parking Deck II, within five days after operation on the campus begins, and thereafter must display the proper registration decal.

**All students must pay an annual fee of $132 for each four-wheeled motor vehicle and $35 for each motorcycle, motorbike, or motor scooter registered.** Payment is accepted by cash or check only. To register a vehicle, the student must provide the license tag number of each vehicle to be registered. Bicycles are registered free of charge at University Transportation Services, 2010 Campus Drive.

Parking, traffic, and safety regulations are given to each student at the time of registration of the vehicle(s). Students are required to abide by these regulations.

## SERVICES AVAILABLE

The Student Health Center, (919) 681-WELL, is a joint program supported by the Department of Community and Family Medicine, Duke University Medical Center, and Student Affairs. A wide variety of services is available: general medical care, nutrition counseling, laboratory, pharmacy, travel and immunization, x-rays, cold/flu self-help table, and allergy clinic. There is a charge for x-rays, prescription drugs and some laboratory tests. The Student Health Center, located on Flowers Drive in the Duke Clinic complex (sub-basement Orange Zone), is the primary location for medical care and health promotion. Medical services are provided by board-certified faculty and by physician assistants, nurse practitioners, and resident physicians under faculty supervision. Students are seen by appointment, (919) 681-WELL, Monday-Friday, 8:30 a.m. - 5:30 p.m. (Wednesday, 9:30 a.m.–5:30 p.m.). During the academic year, a Nurse Advice Clinic operates from 5:30 p.m.–10:00 p.m. on weekdays, and an Acute Care Clinic is held on Saturday and Sunday from 11:00 a.m.–2:00 p.m. After hours nurse advice is available by telephone.

Students are encouraged to use the Student Health Center as their portal of entry to other health resources when needed, including the specialty clinics at Duke University Medical Center. This helps with coordination of appropriate care.

In the event of an obvious life-threatening emergency, students should go directly to the Emergency Department. If necessary, Duke Police (call 911 or (919) 684-2444) provides on-campus transportation to the Emergency Department.

**Health Promotion.** Health promotion staff are available to assist students in making informed decisions that promote their health. Topics include fitness assessment, nutrition, alcohol and other drug usage, eating and body image concerns, sexual activity and sexually transmitted diseases, stress management, and others. Consult the Healthy Devil online at *http://healthydevil.studentaffairs.duke.edu.*

**Student Health Physical Therapy.** The Student Health Physical Therapy Consultation Service is located in the Wilson Recreation Center on West Campus in the basement of Card Gym. A physical therapist is available several weekday afternoons (consult our website for specific days and times) when undergraduate classes are in session, on a walk-in basis, to assess exercise-related problems and to outline short-term treatment plans, aid recovery, and help prevent re-injury. Call (919) 684-6480 during the summer months for hours.

**Confidentiality.** Information regarding the physical or mental health of students is confidential and is released only with the student's permission except in life-threatening circumstances. As a member of the Duke University Medical Center, the Student Health Center is fully compliant with HIPAA federal regulations.

**Student Accident and Hospitalization Insurance.** Health insurance is essential to protect against the high cost of unexpected illnesses or injuries which would require hospitalization, surgery, or the services of specialists outside the Student Health Center. Therefore, all students are required to have such insurance. At the beginning of each fall semester, medical students must use the ACES online system to provide proof of coverage under an accident and hospitalization insurance policy or purchase the Duke Student Accident and Hospitalization Insurance policy, currently a BCBS product. This insurance policy provides protection 24 hours per day during the 12-month term of the policy of each student insured and is specifically designed to complement the coverage provided by the student health fee (see below). Students are covered on and off the campus, at home, while traveling between home and school, and during interim vacation periods. Coverage for the student's spouse and dependent children also may be purchased. Further information about this plan can be obtained from Hill, Chesson, and Woody (919) 489-7426.

**Health Fee.** All currently enrolled full-time students and part-time degree candidates are assessed a mandatory student health fee. This covers most services rendered within the Student Health Center during each enrolled semester. An optional summer health fee for students not enrolled in summer sessions is also available through the Student Health Center.

**Services Covered by the Health Fee.** The health fee covers most of the services at the Student Health Center if medically indicated and rendered by a student health provider:

- medical care for acute and chronic illness and minor injuries
- one health maintenance examination every two years

- annual gynecological exam
- some routine laboratory services
- vaccine titers for away rotations/residency programs
- administration of allergy shots
- confidential pregnancy testing
- some immunizations excluding prematriculation immunizations
- health promotion, including nutrition consultation
- mental health care at CAPS

**Services not Covered by the Health Fee.** If you are unsure whether a service is covered, please ask the Student Health reception staff in the clinic prior to receiving the service. You are financially responsible for the following:

- prescription drugs
- x-rays
- medical care provided in the Emergency Department, hospital, or other non-student health facility
- care provided by specialist consultants, including those working within the student health facilities
- dental care
- routine eye exams
- pregnancy care or deliveries
- tests, procedures, and prescriptions not medically indicated, not on the approved list, or not ordered by student health providers
- immunizations required for entrance to Duke or other universities or for travel

Student Health Center: William K. Purdy, Executive Director, 00371 Duke Clinic.

**Counseling and Psychological Services**. Counseling and Psychological Services (CAPS) is located in Suite 214, Page Building on West Campus. CAPS, a department of the Division of Student Affairs, provides a range of counseling and psychological services designed to address the acute emotional and psychological difficulties of Duke students.

The professional staff is composed of psychologists, clinical social workers, and psychiatrists experienced in working with college students. They provide direct services to students including evaluation and brief counseling/psychotherapy, with issues such as self-esteem and identity, depression, anxiety, family relationships, academic performance, dating, intimacy, and sexual concerns. Ordinarily, students are seen for counseling by appointment. If the concern requires immediate attention, a CAPS staff member assists with the emergency at the earliest possible time.

Each year CAPS offers a series of counseling, therapy, and support groups. Recent groups have focused on stress, anxiety, interpersonal process, meditation, eating and body image concerns, and dissertation support.

Another function of CAPS is to provide consultation regarding student development and mental health issues affecting not only individual students, but the campus community as a whole. The staff works with other campus personnel including administrators, faculty, the student health staff, and student groups in meeting needs identified through such liaisons. Contact CAPS at (919) 660-1000.

**Student Personal and Professional Advisory System for M.D. Program Students**. The advisory dean system is the heart of the Office of Student Affairs. Developed in 1986 in response to the need for personal advising in a highly elective curriculum, it is the current mission of the advisory program to:

- help each medical student derive the maximum benefit of his/her medical school experience and opportunities
- promote the personal, academic, and professional development of each student
- aid each student in making deliberate and thoughtful curricular and career decisions
- promote each student toward his/her future endeavors, and

- celebrate with students the milestones of personal and professional growth
- The Office of Student Affairs also coordinates medical school orientations, celebrations, and graduations, and provides access for students to other student services and resources.

# Resources for Study

The goal of Duke University School of Medicine is to provide leadership in fulfilling its core missions which are:

To provide the most advanced and comprehensive education possible; to prepare our students and trainees for lifetimes of learning and careers as leaders, practitioners, or researchers;

To perform biomedical research producing discoveries that add to understanding life processes and lead to preventing and curing disease and maintaining health;

To translate, to practice, and to make available to the public, with compassion, the benefits of the unique clinical and technological resources of the School of Medicine and to support our educational and research missions.

To the maximum extent possible, we will apply our core missions in education, research, and health care delivery to develop the means to solve regional and national health care problems, including providing accessible, cost-effective health care of measurable quality.

**Library.** The Medical Center Library, located in the Seeley G. Mudd Building, provides the services and collections necessary to further educational, research, and clinical activities in the medical field. Services are available to Medical Center faculty, staff, and students from the School of Medicine, School of Nursing, Division of Allied Health, and Duke Hospital, as well as graduate departments in the basic medical sciences. Over 290,524 volumes are available, including the Trent Collection in the History of Medicine. Approximately 742 current print subscriptions and 2,905 electronic journal titles are available. The Library has extensive back files of older volumes. The Medical Library Education Center (MLEC), located on the lower level of the Library, houses an electronic classroom for hands-on computer training. The Frank Engel Memorial Collection consists of a small group of books on consumer health and non-medical subjects for general reading, together with several newspapers and popular magazines. Traditional library services include reference, circulation, Internet assistance, and document delivery services, which are supplemented by mediated and self-service online database searching. Public workstations for searching databases and the online catalog are available in the reference area and other areas of the Library. Detailed information on services and resources may be found in the information guides available at the Library.

The Medical Center Library is open at the following times: Monday-Thursday, 8:00 a.m. – 11:00 p.m.; Friday, 8:00 a.m. – 6:00 p.m.; Saturday, 10:00 a.m. – 6:00 p.m.; Sunday, 2:00 p.m. – 10 p.m. Summer and holiday hours are announced.

Associate Dean for Library Services & Archives: Patricia L. Thibodeau, M.L.S. (Rhode Island, 1976), M.B.A. (Western Carolina University, 1991). Deputy Director: Richard A. Peterson, M.S.L.S. (Case Western Reserve University, 1977).

**Bookstore.** The Medical Center Bookstore offers a wide selection of medical reference books, textbooks, software, and instruments to the Duke University Medical Community. Clothing, including scrubs and uniforms, office supplies, and Duke gifts are also offered. Special orders are welcomed. The store is located in the Facilities Building adjacent to the PRT walkway between Duke Hospital North and Duke Hospital South and is open Monday through Friday from 8:30 a.m–5:30 p.m., and Saturdays from 10:00 a.m–4:00 p.m. The telephone number is (919) 684-2717.

**Searle Conference Center.** The Searle Conference Center for Continuing Education in the Health Sciences provides elegant accommodations for conferences, symposia, lectures, and meetings to support the continuing education activities of the Medical Center and university. Additionally, banquets, dinners, weddings, receptions, and other private events may be held on a space- available basis. Meeting space, audiovisual needs, catering, and assistance with event planning are all provided by the on-site staff. Please call (919) 684-2244.

Manager: Michael A. Evans

**Medical Center Commons.** The Medical Center Commons restaurant is open for fine dining at lunch time, Monday-Friday. Accepting credit cards, IRs, Flex Account Cards, and reservations at (919) 684-5805, the Commons is located in the Searle Conference Center on the ground floor of the Seeley Mudd Building. The restaurant features gourmet salads, homemade soups, carved meats, hot entrees, and weekly specials. Prices range from $6 to $9. Private dining rooms are available as well as morning, evening, or weekend meeting and catering space. For additional information on these services, please call (919) 684-2244. Manager: Michael A. Evans

**Medical Center Catering.** Medical Center Catering is an in-house operation that provides catering services for the Duke Health System. We will deliver coffee breaks, lunch and receptions to rooms within the North and South Hospital as well buildings accessible for push carts only(non-motorized vehicles). We provide setup and breakdown paper/plasticware service. The hours of operation are Monday thru Friday from 7:00am until 5:00pm. Please call (919) 684-2904 for assistance. Manager: Michael A. Evans

**The Office of Curriculum.** The Office of Curriculum offers expertise to the Medical School community in the areas of curriculum and course development, educational research and evaluation studies, standardized patients, faculty development, and curricular support. Interdisciplinary courses are managed from this office. Support is provided for all four years of the curriculum.

Support includes space, equipment and supplies, and services. The Thomas D. Kinney Central Teaching Laboratory (CTL), located on the fourth floor of the Davison Building, provides laboratory, demonstration, and conference space for all courses taught in the basic sciences with the exception of gross anatomy. The Medical Student Amphitheater in the Clinic Building provides space for 150 learners and is equipped with digital projectors, document and room cameras, computers for the presenter and network access for the learners, and an audience response system. Six small group rooms in the Student Affairs area in the basement, Purple Zone, complement this type of education. A Clinical Skills Lab of eight rooms in the basement, Orange Zone provides a mock clinic/hospital experience and is the site for the Clinical Performance Examination (CPX). A Patient Simulator Lab on the fourth floor, Orange Zone provides “hands on” learning of normal and abnormal physiological processes, as well as a patient’s responses to a variety of pharmaceutical agents in adults and children. The Office of Curriculum, on the fourth floor of the Davison Building, has a full-time staff of 15 who provide software support, standardized patients, instructional design, exam grading, Web-based course and exam support, in-house microscope cleaning and repair, course evaluation tabulation and reporting, database support, and help-desk support for medical students and physical therapy students, laptops, and personal digital assistants. This enables the faculty of each department to focus their efforts toward student learning. The office also supports curriculum and evaluation databases used in curriculum management and tracking of student progress, as well as Curriculum Committee and standing task force clerical support. Three deans provide expertise in curriculum assessment (Emil Petrusa, Ph.D.), curriculum development (Colleen Grochowski, Ph.D.), and curriculum oversight (Edward Buckley, M.D.). The deans have offices on the fourth floor of the Davison Building.

All first year medical students are given space (which they maintain for the entire academic year) in one of the laboratory rooms for their own work. The fourth floor of Davison Building also includes a computer cluster with electronic mail capability available to students 24 hours a day and a 24-workstation electronic laboratory for computer-assisted educational training for students, faculty, and employees.

Administrative Director: Kate Piva

**Clinical Performance Examination (CPX).** In 1993, Duke University School of Medicine developed, along with the other three medical schools in North Carolina, a standardized test of clinical performance. The CPX consists of a number of clinical cases for which the student is in the role of primary provider. Each patient, portrayed by a standardized patient, has a complaint or reason for the visit. The student begins each case by talking with and sometimes physically examining a patient and then answering questions about the data obtained from the patient. For some cases, additional radiologic or diagnostic data are available for consideration, along with data from the patient, in determining a differential diagnosis and possibly an outline of a management plan. Cases are selected to sample a variety

of dimensions including patient age, gender, all organ systems, and specialties represent through the clerkship year. The major purposes of the CPX are (a) to evaluate, in a more standardized way, each student's approach to patients with common complaints, demonstrating the orchestration of history-taking, physical examination and communication skills that cannot be adequately assessed through written tests, (b) to provide a measure of curriculum effectiveness and (c) to prepare students for Step 2 CS, a standardized patient-based assessment that is part of the physician licensing system in the United States. This preparation is achieved by giving students an experience that closely resembles the actual Step 2 CS.

Each student's encounters with standardized patients are videotaped. Tapes are available for students to review. Full-class feedback and discussion with faculty physicians occurs during assessment week at the end of the second year. The CPX is structured to be competency-based, where each student's performance is compared to a pre-determined standard. Each student receives a written report of their level of competence with each case, comments directly from standardized patients and their performance scores for five major skills as well as the class as a whole. For the assessment week in August 2006, performance on the CPX will not affect clerkship grades or academic standing. However, it is required for graduation.

**Duke Hospital.** Duke Hospital, one of the largest private hospitals in the South, is part of Duke University Health System and currently is licensed for 989 beds. The hospital directs its efforts toward the three goals of expert patient care, professional education, and service to the community. It offers patients comprehensive diagnostic and treatment facilities and special acute care and intensive nursing units for seriously ill patients. Approximately 37,000 patients are discharged annually. Surgical facilities include 26 inpatient operating rooms and 12 ambulatory surgery rooms in which surgeons perform more than 28,000 operative procedures annually. Approximately 2,900 babies are born each year in the delivery suite. Other special facilities for patients include a heart catheterization laboratory, hemodialysis unit, cancer research unit, medical and surgical intensive care units, hyperbaric oxygenation chamber, and cardiac care unit.

Duke's home care, hospice, and infusion services provide opportunities for continued care of patients after they leave Duke Hospital.

Ambulatory services include the outpatient clinics, ambulatory surgery center, the employee health service, and the emergency department, with more than one million combined patient visits annually. The clinical faculty of the Duke University School of Medicine participate in undergraduate and graduate medical education and practice medicine in the hospital and in the Private Diagnostic Clinic.

Duke Hospital, with a house staff of approximately 800, is approved for residency training by the American Medical Association, the Accreditation Council for Graduate Medical Education, and is accredited by the Joint Commission on Accreditation of Healthcare Organizations for another three years (from 2001).

**Veterans Administration Medical Center.** The Durham Veterans Affairs Medical Center, with 154 beds (plus 120 nursing home beds), annually admits over 6,000 patients. The hospital is within walking distance from the School of Medicine and has closely integrated teaching and training programs for medical students and house staff. These programs are provided by the full-time professional staff who are members of the faculty of Duke University School of Medicine.

**Lenox Baker Children's Hospital.** On November 1, 1987, the Lenox Baker Children's Hospital became a part of Duke University Medical Center, entering a new phase in its development as an orthopaedic and rehabilitation outpatient center for the children of North Carolina. A full spectrum of outpatient orthopaedic and rehabilitation services is offered to identify and meet realistic goals and to educate, support, and assist families, schools, and communities in providing a rich environment for disabled children.

**Durham Regional Hospital.** Durham Regional Hospital, a 369-bed acute care facility, became part of Duke University Health System on July 1, 1998 through a lease agreement with Durham County. As the only community hospital with tertiary care services in an eight contiguous county area, Durham Regional has a long tradition of caring for the residents of Durham and surrounding commu-

nities. A comprehensive health care facility, Durham Regional provides inpatient, outpatient, and emergency care and features a level II intensive care nursery, on-site radiation oncology service, Durham Rehabilitation Institute, and the Davis Ambulatory Surgery Center. It is also home to the Triangle's only Long-term Acute Care Hospital, operated by Select Medical. Durham Regional participates in many medical and health-related professional training experiences. The Watts School of Nursing, North Carolina's oldest nursing school, is located on-site.

**Raleigh Community Hospital.** Raleigh Community Hospital, located in north Raleigh, is a 186-bed acute care facility, which became a part of the Duke University Health System on September 15, 1998. Raleigh Community Hospital provides primary and specialty care, including a Sports Medicine Clinic, Outpatient Imaging Center, Pain Clinic, Diabetes Treatment Center, and a Cardiac Rehabilitation Center.

In addition, Raleigh Community Hospital has a comprehensive childbirth center with an LDRP birthing service, Level III Special Care Nursery, cancer center, same day surgery center, and cardiac diagnostic services.

**Other Hospitals**. Various cooperative teaching and training programs are available for medical and allied health professional students and house staff at other hospitals including Asheville Veterans Administration Medical Center in Buncombe County, John Umstead Hospital in Butner, Fayetteville Area Health Education Center in Fayetteville, and Cabarrus Memorial Hospital in Concord, North Carolina.

## Medical Center and Health System Buildings and Facilities

The 94 buildings and additions which make up the medical education, research, and patient care facilities are located on approximately 200 acres, mostly on or near the West Campus of the university.

The Clinic Zone is contiguous with the main quadrangle of the university and consists of the following: *Duke Clinic*—Ten contiguous buildings, including: *Clinic Reception Building*—Entrance lobby, clinics, food court, and amphitheater. *Edwin A. Morris Building*—Clinics, diagnostic, treatment and support services, Department of Radiation Oncology administration, departmental research laboratories, and offices. *Davison Building*—Department of Pathology administration, research laboratories and offices, Central Teaching Facility, Division of Audiovisual Education, Medical Center and Health System Administration, and School of Medicine Administration. *Original Hospital, 1940 and 1957 Additions*—Clinics, diagnostic, treatment, and support services including: Clinical Laboratories, Physical Therapy, Pharmacy, departmental offices, Medical School Admissions, Registrar, Financial Aid, Central Teaching facilities, and Student Health Clinic. *Baker House*—Department of Obstetrics and Gynecology administration, clinics, diagnostic, treatment and support services including: Speech and Hearing, Oral Surgery, Pastoral Care and Counseling, departmental offices and NeuroOncology Program. *Barnes Woodhall Building*—Psychiatry inpatient care unit, diagnostic, treatment, and support services, outpatient pharmacy, pre-operative screening, Radiology, departmental research laboratories, and offices, and Hospital administration. *Diagnostic and Treatment #3 Building*—Clinics, diagnostic, treatment, and support services, departmental research laboratories and offices. *Ewald W. Busse Building*—Center for the Study of Aging and Human Development, diagnostic, treatment, and support services, department research laboratories, and offices. *Eugene A. Stead Building*—General Clinical Research Center (Rankin), departmental research laboratories and offices. *Clinical Research II*—Department of Surgery offices, Department of Psychiatry administration, departmental research laboratories and offices, hyperbaric medicine unit. Other buildings within the Clinic zone include the *Bell Building*—offices for the Departments of Surgery, Pediatrics, Radiology, Obstetrics and Gynecology, Medicine, and Psychiatry, Duke Health Technology Solutions (DHTS), Gross Anatomy laboratories, and Brain Imaging and Analysis administration and research. *Marshall Pickens Building*—Clinics, Employee Health Services, and *Parking Garage I.*

The Hospital Zone consists of the following buildings: *Duke Hospital (Anlyan Tower and Ancillary Building)*—Inpatient care units, diagnostic, treatment, and support services including surgical suite, cath labs, Emergency Department, Labor and Delivery suite, Operating and Recovery Suite, Full-Term Nursery, Radiology, Clinical Laboratories, MRIs, Respiratory Therapy, Pharmacy, the Departments of Anesthesiology, Medicine, Radiology, Surgery administration, Cardiology

Division offices, and Brain Imaging and Analysis research. *Children's Health Center*—Children's clinics, diagnostic, treatment and support services, Department of Pediatrics administrative offices. *Joseph A.C. Wadsworth Building (Eye Center)*—Department of Ophthalmology administration, clinic, diagnostic, treatment, and support services including: operating rooms, recovery, research laboratories and offices. *Albert Eye Research Institute*—Ophthalmology faculty offices and research space and Peds Ophthalmology Clinic. *Civitan Building and Child Guidance Center*—Clinics, laboratories, and offices for the Departments of Pediatrics and Psychiatry. *Hanes House and Nursing School and new School of Nursing facility (under construction)*—Physician Assistant Program, Clinical Research Training Program, Community and Family Medicine administrative and departmental offices, and School of Nursing administrative and departmental offices, Hospital Education and teaching facilities, and Medical Center News Office. *Seeley G. Mudd Communications and Library*—Medical Center Library, Medical Center Commons, the Searle Center for Continuing Education, and the Center of Medical Ethics and Humanity. *Parking Garage II*—House Staff and Student Exercise Facility, and Nursing Recruitment.

The Research Zone consists of the following: *Joseph and Kathleen Bryan Research Building for Neurobiology*—Department of Neurobiology administration, Alzheimer's Disease Research Center, Neurobiology departmental research laboratories and offices. *Nanaline H. Duke Medical Sciences Building*—Departments of Biochemistry and Cell Biology administration, departmental research laboratories and offices. *Alex H. Sands Medical Sciences Building*—Departments of Anesthesiology, Biological Anthropology and Anatomy, Cell Biology, Obstetrics and Gynecology, Ophthalmology, Medicine and Psychiatry research laboratories and offices. *Edwin L. Jones Basic Cancer Research Building*—Departments of Immunology and Molecular Genetics & Microbiology administration, departmental research laboratories and offices. *Medical Sciences Research Building*—Comprehensive Cancer Center administration, Departments of Medicine, Obstetrics and Gynecology, Ophthalmology, Pathology, Pediatrics, Radiology, Radiation Oncology, Surgery and Cancer Center research laboratories and offices. *Clinical and Research Laboratory Building*—Department of Genetics administration, Howard Hughes Medical Institute, Departments of Cell Biology, Genetics, Medicine and Psychiatry research laboratories and offices. *Leon Levine Science Research Center, section C*—Department of Pharmacology and Cancer Biology administration, research laboratories, and offices. *Surgical Oncology Research Building, Environmental Safety Building, Research Park Buildings I, II, III and IV*—Departments of Anesthesiology, Medicine, Pediatrics, Radiology, Pharmacology, and Surgery research laboratories, offices, and hospital clinic laboratories. *Vivarium. Cancer Center Isolation Facility. Snyderman Genome Science Research Building and Genome Science Research Building-II*—genomic science research, *Medical Sciences Research Building-II (under construction) and Global health Research Building (under construction)* –occupants and research programs to be determined

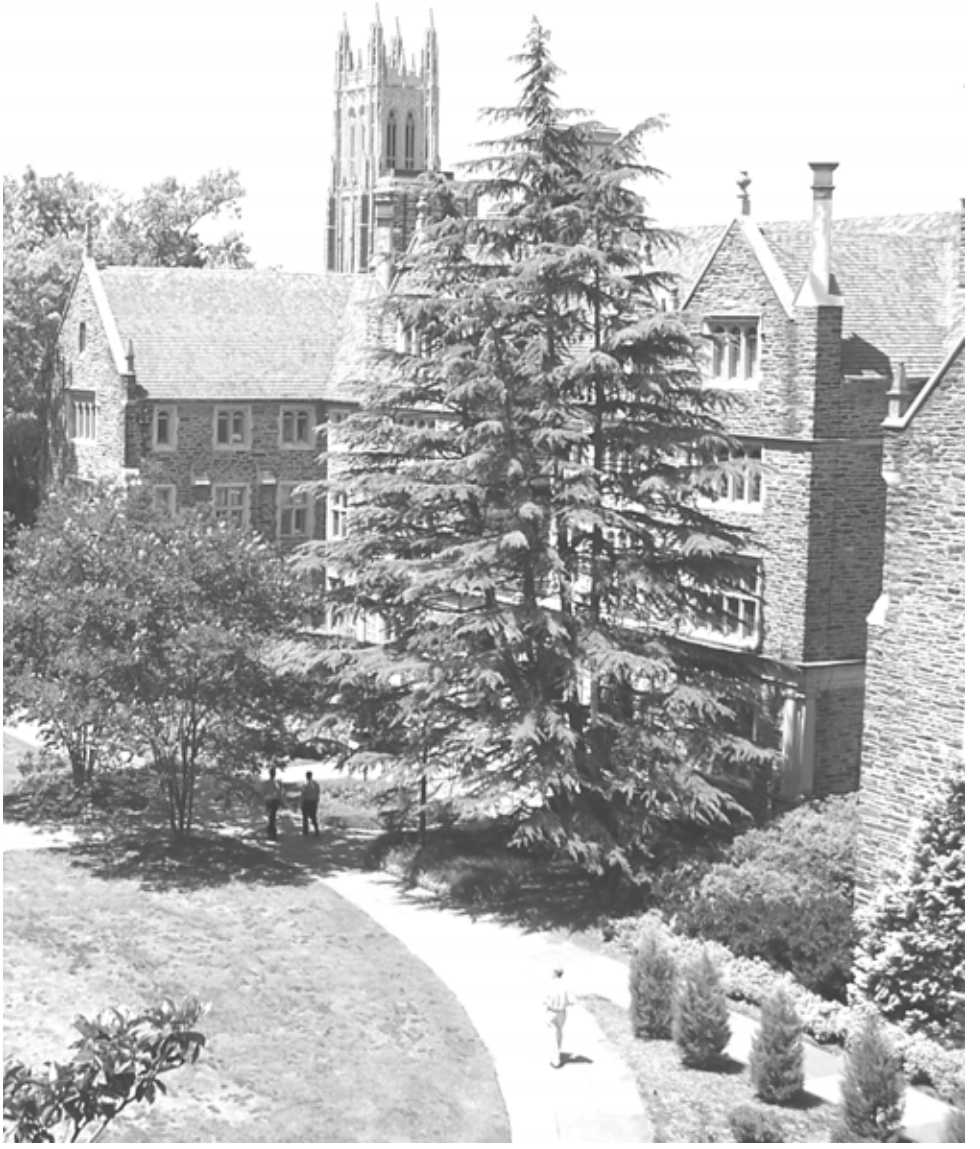
The West Zone consists of the *Lenox Baker Children's Hospital*—Clinics, diagnostic, treatment, and support services, departmental offices, and mobile MRIs. *Dialysis Center*—Treatment facility. *Center for Living Campus*—four buildings including: *Sarah Stedman Nutrition Center*—Stedman Nutrition Center administrative offices and food facility. *Andrew Wallace Clinic Building*—Clinics, diagnostic, treatment, and support services and departmental offices. *Pepsico Fitness Center*—Exercise facilities including indoor track, exercise equipment, swimming pool. *Aesthetic Services and Dermatologic Surgery Clinic*—clinics, diagnostic treatment, and support services and CFL administrative offices.

The North Campus Zone consists of the following buildings: *North Pavilion*—Ambulatory Surgery center, Adult and Pediatric Bone Marrow Transplant, Duke Clinical Research Institute (DCRI), Anesthesiology offices, Office of the University Counsel, and the Office of Continuing Medical Education. *Parking Garage III*, and *Elba and Elder Street Buildings*—Diagnostic and treatment services, offices for the Departments of Pathology, Psychiatry and Medicine, the Center for the Study of Aging, Hospital transport and laboratory services, Occupational and Environmental Safety, Medical Center Engineering and Operations, and PRMO Finance offices.

## Contact Information other Professional Programs at Duke University

- Pratt School of Engineering – (919) 660-5386
  *http://www.pratt.duke.edu/*
- School of Nursing – (919) 684-3786
  http://www.nursing.duke.edu/index.html
- Nicholas School of the Environment and Earth Science – (919) 613-8000
  *http://www.nicholas.duke.edu/*
- School of Law – (919) 613-7006
  *http://www.law.duke.edu/*
- The Graduate School – (919) 681-3257
  *http://www.gradschool.duke.edu/*
- The Fuqua School of Business - (919) 660-7700
  *http://www.fuqua.duke.edu/index_40.html*
- Divinity School – (919) 660-3400
  *http://www.divinity.duke.edu/home/*

# *Graduate Program Information*



# Graduate Program Information

**Accreditation Council for Graduate Medical Education Programs.** Appointments are from July 1 through June 30 with a few exceptions. Trainees receive stipends, professional liability insurance, disability insurance, life insurance, health insurance, parking, psychological counseling, uniforms, and laundry of uniforms.

Programs offered with the program training director of each service are as follows:

| | |
|---|---|
| Allergy and Immunology | Dr. A. Wesley Burks |
| Anesthesiology | Dr. Catherine Lineberger |
| Anesthesiology: Critical Care | Dr. Chris Young |
| Anesthesiology: Pain Management | Dr. Billy Huh |
| Cardiovascular Disease | Dr. Thomas Bashore |
| Child Neurology | Dr. Darrel Lewis |
| Child Psychiatry | Dr. Alan Chrisman |
| Clinical Cardiac Electrophysiology | Dr. Tristram D. Bahnson |
| Clinical Neurophysiology | Dr. Atif Husain |
| Critical Care Pediatrics | Dr. Brenda Armstrong |
| Cytopathology | Dr. Claudia Jones |
| Dermatology | Dr. Sarah Myers |
| Dermatopathlogy | Dr. Maria Selim |
| Emergency Medicine | Dr. Susan Promes |
| Endocrinology/Metabolism | Dr. Thomas Weber |
| Family Practice | Dr. Brian Halstater |
| Family Practice: Sports Medicine | Dr. Jeffrey Bytomski |
| Gastroenterology | Dr. Jane Onken |
| General Surgery | Dr. Michael Skinner |
| Geriatric Medicine | Dr. Kenneth Lyles |
| Geriatric Psychiatry | Dr. David Steffens |
| Hematology/Oncology | Dr. William Kane |
| Hematopathology | Dr. Patrick Buckley |
| Infectious Diseases | Dr. Gary Cox |
| Internal Medicine | Dr. Diana McNeill |
| Interventional Cardiology | Dr. Michael Sketch |
| Medical Genetics | Dr. Marie McDonald |
| Medical Microbiology | Dr. Barth Reller |
| Medicine/Pediatrics | Dr. Suzanne Woods |

| | |
|---|---|
| Medicine/Psychiatry | Drs. Diana McNeill/Grace Thrall |
| Neonatal/Perinatal Medicine | Dr. Ronald Goldberg |
| Nephrology | Dr. Steven Smith |
| Neurological Surgery | Dr. Allan Friedman |
| Neurology | Dr. Joel Morganlander |
| Neuropathology | Dr. Roger McLendon |
| Neuroradiology | Dr. James Eastwood |
| Nuclear Medicine | Dr. Edward Coleman |
| Nuclear Radiology | Dr. Edward Coleman |
| Obstetrics-Gynecology | Dr. Fidel Valea |
| Ophthalmology | Dr. Pratap Challa |
| Orthopaedic Surgery | Dr. William Hardaker |
| Orthopaedic Adult Reconstruction | Dr. Thomas Vail |
| Orthopaedic Hand Surgery | Dr. James Urbaniak |
| Ortho: Sports Medicine | Dr. Claude Moorman |
| Ortho: Foot and Ankle | Dr. James Nunley, II |
| Otolaryngology | Dr. Joseph Farmer |
| Pathology | Dr. Patrick Buckley |
| Pediatric Cardiology | Dr. Brenda Armstrong |
| Pediatric Anesthesiology | Dr. Craig Weldon |
| Pediatric Endocrinology | Dr. Michael Freemark |
| Pediatric Hematology/Oncology | Dr. Susan Kreissman |
| Pediatric Infectious Diseases | Dr. Coleen Cunningham |
| Pediatric Pulmonology | Dr. Judith Voynow |
| Pediatric Radiology | Dr. Donald Frush |
| Pediatric Rheumatology | Dr. Laura Schanberg |
| Pediatrics | Dr. Joseph M Majure |
| Plastic Surgery | Dr. Scott Levin |
| Preventive Medicine | Dr. Dennis Darcey |
| Psychiatry | Dr. Grace Thrall |
| Pulmonary Critical Care Medicine | Dr. Loretta Que |
| Radiation Oncology | Dr. Larry Marks |
| Radiology: Diagnostic | Dr. Linda Gray |
| Rheumatology and Genetics | Dr. John Sundy |
| Surgery: Critical Care | Dr. Steven Vaslef |
| Thoracic Surgery | Dr. Thomas A. D'Amico |
| Undersea & Hyperbaric Medicine | Dr. Bret Stolp |
| Urology | Dr. Glenn Preminger |
| Vascular Surgery | Dr. Richard McCann |
| Vascular/Interventional Radiology | Dr. Paul Suhocki |

Duke University Medical Center is a participating member of the National Resident Matching Program, 2450 N Street N.W., Suite 201, Washington, DC 20037-1141. All applicants for first-year, post-medical school appointments must register with this program.

The Durham Veterans Administration Medical Center adjoins the Duke University Campus and is affiliated with Duke University Medical Center. The full-time professional staff of the V.A. Medical Center are all faculty members of the School of Medicine. All training programs are

integrated with corresponding programs at the Duke University Medical Center, including rotation of house officers at each hospital.

All trainees are required to be licensed by the State of North Carolina. This may be accomplished by: (1) a residency training license that covers only training by Duke and is not convertible to a full North Carolina license, or (2) a full North Carolina license that is a complete medical license. A complete medical license is obtained either by state boards (North Carolina Boards can only be taken upon completion of internship) FLEX, USMLE Step III, or National Boards. North Carolina is not reciprocal with other states for full licenses. Duke University Medical Center cannot make applications for full license. Since house staff members must have a license before beginning duties, arrangements for the license should be made in advance. All incoming house staff must contact the House Staff Office, Box 3951, DUMC, Durham, North Carolina 27710 for current licensure requirements, and to make application for a training license.

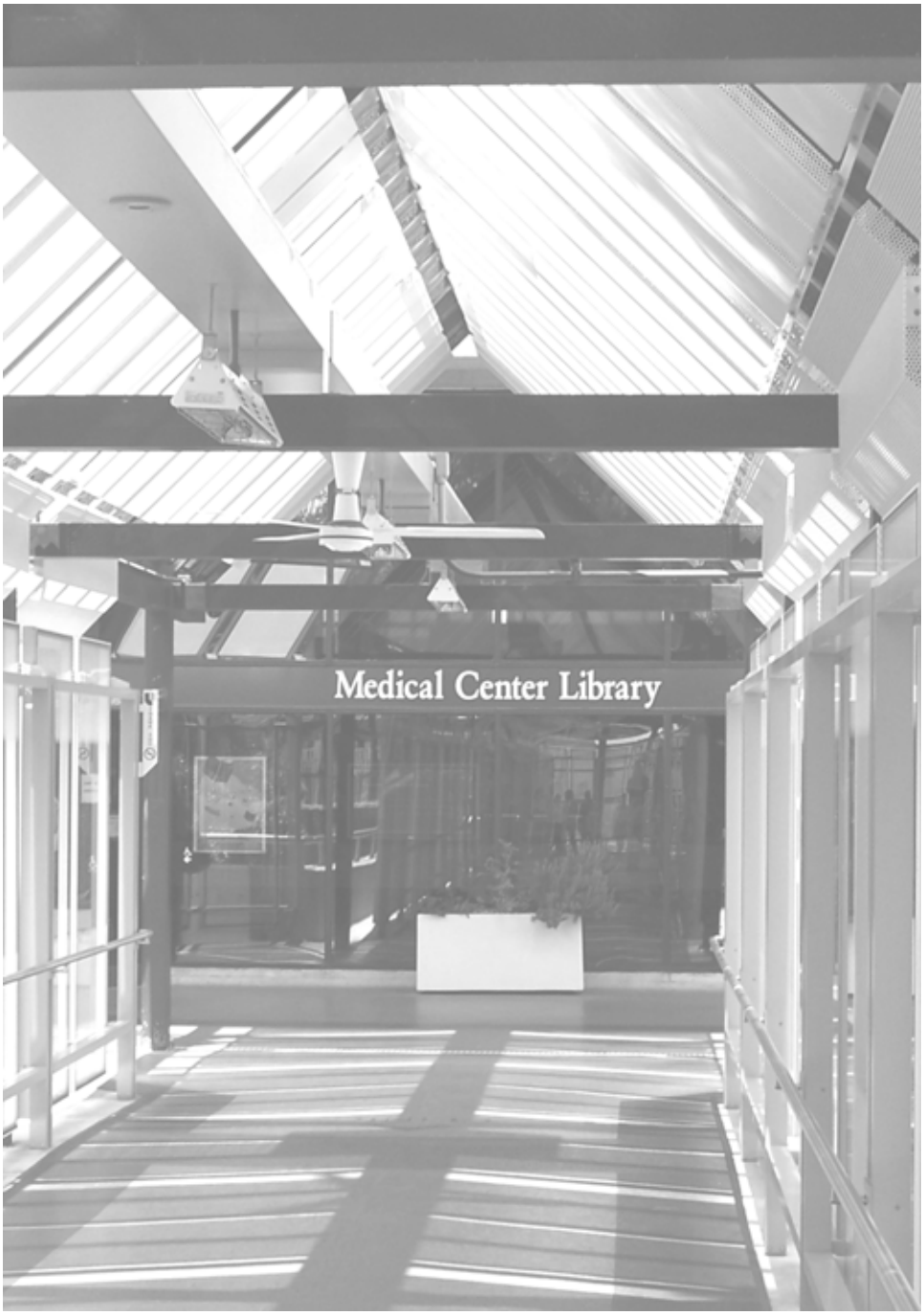
**Auditing of Courses by House Staff.** Residents and fellows at the Medical Center may audit courses through the undergraduate and graduate divisions of Duke University by obtaining the written permission of the course instructor and the dean for continuing studies and by paying the current audit fees. House staff members are not permitted to take courses offered through the division of undergraduate medical education. For more information, please contact Dr. Paula E. Gilbert, Academic Dean for Continuing Studies, The Bishop's House, Duke University, Durham, North Carolina 27708, (919) 684-2621; website: *www.learnmore.duke.edu*; email: pgilbert@duke.edu.

**International Medical Graduates (IMG).** Those persons graduating from medical schools outside the United States or Canada, must hold valid certification from the Educational Commission for Foreign Medical Graduates (ECFMG) for admission to and participation in training programs. IMGs obtain ECFMG certification by passing the following combination of exams: the United States Medical Licensing Examination (USMLE), Steps 1 and 2; the ECFMG Clinical Skills Assessment (CSA); and an English examination acceptable to ECFMG for certification purposes. Some physicians may have taken an earlier version of the USMLE under a different name such as NBME, FMGEMS, or VQE. Physicians must contact ECFMG to determine if those exams are acceptable for ECFMG certification. Write to ECFMG, 3624 Market Street, Philadelphia, Pennsylvania, 19104, or visit the website at *http://www.ecfmg.org/*. Physicians who are not United States citizens or lawful permanent residents and who need visa sponsorship by ECFMG as J-1 exchange visitors must hold a currently valid ECFMG certificate based on the two-day USMLE Steps 1 and 2, or the equivalent earlier versions. The old, one-day, ECFMG exam is not acceptable for J-1 visa purpose. Under U.S. law, ECFMG is the only J-1 program that has authority to sponsor physicians for clinical training in J-1 exchange visitor status. No other J-1 program is permitted to sponsor physicians in clinical training. Physicians who have passed additional exams and hold additional qualifications may qualify for visas other than the J-1.

Applicants should send applications directly to a department or training program. For program information and on-line applications, visit the Office of Graduate Medical Education website at *http://www2.mc.duke.edu/gme/*. An application from an IMG that does not include a copy of a valid ECFMG certificate, or other evidence from ECFMG confirming passage of all of the required exams, is considered incomplete and may be discarded without further notice to the applicant.

For further information regarding special requirements for IMGs contact Catheryn Cotten, International Office, Box 3882, Duke University Medical Center, Durham, North Carolina 27710, or visit the website at: *http://www.internationaloffice.duke.edu.*

# *Continuing Medical Education*



# Continuing Medical Education

The mission of the Continuing Medical Education (CME) Program is to assist practicing physicians, pharmacists, advanced practice providers, and other health care professionals in the translation, diffusion, and application of evidence-based knowledge to improve patient safety and enhance clinical outcomes. The Duke University Office of CME certifies all types of activities: other allied health professionals in all specialties.

To obtain a listing of current CME activities, to request CME credit for a meeting, to view your Duke CME transcripts, to fill out a disclosure form, or to contact a staff member, please visit the web p live presentations, on-line education and enduring materials (monographs, CD-ROM,etc) , for physicians, pharmacists and age at http://cme.mc.duke.edu. Our address and phone number are: Duke Office of Continuing Medical Education, Duke University School of Medicine, DUMC 104500, Durham, North Carolina 27710, (919) 401-1200. You may also contact us via email, Brooke Johnson at johns418@mc.duke.edu

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