STUDENT HANDBOOK

Department of Bioinformatics and Biostatistics

**UNIVERSITY OF LOUISVILLE
SCHOOL OF PUBLIC HEALTH AND
INFORMATION SCIENCES**

2008-2009
EDITED BY RACHEL E. CUMMINS

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FROM THE DEPARTMENT CHAIR

Dear Student:

This handbook has been prepared to acquaint you with the Department of Bioinformatics and Biostatistics at the University of Louisville. It contains policies and procedures and important information you need to know in order to be a successful student.

This publication is meant to be a supplement to the *University of Louisville Graduate School Catalog*. There may be policy or curriculum changes in the handbook that differ from those in the Catalog. In these cases, the Handbook supersedes information in the Catalog. However, all policies and procedures of the Graduate School must be adhered to by all graduate students in the Department of Bioinformatics and Biostatistics. Additional information and University student policies are printed in the *University of Louisville Student Handbook and* the University of Louisville Schedule of Courses, and are available on the University of Louisville website, www.louisville.edu.

It is the student's responsibility to read the Catalog, student handbooks, and official notices to be informed about grades, credits, requirements, and to abide by the regulations of the University of Louisville, the School of Public Health and Information Sciences, and the Department of Bioinformatics and Biostatistics.

Richard N. Baumgartner, Professor and Acting Chair
University of Louisville
School of Public Health and Information Sciences
Department of Bioinformatics and Biostatistics
Health Sciences Center, K Building 4th Floor
555 S. Floyd Street
Louisville, KY 40292

(502) 852-2797
(502) 852-3294 (FAX)

Department of Bioinformatics and Biostatistics Mission Statement

The Department of Bioinformatics and Biostatistics is dedicated to the proper application of research methods in Bioinformatics, Biostatistics, and Decision Science, and to the training of professionals in each of these areas. This mission consists of three interrelated parts: Education, Research, and Service.

Education
To train professionals in the theory and practice of Bioinformatics, Biostatistics, and Decision Science so that they can contribute statistical, decision-making, and other analytical expertise within academic settings, industry, government agencies, and healthcare organizations.

Research
To advance the disciplines of Bioinformatics, Biostatistics, and Decision Science by conducting primary methodological research in these areas and by collaborating with members of the research community at UofL.

Service
To provide consulting services in Bioinformatics, Biostatistics, and Decision Science to the research community and the UofL Health Sciences Center.

Department of Bioinformatics and Biostatistics Web Page

1. http://louisville.edu/sphis/bb

Contacting Department of Bioinformatics and Biostatistics Faculty or Staff

1. Telephone Messages: You may leave a message for a faculty or staff member with the Department of Bioinformatics and Biostatistics assistant (852-2797) or you may leave a voice mail message with individual faculty/staff members at their respective phone extensions.
2. E-Mail: All faculty and staff have e-mail accounts and you may communicate with them via e-mail.
3. Faculty-Staff Mailboxes: Written messages or materials for faculty/staff may be given to the department assistant who will place the items in the appropriate mailbox.

Department of Bioinformatics and Biostatistics Faculty

Richard N. Baumgartner, Ph.D.
Professor and Acting Chair
852-3003, rnbaum01@louisville.edu
Research interests: Body Composition, including obesity, sarcopenia and osteopenia in relation to aging, chronic disease, and disability. Nutritional, hormonal, and inflammatory biomarkers. Molecular epidemiology. Breast Cancer.

Guy Brock, Ph.D.
Assistant Professor
852-3444, guy.brock@louisville.edu
Research interests: The areas of statistical genetics and the analysis of microarray data. Recent projects include developing methods for nonparametric linkage analysis in extended pedigrees, evaluating methods for handling selection bias in linkage studies, and missing value estimation in microarray data. Also interested in developing methods for handling proteomic data.

Somnath Datta, Ph.D.
Professor, Ph.D. Graduate Coordinator and Program Director
852-6376, somnath.datta@louisville.edu
Research interests: Various topics in Statistics and Biostatistics such as Bioinformatics, Bootstrap Methods, Compound Decision Problems, Empirical Bayes Methods, Nonparametric Function Estimation, Statistical Genetics, Survival Data Analysis, Time Series Analysis etc. Currently working on multistage data that are an important special case of multivariate survival or event time data. Also interested in nonparametric and semiparametric inference procedures for such multistage models. Interested in nonparametric inference procedures for marginal effects in clustered data, such as those arise in longitudinal studies. In the area of Bioinformatics, working on developing novel statistical methods for gene expression and proteomic data.

Susmita Datta, Ph.D.
Associate Professor and PhD Emphasis Coordinator in Bioinformatics
852-0081, susmita.datta@louisville.edu
Research interests: Bioinformatics, Biostatistics, Statistical issues in Population Biology, Statistical Genetics, Infectious Disease Modeling and Survival Analysis. Also involved in developing statistical methods for analyzing microarray data. I have been working on the problems of modeling gene expression profiles through partial least squares regression, validation of clustering algorithms for grouping genes and developing various statistical tools for detection of differential gene expression. I am also actively interested in proteomic data (MALDI-TOF, SELDI) analysis to understand disease etiology (colon, lung cancer etc.). I am involved in collaborative research with interdisciplinary scientists from Biochemistry, Biology, Public Health and Computer scientists.

L. Jane Goldsmith, Ph.D.
Associate Professor

852-8780, jane.goldsmith@louisville.edu
Research interests: Primarily collaborative research in medicine and dentistry. Also interested in statistical methodology research relating to sample size, information theory, nonlinear models, and inter-rater agreement.

Maiying Kong, Ph.D.
Assistant Professor
852-3988, maiying.kong@louisville.edu
Research interests: Parametric and semiparametric response surface modeling in drug interaction; Bioassay; Linear and nonlinear regression; High dimensional splines; Mixed effect models; Generalized linear models; Pre-clinical studies; Early phase studies; PD/PK modeling; Statistical computing.

Steven J. McCabe, M.D., M.Sc.
Assistant Professor, M.S. Graduate Coordinator, and PhD Emphasis Coordinator in Decision Science
852-3300, smccabe@kkahand.com
Research interests: Clinical research as it relates to hand and upper extremity surgery. Also interested in measuring the results of treatment including the use of outcomes questionnaires and utility measurements. Interested in all aspects of the management of carpal tunnel syndrome. Currently developing an interest in cost-effectiveness analysis in upper extremity surgery.

John A. Myers, Ph.D.
Assistant Professor
852-3986, john.myers@louisville.edu
Research interests: Problems in health care economics and the impact of these problems on public policy and medical guidelines. Examining the theoretical foundations of cost-effectiveness analysis, including such issues as measuring the effectiveness of interventions that have an influence on two closely linked individuals, more precisely modeling quality adjusted life years gained over time, and the role risk attitudes play in assessing the effectiveness of health care interventions. Another major area of study is investigating the position religiosity and spirituality has in the care of chronically ill patients and patients receiving end of life care. Other work includes examining HIV disease progression, modeling the transition from use of alcohol to dependence of alcohol, and the interrelationship of donor's and recipients during organ transplantation.

Rudolph S. Parrish, Ph.D.
Professor
852-3283, rudy.parrish@louisville.edu
Research interests: Statistical methods in bioinformatics with applications to high-dimensional biology techniques, statistical computing, clinical trial design, group-sequential methods, linear and mixed-effects models, and modeling. Current activity is in evaluation of statistical methods for analysis of microarray data through simulation approaches and use of genomic biomarkers in clinical trials.

Adriana Perez, Ph.D.
852-3525, a0pere03@louisville.edu
Research interests: Statistical methods for missing data; statistical modeling & modeling strategies; sample size estimation; design, conduct and analysis of multi-center clinical trials; measurement error models; measures of concordance and statistical methods suited to epidemiological research.

Shesh Rai, Ph.D.
852-4030, shesh.rai@louisville.edu
Research interests: Retrospective/prospective studies in cancer and clinical research, including randomized trials, behavior interventions, in single, multicenter and industry sponsored studies, longitudinal and survey data, survival analysis, clinical trials, mixed effects (hierarchical) models, sample survey, bioinformatics, and quantitative risk assessment.

Dongfeng Wu, Ph.D.
852-1888, dongfeng.wu@louisville.edu
Research interests: Probability modeling and statistical inferences in periodic cancer screening.

Jae Keun Yoo (Peter)
Assistant Professor
Research interests: Sufficient dimension reduction, Linear and Non-linear model, Survival analysis, Bioinformatics, Multivariate analysis

Department of Bioinformatics and Biostatistics Staff

Savitri Appana, M.S.
Biostatistician
852-7676, snappa01@louisville.edu

Lauren Asher
Program Assistant
852-2797, Lauren.asher@louisville.edu

Alex Cambon, M.Eng.
Biostatistician
852-4111, accamb01@louisville.edu

Rachel E. Cummins
Program Assistant
852-1827, Rachel.Cummins@louisville.edu

Douglas J. Lorenz, M.S.P.H.
Biostatistician
852-3635, Douglas.Lorenz@louisville.edu

Delayed Class Schedule for Bad Weather

Regular University classes follow the Delayed Class Schedule for Bad Weather, which is printed in the Schedule of Courses. Weekend classes may be canceled for bad weather. There is no delayed schedule for weekend classes. Faculty will make special arrangements to make up classes because of the cancellation.

University Holidays and Academic Calendars

In addition to the Calendar of Events, the U of L Web site has other calendars, including "University Holidays," which lists the dates university offices are closed. It is at www.louisville.edu/ur/onpi/infoctr/holidays.htm.

"Academic Calendars" cover the academic year and are located at www.louisville.edu/ur/onpi/infoctr/academic.htm.

Mail Folders / Bulletin Boards

Mailboxes for graduate students are located in the 4th floor computer lab.

Student Lounge

The lounge for School of Public Health and Information Sciences students is located in K Wing room 4002. Students are able to print from the 4th floor computer lab to the printer in the student lounge for no charge.

Cardinal Card Student ID
7520, www.louisville.edu/campuscard

New students receive a card during orientation. They should take their student ID and a photo ID to the main office in Room 08K of the Houchens Building (on the Belknap Campus) or to the satellite office at the first-floor security station of the Abell Building. Office hours are 8:30 a.m. to 5 p.m. weekdays at the main office and 2 p.m. to 4 p.m. Tuesdays at HSC. Hours will be extended and will include weekends at the beginning of the semester. Call for details.

Catalogs and Course Schedules
Registrar's Office, Houchens, 6522
www.louisville.edu/student/services/registrar

Online catalogs are available at www.louisville.edu/provost/undergrad/catalog, and at graduate.louisville.edu/catalog/default.htm. New and returning students with a valid ID can get a copy of the 2006-2007 undergraduate catalog or graduate catalog from the registrar's office, ACCESS office, Office of Admissions, University Bookstore,

information centers, Office of Continuing Studies (Shelby Campus) and the Fort Knox Education Center. There is a $1 charge.

Financial Aid
Financial Aid Office, Houchens, 5511
www.louisville.edu/student/services/fin-aid

When financial aid arrives, students will receive a residual check. They can verify the status of financial aid forms, awards and electronically transferred funds at www.louisville.edu/student/services/fin-aid or they can call the automated voice response system at 2222.

Parking Permits
Department of Public Safety, 7275
www.louisville.edu/admin/dps/parking

Please visit the Department of Public Safety's website for up to date permit prices, parking regulations, and maps.

Tuition Payment
Bursar's Office, Houchens, 6503

Information on tuition rates and payment options is available at www.louisville.edu/admin/bursar/bursttf1.htm.

Postal Services

A postal office is located on the ground level of the HSC Library & Commons Bldg. Hours of operation are 12noon-3pm, Monday through Friday. Phone number is 5339.

Health and Safety

Escort Service
Department of Public Safety, 6111
The DPS provides an on-campus escort service seven days a week from dusk to dawn. Call DPS for an escort.

Health Insurance
6479, admissions.louisville.edu/orientation/summer/ insurance.html
Student insurance plans include in-patient and outpatient care and spouse and dependent coverage. It is available for students who have no insurance or those who already have hospitalization coverage.

Routine Health Services
Belknap Campus, Health Services Building, 6479; HSC, Ambulatory Care Building, 6446

Student health services provide the same services as a regular physician and can give some prescriptions. Offices are open 8 a.m. to 4:30 p.m. Appointments are preferred.

Emergency Health Services
A student health services practitioner is on call after hours to answer questions via telephone that cannot wait until the next business day. HSC has a protocol for needle sticks that can be initiated over the telephone by calling 6446.
If an emergency takes place on campus, call 911 or the campus police at 6111. During office hours, health services can take care of minor on-campus emergencies if the patient can come to the office. When a person needs medical attention after office hours, they should go to an immediate care center that is approved by their insurance carrier or to an emergency room.

HSC Bookstore

The Health Science Center Bookstore, located on the first floor of the K Wing Bldg. (Floyd Street Side), carries textbooks and supplies for courses taught on the HSC campus. Textbooks, lab coats, pens, binders and other supplies are available for purchase. Novelty items, sweatshirts, mugs, bumper stickers, greeting cards, candy and other items are also available. Hours of operation are:

9am-6pm	Monday-Thursday
9am-4:30pm	Friday
11am-3pm	Saturday

Gray's College Bookstore, located at 6565 Second Street off Broadway next door to McDonalds, also carries textbooks and supplies.

Photocopying

For smaller jobs, students may use the copy machine located in room 4020 of the K Building. For larger jobs, students must use the coin-operated machines located in the Kornhauser Library.

Kornhauser Library

The Kornhauser Library, located on the second floor of the Library & Commons Building, is the main library for the HSC campus. Books related to the health sciences, professional journals and periodicals, and other publications are available to students. Hours of operation are:

8am-10pm	Monday-Thursday
8am-6pm	Friday
10am-7pm	Saturday
1pm-9pm	Sunday

Official and Unofficial Transcripts/Records Verification

Students may request official transcripts on-line through the University Registrar's Office. Students may also now print unofficial transcripts on-line. To request an official transcript, or to print an unofficial transcript, please visit:
http://www.louisville.edu/student/services/registrar/services.htm
Official transcript requests usually take 3-5 business days to be processed and mailed. Students may also request transcripts by going directly to the Registrar's Office on Belknap campus.

Students may be required to provide proof of good standing for scholarship applications, insurance forms, or to enroll at another school as a visiting student. When these situations occur, you should plan ahead and allow at least 24 hours for request of this nature to be processed. "While you wait service" is not available.

Address/Name Changes

It is the student's responsibility to notify the University of Louisville of any changes in name and/or address. Address, name, and phone number changes can be made by visiting ULink. If you fail to notify the school of your address change, the Department is not responsible for problems that may arise if information we distribute by mail is not received by you.

No Smoking

The Health Science Center campus has been designated as smoke-free. Smoking is not allowed in any office, classroom, or laboratory site on the Health Science Center campus. Smoking is no longer allowed on the Health Sciences Campus, including outdoor areas.

Disability Statement

Students with disabilities, who need reasonable modifications to successfully complete assignments and otherwise satisfy course requirements, are encouraged to meet with the instructor as early as possible to identify and plan specific accommodations. Students may be asked to supply a letter from the Disability Resource Center or other documentation, which will assist in modification planning.

Policy on Work-Restricted Religious Holidays

Federal law and University policy prohibit discrimination on the basis of religious belief. Students who observe work-restricted religious holidays must be allowed to do so without jeopardizing their academic standing in any course. Faculty are obliged to accommodate students' requests for adjustments in course work on the grounds of religious observance, provided that the students make such requests in writing during the first two weeks of term.

The Department of Bioinformatics and Biostatistics Chair must investigate and resolve student complaints arising from alleged faculty failure to make reasonable accommodation under these guidelines.

Note: A calendar of typical work-restricted holidays is available at http://www.louisville.edu/provost/holidays.html. This list is not exhaustive. Information about specific holidays is also available by phone from the University Multicultural Center at 8867.

Student Government Association

The purpose of the School of Public Health and Information Sciences Student Association" or "SPHIS Student Association" is to empower the students of SPHIS to make group decisions, take group actions, and participate in governance of SPHIS through an organization that is operated entirely by and for the students of SPHIS. The intent of the Association is to become a Registered Student Organization in the University of Louisville.

A member of the Association is any student currently enrolled in a degree program in SPHIS, whether full-time or part-time. For a student to be considered currently enrolled, the student must be enrolled in at least one course. A newly enrolled student in a degree program in SPHIS is not a member until the first day of classes for the semester in which the student is first enrolled. If a member leaves the degree program in which he or she is enrolled, he or she is no longer a member.

A member of the Association is any student currently enrolled in a degree program in SPHIS, whether full-time or part-time. For a student to be considered currently enrolled, the student must be enrolled in at least one course. A newly enrolled student in a degree program in SPHIS is not a member until the first day of classes for the semester in which the student is first enrolled. If a member leaves the degree program in which he or she is enrolled, he or she is no longer a member.

Members may:

      Vote in elections or referenda of the Association
      Run for elected positions in the Association
      Serve on SPHIS Council of Chairs and Deans and SPHIS Faculty Forum
      Serve as representative of SPHIS on Graduate Student Council
      Petition for a meeting or vote by entire membership on one or more issue

SPHIS Policy on Academic Dishonesty

Determination of a Violation of Academic Honesty

A violation of academic honesty will be determined solely by the director of the course involved or, in the event that a violation of academic honesty is not related to a specific course, the director of the student's academic program. The information on academic dishonesty presented in the University policy, reproduced below, represents guidelines to help the student understand several major aspects of academic dishonesty. These guidelines cannot exhaustively define academic honesty or dishonesty.

If the student is uncertain whether a planned activity or behavior could be construed as a violation of academic honesty, the student is strongly advised to discuss the matter with the course director or, if applicable, the program director prior to engaging in the activity or behavior.

Absence of Consideration for Ignorance of Policies on Academic Honesty

Students are expected to be familiar with applicable policies on academic honesty. Ignorance of one or more of these policies will neither excuse a violation nor be considered in determining disciplinary actions.

Plagiarism and Electronic Sources of Information

The following is intended to amplify and emphasize the inclusion of electronic sources of information as sources that must be cited as references when material is used from them. Information that is available through the Internet or from other electronic sources is not considered to be common knowledge solely because it is available widely and electronically. Designation of common knowledge is limited to knowledge that is widely known either generally or within a specific field or discipline. If the student is unclear whether an item of information is common knowledge or not, he or she is strongly advised to cite the source.

Disciplinary Procedures for a Violation of Academic Honesty

The course director may take whatever disciplinary action or actions he or she determines to be appropriate in response to a violation of academic honesty. These actions may include, for example, failing the course and denial of retaking the course.

The course director may also recommend to the academic program director that the student be dismissed or expelled from the program, which may be done at the sole discretion of the program director.

If the violation of academic honesty is not related to a specific course, the program director may take whatever disciplinary action he or she determines to be appropriate, including, for example, suspension or dismissal from the program.

Registration Procedures

The University of Louisville ULink course registration system is available at http://ulinklouisville.edu. You will need you student ID number, password, and the four digit number assigned to each course in order to add, drop, or exchange courses in ULink. The University has also implemented a touchtone registration system, (502) 852-2222. Students register for courses by phone according to the total number of credit hours and an alphabetic rotation established by the University's Office of Registration. Specific registration instructions will be listed in the Schedule of Courses each semester or available on the web: www.louisville.edu/registar . Students may also register at http://ulink.louisville.edu.

Students are required to meet with their assigned faculty advisor prior to registration if they need assistance in course selection. Advisors will be assigned to students before initial matriculation in DBB degree programs. If students have any questions about your advisor assignment or procedures, they should contact the department assistant at 852-2797.

Students who register for courses without having met the prerequisites will have their registration canceled and will be required to re-register on a space available basis. Registrations will also be canceled for continuing students on probationary status who fail to meet with their advisor prior to registering. Advising holds are placed on all students prior to each semester's open registration period. The hold will be removed when the student's assigned advisor has contacted the Department assistant to indicate that advising has taken place. Re-registration will be on a space available basis.

Drop/Add Procedures

Students wishing to alter their schedule of courses in any way must make the changes with the University's Office of Registration. Failure to officially withdraw from a course may result in a grade of F.

Students may drop/add at any time during the Early Registration period after their first scheduled time for registration. The touch-tone and ULink systems may be used for drop/add. See the Schedule of Courses for current instructions for Drop/Add after classes begin.

Students may not withdraw from any course after the published deadline in the Schedule of Courses without the approval of their assigned advisor and Graduate School Dean. The grade report will reflect a grade of "W".

Assistantship students are required to be enrolled full-time (nine hours in both the fall and spring semesters and six hours in the summer) in order to maintain those assistantships. Any student who drops below a full-time course load will have their assistantship pay suspended.

CURRICULUM

The current program provides a concentration in Biostatistics for the M.P.H. degree, concentrations in either Biostatistics or Decision Science for the M.S. degrees and a Ph.D. in Biostatistics.

The Ph.D. program will be available to students who are continuing in the UofL M.S. program or to students entering the program with a master's degree in biostatistics, statistics, decision science, or a related discipline. In conjunction with their advisor, students will develop a plan for completing required and elective courses.

Program of Study

Upon admission to the Ph.D. program, a Program of Study will be developed for each student by a faculty advisor and approved by the Department Chair. The Graduate Coordinator will assume the role of faculty advisor until the student chooses a dissertation advisor at which point this responsibility will be shifted to the dissertation advisor. If it becomes clear that a Ph.D. student will be working with a given faculty member prior to forming a dissertation committee, the student may request a change in course advisor by completing the form "Request to Change Academic Advisor" form and having it signed by the Graduate Coordinator, the new academic advisor, and the Department Chair. Ph.D. students who did not complete the M.S. in the Department of Bioinformatics and Biostatistics may be required to complete additional coursework normally offered in the M.S. program. Decisions regarding additional coursework will be made by the student's assigned faculty advisor and such courses will become part of the Program of Study. This approach gives maximum flexibility for addressing differing student qualifications and interests.

Course of Study for the M.P.H. Degree with a Concentration in Biostatistics

Course	Course Title	Credit Hours

Year 1 Fall Semester

Course	Course Title	Credit Hours
PHEP 511	Introduction to Epidemiology	3
PHST 600	Introduction to Biostatistics I	3
PHMS 601	Introduction to Public Health Practice and Administration	3
PHKC 696	Issues in Public Health	2

Year 1 Spring Semester

PHEH 600	Introduction to Environmental and Occupational Health	3
PHKC 601	Introduction to Health Behavior	3
PHST 610	Statistical Computing & Data Mgmt. for Public Health	3
PHKC 696	Issues in Public Health	2

Year 2 Fall Semester

PHCI 624	Clinical Trials I	2
PHST 726	Clinical Trials Stats Lab	1
PHST 620	Introduction to Statistical Computing	3
PHST 679	Public Health Practicum	3
PHKC 696	Issues in Public Health	2

Year 2 Spring Semester

PHST 640	Stat Methods for Rsch Design in Health Studies	3
PHST 679	Public Health Practicum	3
PHST 681	Biostatistical Methods II	3
PHKC 696	Issues in Public Health	2
PHKC 697	Integrating Learning and Experience in Public Health	1

Total Program Credits = 45

Master of Science (MS)
Concentrations in Biostatistics or Decision Science (June 2007 Revision)

Course	Course Title	Credit Hours
Year One Fall Semester		
PHEP 601	Introduction to Epidemiology	3
PHST 661	Probability	3
PHST 680	Biostatistical Methods I	3
Year One Spring Semester		
XXX XXXX	ELECTIVE*	3
PHST 662	Mathematical Statistics	3
PHST 681	Biostatistical Methods II	3
Year Two Fall Semester		
PHST 602	Biostatistics-Decision Science Seminar	1
PHCI 624	Clinical Trials I	2
Biostatistics concentration:		
PHST 683	Survival Analysis	3
PHDA 666	Master's Thesis Research	3
Decision Science concentration:		
PHDA 666	Master's Thesis Research	3
PHDA 663***	Analysis for Decision Making	3
Year Two Spring Semester		
PHST 602	Biostatistics – Decision Science Seminar	1
PHDA 603	Public Health Practicum I	2
Biostatistics concentration:		
PHST 684	Categorical Data Analysis	3
PHDA 666	Master's Thesis Research	3
Decision Science concentration:		
PHDA 666	Master's Thesis Research	6
Total credit hours required for Biostatistics concentration:		**36**
Total credit hours required for Decision Science concentration:		**36**

* Elective must be chosen from the following list or as approved by student's assigned advisor:
- MATH 566 - Nonparametric statistics
- PHCI 605 - Survey research methods
- PHCI 622 - Case-control Studies
- PHCI 623 - Cohort Studies
- PHBI 750 - Statistical Methods for Bioinformatics
- PHEH 600 – Introduction to Environmental Health

** Students enrolled in PHCI 624 are strongly encouraged to enroll in PHST 726 "Clinical Trials Statistics Laboratory

***Cross listed as IE 643

Doctor of Philosophy in Biostatistics

Program Director: Somnath Datta, Ph.D.
Graduate Coordinator: Somnath Datta, Ph.D.
Emphasis Coordinators: Steven J. McCabe, M.D., M.Sc.   Decision Science
                           Susmita Datta, Ph.D.   Bioinformatics

Students who complete the M.S. program in biostatistics with the Department of Bioinformatics and Biostatistics or who already possess the equivalent of an M.S. in statistics, biostatistics, decision science, or a related discipline may apply for admission to the Ph.D. program.

The Ph.D. program in biostatistics is located in the Department of Bioinformatics and Biostatistics.

Curriculum

The curriculum consists of a minimum of 37 credit-hours of coursework, including nine hours of dissertation work (PHDA-777). The student is eligible to sit for comprehensive examinations upon completion of required coursework. Upon passing the comprehensive examinations, the student enters candidacy to work on the dissertation. After the dissertation is submitted and approved, including an oral defense, the student is eligible to receive the Ph.D. degree in biostatistics.

Faculty Advisor

Upon admission to the Ph.D. program, each student is assigned to the graduate coordinator of the Ph.D. program for course advising. The graduate coordinator assumes the role of faculty advisor until the student chooses a dissertation advisor at which point this responsibility shifts to the dissertation advisor. If it becomes clear that a Ph.D. student will be working with a given faculty member prior to forming a dissertation committee, the student may request a change in course advisor by completing the form "Request to Change Academic Advisor" and having it signed by the graduate coordinator, the new academic advisor, and the department chair.

Program of Study

Upon admission to the Ph.D. program, a program of study is developed for each student by a faculty advisor and approved by the department chair. Students who did not complete the M.S. program in biostatistics with the Department of Bioinformatics and Biostatistics may be required to complete additional coursework normally offered in the M.S. program. Decisions regarding additional coursework are made by the student's assigned faculty advisor and such courses become part of the program of study. This

approach gives maximum flexibility for addressing differing student qualifications and interests.

Degree Requirements

Completion of the coursework is the prelude to sitting for the comprehensive examination. Successful completion of the comprehensive examination allows the student to enter doctoral candidacy. A doctoral candidate must then develop and successfully defend a dissertation proposal that describes an original and independent research project. Upon successful defense of the proposal, a student may then proceed to continue dissertation research. Upon successful completion of the research, defense of the dissertation, and demonstration of the required competencies listed below, a student is awarded the Ph.D. degree.

The Ph.D. program in biostatistics is a 37 credit-hour program (minimum beyond a master's degree) including the dissertation. Additional hours may be needed for completion of the program.

Coursework

37 total credit-hours
      28 credit-hours of required coursework
       9 credit-hours of dissertation research

Required Coursework			
Emphasis (if any)	*Course #*	*Course Title*	*Credit-Hours*
All	PHST-710	Advanced Statistical Computing I	3
	PHST-762	Advanced Statistical Inference	3
	PHST-781	Advanced Linear Models	3
	various	Elective	3
	PHST-703	Doctoral Practicum in Consulting	1
	PHDA-777	Dissertation Research	9
	Subtotal		22
No emphasis	PHST-691	Bayesian Statistics	3
	PHST-724	Advanced Clinical Trials	3
	PHST-780	Advanced Nonparametrics	3
	PHST-782	Generalized Linear Models	3
	PHST-783	Advanced Survival Analysis	3
	Subtotal		15
Emphasis on decision science	PHDA-690	Utility Theory and Assessment	3
	PHST-691	Bayesian Statistics	3
	PHDA-701	Advanced Medical Decision Making	3
	PHDA-663	Decision Analysis	3

Required Coursework			
Emphasis (if any)	*Course #*	*Course Title*	*Credit-Hours*
	PHDA-705	Statistical Methods for Cost-Effectiveness Analysis	3
	Subtotal		15
Emphasis on bioinformatics	PHBI-751	High-Throughput Data Analysis	3
	CECS-660	Introduction to Bioinformatics	3
	BIOC-545 -OR-	Advanced Biochemistry I	3
	MBIO-667	Graduate Cell Biology	3
	PHBI-750	Statistics for Bioinformatics	3
	PHBI-752	Statistical Genetics	3
	Subtotal		15
Degree Total			37

The student may be required to take one or more prerequisite courses for a required course if the student does not meet the prerequisites. These prerequisite courses become part of the program of study but are in addition to the number of coursework credit-hours presented above.

Electives

The student must take an elective from the following list. The student's program of study specifies the particular course to be taken.

Electives					
Emphasis*			*Course #*	*Course Title*	*Credit-Hours*
--	D	B			
x	x		PHBI-750	Statistics for Bioinformatics	3
x	x		PHBI-751	High-Throughput Data Analysis	3
x	x	x	PHST-682	Multivariate Analysis	3
x	x	x	PHST-711	Advanced Statistical Computing II	3
x	x	x	PHST-725	Design of Experiments	3
x	x	x	PHST-785	Nonlinear Regression	3
x	x		PHBI-752	Statistical Genetics	3
x			PHDA-705	Statistical Methods for Cost-Effectiveness Analysis	3
	x		PHST-724	Advanced Clinical Trials	3
	x	x	PHST-782	Generalized Linear Models	3
		x	PHST-691	Bayesian Statistics	3
		x	PHST-780	Advanced Nonparametrics	3
		x	CECS-632	Data Mining	3

*Key for emphasis: -- = no emphasis
                                D = emphasis on decision science
                                B = emphasis on bioinformatics

The student may be required to take one or more prerequisite courses for an elective course if the student does not meet the prerequisites. These prerequisite courses become part of the program of study but are in addition to the number of coursework credit-hours presented above.

Comprehensive Examination

Upon completion of the required coursework for the Ph.D. degree, a student is eligible to sit for the doctoral comprehensive examination. Each student must take a comprehensive examination generally administered over two days in August of each year. The Day 1 examination lasts for 5 hours and the Day 2 examination lasts for 8 hours with a lunch break in between.

- Day 1 covers the following topics:
  - Advanced Statistical Inference
  - Advanced Linear Models

- Day 2 covers the following topics, depending on the student's emphasis, if any:
  - No emphasis
    - Student choice of any two of the following:
      - Advanced Statistical Computing I
      - Advanced Clinical Trials
      - Generalized Linear Models
      - Advanced Survival Analysis
  - Emphasis on decision Science
    - Utility theory, assessment, and medical decision making
    - Student choice of one of the following:
      - Bayesian Statistics
      - Cost-Effectiveness Analysis
  - Emphasis on bioinformatics
    - Statistical methods in bioinformatics (including high-throughput methods) and statistical genetics
    - Student choice of one of the following:
      - Bayesian Statistics
      - Advanced Statistical Computing

The exam will be open book, open note. Cell phones, PDAs, Laptops or other personal electronic equipments will not be allowed. Grades on comprehensive examination will be "High Pass", "Pass", or "Fail". Note that a 'partial pass' is not an option. Students may make no more than two attempts to obtain a passing score on the comprehensive examination.

Dissertation

In order to complete the degree, a student must submit and successfully defend a dissertation on a topic approved by his or her major professor and the dissertation committee. Dissertation work may be started following successful completion of doctoral comprehensive examinations.

Dissertation Committee

The dissertation committee is formed by the student's proposing a major professor (or principal advisor) and four other committee members. The major professor must be a senior member of the Graduate Faculty; the other members of the committee must be members of the Graduate Faculty. One member of the dissertation committee must be external to the Department of Bioinformatics and Biostatistics. The committee is formally appointed by the dean of the Graduate School upon the recommendation of the chair of the department.

Dissertation Proposal (Pre-Dissertation Essay)

A dissertation proposal or pre-dissertation essay is submitted to the major professor and the dissertation committee. The proposal must be approved by a majority vote of the dissertation committee before the student undertakes further work on the dissertation.

The dissertation proposal is a typed document not exceeding 25 pages in length excluding topics (v) to (viii), below. The following formatting is used: Times New Roman 12-point font, margins of 1 inch on all sides and 1.5-line spacing throughout the body of the document. The Graduate School dissertation guidelines for citing references must be followed. The document is divided into the following sections and in the following sequence:

(i)   Introduction and Literature Reviews – general introduction to the area of proposed research and relevant literature reviews
(ii) Specific Aims and Significance – short section describing the specific aims of the proposed research and their potential importance in the field
(iii) Preliminary Results – summary of the research findings the student already has (e.g., simulation results) towards one or more of the specific aims. This is an important component of the proposal that demonstrates the feasibility of the proposed research by the student.
(iv) Research Plan – detailed description of the research towards the specific aims to be undertaken during the rest of the doctoral study period
(v)   References – complete references to all the cited literature. Journal names should not be abbreviated
(vi) Tables – including table headings
(vii) Figures – one figure per page
(viii) Appendix – copies (in PDF format) of published articles and preprints that are most relevant to the proposed research

Completing the Thesis or Dissertation

When students are ready to begin their dissertation or thesis work, they will need to register for PHDA 666 (if in the M.S. program) or PHDA 777 (if enrolled in the PhD program). Students submit a "Thesis/Dissertation Advisory Committee" form to the Graduate School, which can be attained from the Department of Bioinformatics and Biostatistics assistant or at http://graduate.louisville.edu/thesisdissforms.htm. This form requires the signatures of those faculty members who will serve on the student's thesis or dissertation committee. Students need to choose a Principal Advisor (i.e., Major Professor) and at least two other committee members (for a thesis committee) or four other committee members (for a dissertation committee). The Principal Advisor must be a Senior Member of the UofL Graduate Faculty, and the other members of your committee must be members of the Graduate Faculty. One member of the thesis or dissertation committee must be from another department at the University of Louisville.

Once students have completed their thesis or dissertation and are ready to defend, it is Department policy that all faculty and students of the Department of Bioinformatics and Biostatistics be invited to attend the defense presentation. **This defense shall be scheduled at the convenience of the members of your committee**.

The University of Louisville and the Graduate School have *very* specific rules regarding the format and presentation of thesis and dissertation submissions. Information on these rules can be found at www.graduate.louisville.edu Students will need to schedule the thesis or dissertation defense day and time with your committee members. Students need to submit a "Thesis/Dissertation Final Oral Examination Schedule" form to the Graduate School no later than two weeks before the scheduled date of the oral defense, which can be attained from the Department of Bioinformatics and Biostatistics assistant or at http://graduate.louisville.edu/thesisdissforms.htm Committee members should be given sufficient time to complete their reviews of students' thesis or dissertation, at least one week prior to the final oral defense.

Dissertation Approval

Following the presentation of the dissertation research, the dissertation committee schedules an oral examination of the candidate. All faculty and students of the school are invited to attend the presentation portion. However, the oral examination portion of the defense is open to dissertation committee members only. At the end of the examination a committee member has the option of approving or not approving the dissertation. The dissertation must be approved by the full committee before it is submitted to the Graduate School.

Dissertation Distribution

One unbound copy of the dissertation, signed by the dissertation committee members, must be deposited with the Graduate School before graduation. A copy of the final, signed dissertation must also be deposited with the department office.

Applying for Degree

Students are responsible for completing an "Application for Degree" form at the beginning of the semester in which they will defend their thesis or dissertation. These forms can be found at the Graduate School on Belknap Campus in either Jouett Hall or the Houchens Building, or can be obtained from the Department of Bioinformatics and Biostatistics assistant. The form must be submitted to the Graduate School by the due date posted for the respective graduation semester. Future deadline dates can be found on the Graduate Academic calendar at
http://www.louisville.edu/ur/onpi/infoctr/undergrad.htm .

For any questions or concerns students might have during the semester in which they plan to graduate in, students' best resource is the Graduate School. The Department of Bioinformatics and Biostatistics faculty and staff are also here to advise and assist you with any questions you might have.