

# **Biostatistics Education Programs**

## **Graduate Certificate and Master of Science**

### Student Handbook

### 2014-2015

Department of Public Health & Preventive Medicine  
Division of Biostatistics



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*Last update to this handbook: 9/18/2014*

## Welcome aboard!

This is an exciting time for the field of biostatistics. Today's interdisciplinary and translation research often produces complex data sets, the interpretation of which typically requires advanced training in biostatistics. Nationally, there is a shortage of biostatistics expertise at all levels, making it a very good time to pursue more advanced training in biostatistics. All faculty are here to help, guide, and accompany you on this exciting journey through the sea of Biostatistics study and will do our best for you to be successful wherever your training ultimately takes you.

## Our Biostatistics Education Programs

The **Biostatistics Graduate Certificate Program** is designed to provide basic to intermediate graduate level biostatistics trainings for a diverse range of students in health sciences. It is primarily aimed at those wishing to become more skilled applied biostatistics method. Graduates of the certificate program will be equipped with a well-rounded background in applied biostatistics and skills to:

- Perform a broad range of basic and intermediate level applied statistical procedures that are required in basic, clinical, population and translational sciences.
- Interpret and summarize analysis results in research reports and papers and communicate them to individuals with varying degrees of statistical knowledge.
- Conduct analyses for one's own research projects or provide support to collaborative research teams.

Our **MS in Biostatistics program** is designed to provide graduate level training in the application and theory of biostatistics. It is primarily aimed at those wishing to pursue career as an intermediate level biostatistician or apply for doctoral programs in Biostatistics. Our MS program is also appropriate for individuals who have earned a Graduate Certificate in Biostatistics and wish to pursue further training. The program will also be appropriate for some clinical and translational researchers (e.g. K awardees or postdoctoral trainees), students in other Oregon graduate programs, as well as working professionals throughout the state and region (e.g. public health practitioners, laboratory scientists, data managers, database programmers, other research professionals).

The MS in Biostatistics Program will produce high quality graduates wishing to pursue careers as intermediate level biostatisticians or apply for doctoral programs. These individuals will be equipped with a well-rounded background in both theoretical and applied biostatistics. Graduates of our program will be able to:

- Apply intermediate to advanced biostatistical theory and techniques to design, plan, and manage data collection to conduct analysis for student research projects or collaborative research teams.
- Translate broad research goals into specifications and procedures for statistical analysis and interpretation of results in basic, clinical, translational, and public health research studies.
- Select and use appropriate statistical analysis software for assessment, decision-making, and information-sharing (e.g., Stata, SAS, R, or other special programs).
- Communicate statistical methods and findings clearly and unambiguously to specialists and non-specialist audiences.

# Graduate Certificate in Biostatistics Program Requirements (30 credits total)

## Required courses:

(18 credits total)

- BSTA 511 Estimation and Hypothesis Testing for Applied Biostatistics – 4 credits
- BSTA 512 Linear Models – 4 credits
- BSTA 513 Categorical Data Analysis – 4 credits
- BSTA 514 Survival Analysis – 3 credits **OR** BSTA 519 Applied Longitudinal Data Analysis - 3 credits
- BSTA 510 Biostatistics Lab – 3 credits (taken in the same quarter)

## Electives

An additional 12 elective credits can be taken from the following:

- BSTA 500 Reading and Research in Biostatistics
- BSTA 504 Topics in Biostatistics - 3 credits
- BSTA 515 Data Management and Analysis in SAS – 3 credits
- *BSTA 514 Survival Analysis – 3 credits (If not taken as a required course as noted above, BSTA 514 can count as an elective.)*
- BSTA 516 Design and Analysis of Surveys – 3 credits (not offered in AY 2013-14)
- BSTA 517 Statistical Methods in Clinical Trials – 3 credits
- *BSTA 519 Applied Longitudinal Data Analysis (If not taken as a required course as noted above, BSTA 519 can count as an elective.) – 3 credits*
- BSTA 518 Spatial Data Analysis with Geographic Information Systems (GIS) – 3 credits (TBD in Summer 2014)
- PHPM 512 Epidemiology I – 4 credits
- PHPM 513 Epidemiology II (Methods) – 4 credits
- BMI 550 Computational Biology I – 4 credits
- BMI 551 Computational Biology II – 4 credits

# MS in Biostatistics Program Requirements (48 credits + comprehensive test)

## Required courses:

(33 credits)

- BSTA 511 Estimation and Hypothesis Testing for Applied Biostatistics – 4 credits
- BSTA 512 Linear Models – 4 credits
- BSTA 513 Categorical Data Analysis – 4 credits
- BSTA 514 Survival Analysis – 3 credits
- BSTA 519 Applied Longitudinal Data Analysis - 3 credits
- BSTA 510 Biostatistics Lab – 3 credits (taken in the same quarter)
- BSTA 550 Introduction to Probability - 3 credits
- BSTA 551 Mathematical Statistics I - 3 credits
- BSTA 552 Mathematical Statistics II - 3 credits
- BSTA 517 Statistical Methods in Clinical Trials – 3 credits

## Electives

(15 credits)

- BSTA 500 Reading and Research in Biostatistics
- BSTA 504 Topics in Biostatistics - 3 credits
- BSTA 515 Data Management and Analysis in SAS – 3 credits
- BSTA 516 Design and Analysis of Surveys – 3 credits (not offered in AY 2013-14)
- BSTA 518 Spatial Data Analysis with Geographic Information Systems (GIS) – 3 credits
- BSTA 521 Bayesian Methods for Data Analysis - 3 credits
- PHPM 512 Epidemiology I – 4 credits
- PHPM 513 Epidemiology II (Methods) – 4 credits
- BMI 550 Computational Biology I – 4 credits
- BMI 551 Computational Biology II – 4 credits
- PSU: Applied Probability 1 - 3 credits
- PSU: Applied Probability 2 - 3 credits
- PSU: Modern Nonparametric Statistics - 3 credits

## Academic Procedures and Policies

### Academic Advising:

Upon entering the biostatistics graduate program each student is assigned an advisor. The advisor's role is to help the student plan a course of study and answer questions about the program. In addition, it is recommended to attend group advising meetings in fall and spring quarter.

### Course Planning:

Please consult with your advisor if you'd like to review your planned schedule. We attempt to post the schedule for the entire academic year, but the course schedule is subject to change without notice and the elective offerings for each term are not truly finalized until a week or so before each term's registration period begins. Always refer to the most recent version of the schedule available on our website:

<http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/public-health/education-programs/courses-and-schedules/index.cfm>

### Registration:

Students register through the online ISIS system at <http://www.ohsu.edu/registrar/ISISOnline.htm>. Using this secure, interactive application, students may display grades and unofficial transcripts, view student account information, review any holds, view and/or print class schedules, and register for classes. Instructions are provided on the ISIS website. Detailed registration instructions are found on the website:

<http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/public-health/education-programs/courses-and-schedules/course-registration.cfm>

If you have problems or questions regarding registration, contact our Education Coordinator, Natalie Chin, at [phpm@ohsu.edu](mailto:phpm@ohsu.edu).

### Academic Calendar:

The academic calendar is maintained by the Registrar's Office, and it is the student's responsibility to take note of registration periods and deadlines. The calendar can be found here:

<http://www.ohsu.edu/xd/education/student-services/registrar/registrar-forms/index.cfm>

### Tuition and Financial Aid:

Tuition and fees are updated annually and posted on the Registrar's website:

<http://www.ohsu.edu/xd/education/student-services/registrar/registrar-forms/index.cfm>

Students must be enrolled in at least 5 credits to get financial aid.

Financial aid applications can be made through the OHSU [Office of Student Financial Aid](#). Assistantships are occasionally available for department grants, and applicants who have completed the Biostatistics

series are preferred candidates. Research assistant positions are posted on the OHSU Jobs web page and occasionally through emails to the student listservs. Please note that these positions do not come with a tuition waiver, though some positions may be eligible for an employee tuition discount. Scholarship information is available on the department website.

**Grading and GPA Requirements:** Students are assigned letter grades for classes except for Biostatistics Lab which is graded “pass/fail.” Pluses and minuses may be assigned, with the exception of “A+.”

All students must maintain a 3.0 GPA. Students may not receive lower than a B- in any course. If lower than a B- is received, the student will need to repeat the course with the permission of the instructor as well as permission from either Director Jodi Lapidus or co-Director Dongseok Choi. Students are not permitted to progress through the BSTA 511-513 sequence unless they achieve at least a B- in each of the classes.

### **Incomplete grades:**

Incomplete grades (“I”) are strongly discouraged in the Biostatistics program. If you need to take an Incomplete grade in a course for serious unforeseen personal or professional reasons, you should be aware that the Biostatistics program strictly adheres to the university policy noted below.

An instructor may assign a student an “I” grade when *all* of the following four criteria apply:

- i. Quality of work in the course up to that point is “B-” level or above.
- ii. Essential work remains to be done. “Essential” means that a grade for the course could not be assigned without dropping one or more grade points below the level achievable upon completion of the work.
- iii. Reasons for assigning an “I” must be acceptable to the instructor. The student does not have the right to demand an “I.”
- iv. The circumstances must be unforeseen or be beyond the control of the student. An instructor is entitled to insist on appropriate medical or other documentation.

In no case is an “Incomplete” given to enable a student to do additional work to raise a deficient grade.

**All incompletes must be resolved by the end of the subsequent term or they will be converted to an F by the Registrar’s Office. It is the student’s responsibility to make sure the instructor has submitted a Removal of Incomplete form to the PHPM Education Office at least 24 hours before the end of the term.** Contact Education Assistant Natalie Chin at [phpm@ohsu.edu](mailto:phpm@ohsu.edu) for assistance. An Incomplete Agreement must be on file in the PHPM Education Office.

## **Transfer Courses:**

If students took graduate biostatistics courses here or at another university and the courses were not applied toward any degree, we may be able to transfer some or all of them into the certificate, with program approval, depending on how old they are. (According to the University By-Laws, up to 20 credits for the MS and up to 12 credits for the Certificate can be transferred, provided the courses are not more than 7 years old at the time of graduation from OHSU). Only classes with grades of B and better can be transferred to our biostatistics programs.

Students enrolled in the MPH degree program at OHSU may apply the core Biostatistics series (BSTA 511, BSTA 512, and BSTA 513) to both the MPH and any of the Biostatistics graduate programs. These are the only biostatistics courses approved to count toward both the certificate and another degree program. For example, if an MPH student takes the required course Survival Analysis and applies it to their MPH degree, it cannot also count toward the MS degree or the Biostatistics certificate. Other courses would need to be taken to reach the required credits for each program.

All transfer paperwork must be filed by the end of the student's first term in the program. Please contact [phpm@ohsu.edu](mailto:phpm@ohsu.edu) for assistance or questions regarding transferring courses.

## **Course Waivers:**

It is understood that some students may have already completed a graduate course that appears to be duplicative of a required certificate course. In such cases, students may petition to waive the requirement to take a specific required course; however, students will still need to take the required number of credit hours for graduation.

For this waiver to be granted, the following guidelines are to be followed:

- Courses must address the learning competencies of the course.
- Courses must be at the graduate or professional program level.
- Courses must be comparable to, or exceed, the credit hours of the Biostatistics Certificate course.
- Courses must have been taken within the last 5 academic years and the grade earned must be the equivalent of a B or better.
- Requests must be accompanied by a copy of the course syllabus or equivalent official detailed description.
- All waivers must be approved by both the Biostatistics Education Program Director and the course instructor who will determine comparability of the previous course with the required certificate course.

*A waiver of a required course applies only to the course requirement; it does not apply to waiver of credit hours to complete the program of study toward the MS or the Graduate Certificate in Biostatistics.*

Procedure: Students requesting course waivers need to demonstrate the comparability of their previous course to the course instructor. To request waiver, students must provide a copy of the course syllabus

of the equivalent course, a transcript for the course, and any other appropriate supporting documentation to [phpm@ohsu.edu](mailto:phpm@ohsu.edu).

### **Leave of Absence & Continuous Enrollment Policies:**

Policy: A student in good standing may petition for a leave of absence. The cumulative amount of leave may not exceed 4 terms. Leave of absence status assures the student a continuation of admission in the program during the period of the leave of absence. A leave of absence is granted only to students in good standing and may, with program approval, constitute a waiver of the time limit for the completion of the graduate degree. Students who fail to return to the graduate program within 12 months of initiating a leave of absence will be administratively withdrawn from the program. Students on an approved leave of absence do not register for courses and are not required to pay instructional or other fees. Access to university or program facilities and services and use of faculty or staff time will be restricted.

Our program does not require enrollment during the summer, so if you are on an approved leave of absence that takes you through the summer term, the summer term will not count as part of your cumulative leave.

*Failure to register without an approved leave of absence will result in an administrative withdrawal of the student's admission to the program. Leave of Absence paperwork cannot be filed retroactively.*

**Petitioning for a Leave of Absence:** Students who are considering a leave of absence should complete the [withdrawal/leave of absence form](#) found on the Registrar's webpage and submit it to the Education Coordinator Natalie Chin prior to the start of the term of leave. There are many acceptable reasons for obtaining an LOA including medical leave for a physical or psychological issue, birth or adoption of a child less than six years of age, family obligations, research, additional graduate degree, military service, financial hardship, time to study for Boards, and other personal reasons.

The Leave request will include the written or verbal verification of circumstances.

- If the request to interrupt study temporarily is due to a physical or psychological illness, the medical or mental health professional that has been providing treatment to the student will, with the student's written consent, confirm in writing that a Leave is warranted due to the student's health condition. [Please see the Medical Leave of Absence instructions on the JBT Health Center's website.](#)
- For students called to active duty in the military, a copy of the dated notice of induction should accompany the LOA request.

**Returning from a Leave of Absence:** OHSU has a formal re-admittance procedure that students must complete before returning from Leave. Unless stated otherwise in school policy, a student will submit a letter of intent to return a minimum of 20 business days before the start of the next term. Students returning from a Leave should review the school-level policies on the readmission procedure, including application deadlines for financial aid.

Please refer to the [specific instructions from JBT Health](#) if you are returning from a Medical Leave of Absence.

A student is responsible for notifying the OHSU if plans change. The school may administratively withdraw a student from a program if a student does not return by the date provided on the Leave of Absence form.

The University will maintain the confidentiality of all information regarding LOAs in accordance with federal and state law. All records concerning Leaves of Absence are confidential and the official copy of such records shall be retained by the School in which the student was enrolled at the time of the Leave. Access to these records is limited by appropriate federal and state law.

## **Time to Degree Completion**

A student is entitled to take up to six years (18 terms, excluding summer term) to complete the Graduate Certificate or MS.

### **Actions to Take As You Approach Completion of Your Coursework for the Certificate or MS**

As you complete your coursework, record your classes in the appropriate course table found in Appendix I of this student handbook. It is good practice to meet with your faculty advisor at least once each academic year to review the courses that you have completed to that point, and to discuss the courses that you will be taking in the near future. You can use this table as the basis of your discussions with your faculty advisor.

In the term before your last term of classes, you must do the following:

1. Notify the Education Office ([phpm@ohsu.edu](mailto:phpm@ohsu.edu)) of your intention to complete your program's requirements;
2. Review your degree audit in ISIS to make sure the University's records is in agreement with your record of courses.
3. Submit the "Application for Degree" form found on the Registrar's web page:  
<http://www.ohsu.edu/xd/education/student-services/registrar/registrar-forms/index.cfm>

## **Master of Science Comprehensive Test**

A student's achievement of program-level competencies will be assessed by a comprehensive test. The test can be taken after completing all required courses or while taking the last few remaining courses. The exam will consist of in-class written test and data analysis in the computer lab. A comprehensive test committee will determine if the test has been passed. A student can take the exam one more time if the test is not passed the first time.

## Departmental Resources

### **Grand Rounds and Other Presentations:**

The Department of Public Health and Preventive Medicine presents a Grand Rounds lecture on various public health topics every third Thursday of each month from 12:00 to 1:00 PM. This lecture series is free and open to the public, and students are encouraged to attend. We hope you will join us—please see department homepage for event details at <http://www.ohsu.edu/public-health/>. Additional presentations may also be offered. Student thesis presentations are advertised and students are encouraged to attend. Announcements of special events are posted on the website and sent out to department listservs.

### **Computer Lab:**

Our computer lab, CSB 620, has 21 workstations loaded with statistical and Microsoft Office software that you can access 24 hours a day. Your badges will give you access to the building and the room. If you find that one of the computer workstations is not working, please contact Education Coordinator Natalie Chin for assistance so that she can place a work order request with our ITG department.

### **Student Lounge:**

The student lounge (room CSB 615) is near the computer lab and is also available 24/7 for group study and student meetings.

### **Student Mail and the Pick Up Bin:**

We have a student mail box and a “Pick-Up Bin” where instructors may leave your graded exams and projects. These are both in the Computer Lab. Your instructor will likely tell you when he or she has placed documents in the bin for you to pick up; however, it is your responsibility to periodically check the bin. Education Office staff do not monitor these boxes. We will discard all course materials after the 2<sup>nd</sup> week of the next term. We do not forward mail to home addresses due to the expense, so please do not use our mailing address for personal correspondence.

## Campus Resources

### Library:

The library is located in the BICC (see campus map on page 19). Access after 8pm requires an OHSU ID. You can also access electronic journal articles by logging into any OHSU workstation.

[www.ohsu.edu/library](http://www.ohsu.edu/library)

### Bookstore:

OHSU no longer has a physical book store and instead offers all books online:

<http://www.ohsu.edu/ohsubookstore/>. Most books can also be purchased with other online retailers.

The Education Office will post a book list on the Courses and Schedules page about a month before the term starts to allow students time to order their books before classes begin.

### Fitness and Sports Center:

In addition, the OHSU Fitness and Sports Center (March Wellness) offers a wide variety of fitness classes, equipment, and programs for students and fitness center members. Full-time OHSU students must present their student ID card with a current term sticker before being admitted to the building. Current stickers can be obtained at the Cashier's Office located in Baird Hall. For more information, please visit their website at <http://www.ohsu.edu/academic/acad/fsc/>.

### OHSU Parking and Transportation Services, (503) 494-8283:

Bus passes can be purchased at the Physical Plant where you picked up your ID badge. An annual pass is \$318 for TriMet and \$384 for C-Tran (as of 8/5/2014). A sticker will be affixed to your badge. If you wish to drive, please note that there is no student parking, so you will have to take your chances with the street parking. The fines for parking in the wrong locations are quite hefty. For more information on parking, buses, and active commuting/biking, please visit <http://www.ohsu.edu/parking/>.

### OHSU Email and H Drives:

Please be sure to check your OHSU email frequently, *even during the summer*, because this is the only email that the various OHSU programs will use to contact you. When you log in to an OHSU workstation, you will also have access to an *H Drive* which is your personal space on the OHSU servers. Please use it only for school-related storage, and be sure to back it up elsewhere prior to graduation. All accounts will be deleted after you graduate. You will receive instructions about how to log into your OHSU account via email before the term begins. If you ever have difficulty logging in, please contact ITG at 4-2222.

### Copying and Printing Services:

The OHSU Library provides fee-based copier access:

<http://www.ohsu.edu/xd/education/library/services/copying-and-printing-services.cfm>

### Course Evaluation System:

You will receive an automated notice to complete your course evaluations about one week before the end of the term. The evaluations are administered through Sakai, OHSU's online course management

tool to which all students receive access at the beginning of every term. When you receive the notice to complete your course evaluations, please do so as promptly as you can. We look at each and every evaluation on a quarterly basis, and student feedback is critical as we continue to evaluate and improve our curriculum and teaching. Please note that the evaluations are anonymous.

### **Purchasing statistical software:**

With your student ID, you can purchase educational software from any campus store if the store has it in stock. Here are your purchasing options for the programs used in OHSU biostatistics courses:

#### **Stata**

Stata/IC software license prices for students are \$98 (annual) or \$189 (perpetual). To order a copy for pick up at the university, contact StataCorp directly:

Phone: 800-782-8272 (Monday through Friday 8:00 to 5:00 Central Time)

Fax: 979-696-4601

Online: <http://www.stata.com/order/gradplan-sites/#oregon> (Ordering online is easiest!)

Be sure to include your OHSU.EDU email address when ordering. Once your order is processed, you will be contacted by a StataCorp sales person with campus pick up times and location. Typically, orders are available for pick up within 2 or 3 business days after the order is placed.

#### **SAS**

You can purchase SAS through the OHSU library: <http://www.ohsu.edu/xd/education/library/services/sas-software-licensing.cfm>. The cost for a single new license is \$225, a single license renewal is \$150, and installation CDs are available for \$60. The license is annual and will expire every November. You may also purchase through SAS directly: <http://www.sas.com/nextsteps/index.html>,

#### **SPSS**

Computers with SPSS software are available in CSB 620 (open 24 hours for OHSU students with student ID badges), the computer lab in SON (nursing students), the medical informatics computer lab (medical informatics students), and the OHSU library (hit and miss, ask at the information desk). If you would like to purchase a Grad Pack or Student Version, you will find copies at the [OHSU Campus Store](#).

#### **The R Project for Statistical Computing**

This is a very popular statistical language that is freely available for Windows, Mac, and Linux computers. ([www.r-project.org](http://www.r-project.org))

### **Other Resources:**

For more information about OHSU's various student services, please visit the Academic and Student Affairs website: <http://www.ohsu.edu/xd/education/student-services/>.

# Biostatistics Education Program Contact Information

## Biostatistics Faculty

### *Primary appointment with Division of Biostatistics:*

**Yiyi Chen, PhD**

**Assistant Professor**

Areas of interest: Design and analysis of clinical trials, Bayesian statistics

**Email:** [chenyiy@ohsu.edu](mailto:chenyiy@ohsu.edu)

**Phone #:** 503.346.0790

**Dongseok Choi, PhD**

**Professor**

Areas of interest: Big Data, statistical learning, high dimensional data, spatial statistics, GIS, time series

**Email:** [choid@ohsu.edu](mailto:choid@ohsu.edu)

**Phone #:** 503.494.5336

**Rochelle Fu, PhD**

**Associate Professor**

Areas of interest: Bayesian methods, meta-analysis, analysis of Medicare/Medicaid data

**Email:** [fur@ohsu.edu](mailto:fur@ohsu.edu)

**Phone #:** 503.494.6069

**Kenneth E. James, PhD**

**Professor Emeritus**

Areas of interest: Design, conduct and analysis of clinical trials

**Email:** [jamesk@ohsu.edu](mailto:jamesk@ohsu.edu)

**Michael R. Lasarev, MS**

**Instructor**

Areas of interest: Computational statistics, categorical data analysis

**Email:** [lasarevm@ohsu.edu](mailto:lasarevm@ohsu.edu)

**Jodi A. Lapidus, PhD**

**Professor**

Areas of interest: Categorical data, proteomics, biomarker studies, statistical methods for epidemiology, classification and prediction

**Email:** [lapidusj@ohsu.edu](mailto:lapidusj@ohsu.edu)

**Phone #:** 503.494.1167

**Eun Sul Lee, PhD**

**Adjunct Professor**

Areas of interest: Complex survey design and analysis, mental health research

**Email:** [leeeu@ohsu.edu](mailto:leeeu@ohsu.edu)

**Phone #:** 503.418.0490

**Shannon McWeeney, PhD**

**Professor**

Areas of interest: Statistical genetics, bioinformatics

**Email:** [mcweeney@ohsu.edu](mailto:mcweeney@ohsu.edu)

**Phone #:** 503.494.8347

**Jessica Minnier, PhD**

**Assistant Professor**

Areas of Interest: Risk prediction models, machine learning methods and statistical genetics

**Email:** [minnier@ohsu.edu](mailto:minnier@ohsu.edu)

**Phone #:** 503-494-3967

**Motomi Mori, PhD**

**Professor, Division Head**

Areas of interest: Oncology clinical trials, biomarker studies, analysis of high-throughput genetics, genomics data

**Email:** [morim@ohsu.edu](mailto:morim@ohsu.edu)

**Phone #:** 503.418.1555

**Thuan Nguyen, MD, PhD**  
**Assistant Professor**

Areas of interest: Mixed-effects models, model selection, longitudinal data

**Email:** [nguythua@ohsu.edu](mailto:nguythua@ohsu.edu)

**Phone #:** 503.494.3697

**Byung S. Park, PhD**

**Research Assistant Professor**

Areas of interest: General linear models, microarrays

**Email:** [parkb@ohsu.edu](mailto:parkb@ohsu.edu)

**Phone #:** 503.418.0127

**Dawn Peters, PhD**

**Associate Professor**

Areas of interest: Clinical trial methodology, randomization, clinical outcomes research

**Email:** [petersd@ohsu.edu](mailto:petersd@ohsu.edu)

**Phone #:** 503.494.8528

**Donald Pierce, PhD**

**Adjunct Professor**

Areas of interest: Biostatistics theory, radiation research, cohort study, statistical methods of epidemiology

**Email:** [pierced@ohsu.edu](mailto:pierced@ohsu.edu)

**Phone #:** 503.418.0492

***Joint appointment with Division of Biostatistics:***

**Xinbo Zhang, PhD**

**Research Assistant Professor, Department of Ophthalmology**

Areas of interest: Imaging, glaucoma

**Email:** [zhangxin@ohsu.edu](mailto:zhangxin@ohsu.edu)

**Phone #:** 503.494.3117

**Miguel Marino, PhD**

**Assistant Professor, Dept. of Family Medicine**

Areas of interest: High-dimensional correlated data, validation of new instruments, multivariate data

**Email:** [marinom@ohsu.edu](mailto:marinom@ohsu.edu)

**Phone #:** 503.494.3233

**David Yanez, PhD**

**Associate Professor**

Areas of interest: Correlated data, measurement error models, clinical trials, statistical methods of epidemiology, statistical consulting

**Email:** [yanezn@ohsu.edu](mailto:yanezn@ohsu.edu)

**Phone #:** 503-494-5354

## Key Administrative Contacts

For administrative issues related to Biostatistics Programs, please contact Education Coordinator [Natalie Chin](#) first.

**Jodi A. Lapidus, PhD**

**Director for Biostatistics Graduate Programs**

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**Phone #:** 503.494.1167

**Dongseok Choi, PhD**

**Co-Director for Biostatistics Graduate Programs**

**Email:** [choid@ohsu.edu](mailto:choid@ohsu.edu)

**Phone #:** 503.494.5336

**Natalie Chin**

**Education Coordinator**

**Phone #:** 503.494.1158

**Email:** [phpm@ohsu.edu](mailto:phpm@ohsu.edu)

*Other administrative contacts:*

**Thomas Becker, PhD**

**Chair**

**Email:** [beckert@ohsu.edu](mailto:beckert@ohsu.edu)

**Phone #:** 503.494.1175

**William Lambert, PhD**

**Education Director**

**Email:** [lambertw@ohsu.edu](mailto:lambertw@ohsu.edu)

**Phone #:** 503.494.9488

**Theresa (Tree) Casiano, MS**

**Education Manager**

**Email:** [trianot@ohsu.edu](mailto:trianot@ohsu.edu)

**Phone:** 503.494.2012

See our website for more information about [who's who in the Department of Public Health and Preventive Medicine](#).

**Mailing address:**

Oregon Health & Science University  
Department of Biostatistics  
3181 SW Sam Jackson Park Road  
Mail Code: CB 669  
Portland, Oregon 97239

**Physical address:**

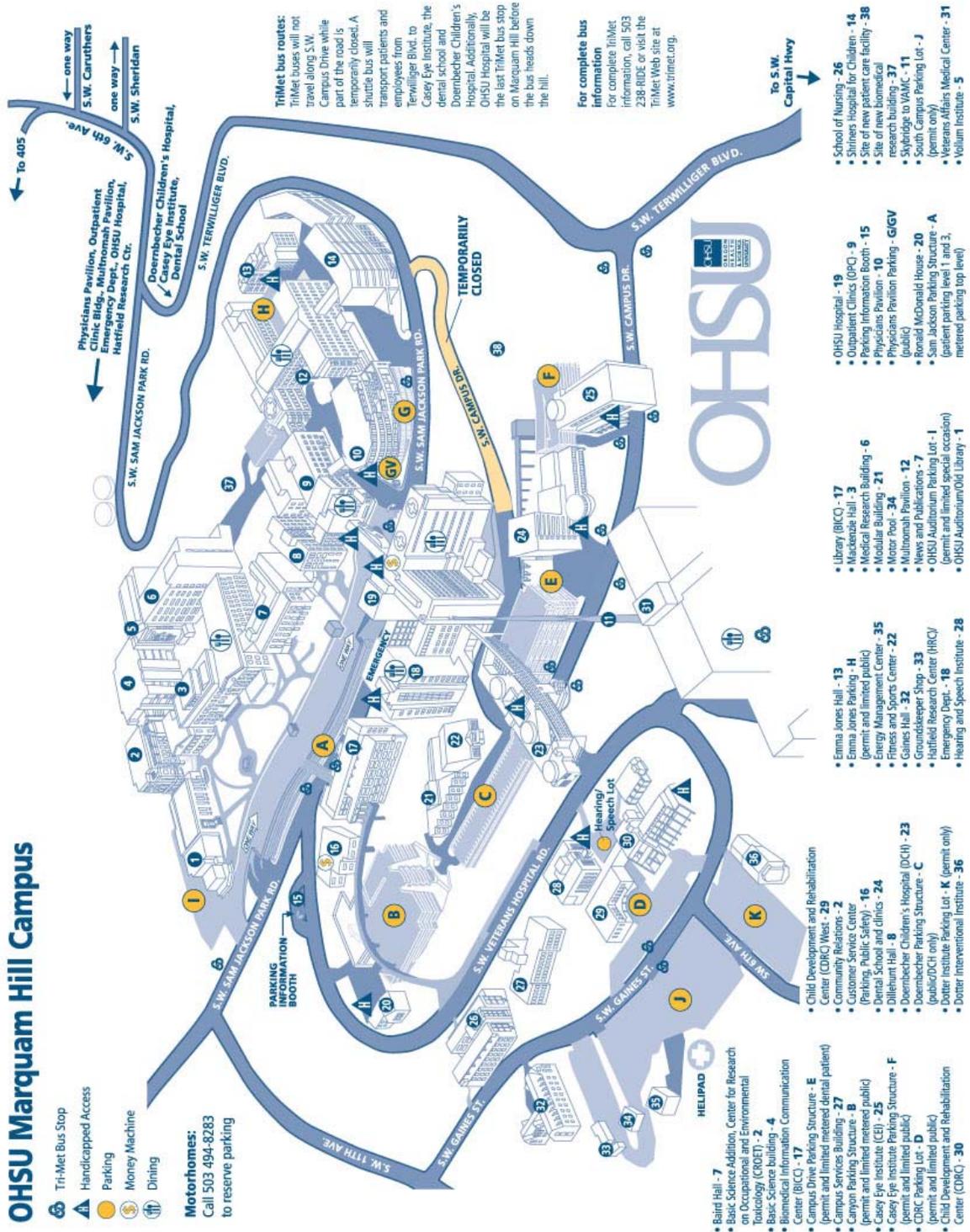
Campus Services Building  
3505 SW US Veterans Hospital Road  
Portland, Oregon 97239

Fax number: 503.494.4981

Office hours: Monday – Friday, 9:00 am to 4:30 pm

Department of Public Health and Preventive Medicine Education Office email: [phpm@ohsu.edu](mailto:phpm@ohsu.edu)

# OHSU Campus Map



**Campus map and location of classes** - Most of our classes are held in our conference room, CSB 679. Sometimes courses are held in the School of Nursing, which is right next door to the Campus Services building, or in Mac Hall, across campus. Several classes are held in UHS 8B60 (University Hospital, #6 on the map). The easiest way to get there from the Campus Services building is to exit the front of the building, make a right on SW Veterans hospital road and enter Doernbecher Children's hospital on your right (bldng #10). You will enter on floor #10. Head down the hall toward the elevators, and go down to floor 9. Make a left out of the elevators, continue down the hall and through the hospital lobby. You'll come to another set of elevators. Take them or the adjacent stairs down to the 8<sup>th</sup> floor. The class room will be right in front of the elevators.

## BIostatISTICS COURSE DESCRIPTIONS

In addition to the courses listed below, there may be courses offered through the School of Nursing, Department of Medical Informatics and Clinical Epidemiology, or other departments at OHSU or PSU that are appropriate electives. Please contact Dr. Jodi Lapidus before the term starts to obtain permission.

### **BSTA 500 Reading and Research in Biostatistics**

**Instructor(s):** various biostatistics faculty

**Credits:** 1 - 2

**Term Offered:** all terms

**Prerequisite:** permission of instructor

**Course Description:** The student and the instructor plan the course of study consistent with the student's interest and degree objectives.

### **BSTA 504 Topics in Biostatistics**

**Instructor(s):** various biostatistics faculty

**Credits:** 1 - 3

**Term Offered:** all terms

**Course Description:** The topics will vary year to year.

### **BSTA 510 Biostatistics Lab**

**Instructor:** Dongseok Choi, PhD

**Credits:** 3

**Term Offered:** all terms

**Pre-requisite:** BSTA 512 or consent of instructor.

**Course Description:** The course provides hands-on data analysis and/or biostatistical consulting experience to students outside classroom settings. Students will have opportunities to perform data analysis with inputs from faculty members. Students should have adequate skills in at least one statistical program among STATA, SAS or R and has finished BSTA 512 Linear Models or equivalent. Students meet weekly for 1 hour with the course instructor for discussion on their projects and are also encouraged to have regular meetings with an assigned faculty advisor and/or consultee(s). Students are expected to work individually or in a team of 2~3 on actual data analysis. The workload will be at least 9 hours per week including all activities (classes, meetings, readings, coding, and analysis).

### **BSTA 511 Estimation and Hypothesis Testing in Applied Biostatistics**

**Instructor(s):** Mike Lasarev, MS

**Credits:** 4

**Term Offered:** Fall

**Prerequisite:** admission to the Epi/Biostat MPH or the Biostatistics Certificate/MS/MBST program and one undergraduate statistics course; others with departmental approval

**Course Description:** This course is designed for students in the Epidemiology & Biostatistics track of the Oregon MPH program, the Graduate Certificate/MS/MBST in Biostatistics, and others who will go on to take BSTA 512 and BSTA 513. A broad range of topics in probability, distribution, estimation and hypothesis testing will be covered. These will be followed by nonparametric methods and simple methods for categorical data. In addition, one-way analysis of variance (ANOVA) and correlation and simple linear regression will be covered. Most homework will require using statistical software (Stata).

### **BSTA 512 Linear Models**

**Instructor(s):** Thuan Nguyen, MD, PHD

**Credits:** 4

**Term Offered:** Winter

**Prerequisite:** A grade of B- or better in BSTA 511

**Course Description:** This course is the second course in the required sequence for the Epi/Biostat track in the Oregon MPH program and the Graduate Certificate in Biostatistics. In this course, students will focus on *linear models* that include Regression Analysis and Analysis of Variance (ANOVA). In conjunction with the conceptual and theoretical developments, homework assignments and data analysis projects will be assigned in supporting the topics.

### **BSTA 513 Categorical Data Analysis**

**Instructor(s):** Yiyi Chen, PhD

**Credits:** 4

**Term Offered:** Spring

**Prerequisite:** A grade of B- or better in BSTA 512

**Course Description:** Biostatistics III is the third course in the required sequence for the Epi/Biostat track in the Oregon MPH program and the Graduate Certificate in Biostatistics. This course covers topics in categorical data analysis such as cross tabulation statistics, statistics for matched samples, and methods to assess confounding and interaction via stratified tables. It will also explore logistic regression in detail, and relate results back to those found with stratified analyses. Similar to linear regression in Biostatistics 2, topics for logistic regression will include parameter interpretation, statistical adjustment, variable selection techniques and model fit assessment. If time allows, students will have the opportunity to briefly explore other analysis methods. Most homework assignments for this course are to be completed using statistical software.

### **BSTA 514 Survival Analysis**

**Instructor(s):** TBA

**Credits:** 3

**Term Offered:** TBD

**Prerequisite** BSTA 512 or consent of instructor

**Course Description:** Analysis of survival time data using parametric and nonparametric methods for estimation, hypothesis testing, and regression methods for censored data with covariates. In

addition to the traditional parametric models such as the Weibull and log-normal, the Kaplan-Meier (empirical) estimate of the survival function and the Cox proportional hazards regression model are studied in detail. Determination of power and sample size calculations will be covered. This course is cross listed with STAT 578 in Mathematics and Statistics at PSU.

### **BSTA 515 Data Management and Analysis in SAS**

**Instructor(s):** Xinbo Zhang, PhD

**Credits:** 3

**Term Offered:** Fall

**Prerequisite** BSTA 511 or equivalent or consent of instructor

**Course Description:** This course is designed for students who want to develop and expand their skills in data management, statistical analyses and graphics for real world applications using SAS. After brief introduction, the course will cover intermediate to early advanced level programming skills in SAS. The class will be taught in a computer lab in order to give the student hands-on experience using SAS to manage data, perform analyses and produce graphs. Class sessions and homework will be oriented around particular data management and analysis tasks. Health-related data sets will be provided for students to use. This course could be extremely helpful in preparation for research projects.

### **BSTA 516 Design and Analysis of Surveys**

**Instructor:** Dongseok Choi, PhD and Eun Sul Lee, PhD

**Credits:** 3

**Prerequisite:** BSTA 511 or consent of instructor

**Term Offered:** Spring

**Course Description:** This course is designed to introduce basic concepts, techniques, and current practice of sample survey design and analysis with emphasis on community health surveys. Topics in design include simple random sampling, systematic sampling, stratified random sampling, cluster sampling, multistage sampling, and replicated sampling. Examples of complex designs will be drawn from telephone surveys, the Current Population Survey and various health surveys of National Center for Health Statistics. Topics in analysis include post-stratification adjustments, ratio and regression estimators, and methods for estimating variance from complex surveys. To illustrate the current practice of survey analysis, selected data from National Health and Nutrition Examination Survey will be analyzed using STATA.

### **BSTA 517 Statistical Methods in Clinical Trials**

**Instructor(s):** Yiyi Chen, PhD

**Credits:** 3

**Term Offered:** TBD

**Prerequisite:** BSTA 512 Linear Models or consent of instructor

**Course Description:** This course is designed for students who are interested in learning design and analysis of clinical trials. Starting with a brief introduction to the four phases of clinical trials, the

course will cover the most widely used sing-stage and two-stage trial designs. Sample size computations associated with major designs, methods of randomization and blinding, and analysis methods for different designs and endpoints will all be introduced. Towards the end of the course there will be several advanced topics overview sessions such as Bayesian methods in clinical trials, adaptive clinical trial design, designs for cancer clinical trials, etc. These special topics sessions will be open to wider audiences not necessarily enrolled in the program (e.g. clinical researchers from OHSU Knight Cancer Institute or OCTRI, or interested faculty from OHSU departments). Guest lecturers may be invited to some of the sessions. In addition to homework assignments, students will form groups and work on class project under the supervision of the instructor.

### **BSTA 518 Spatial Data Analysis with GIS**

**Instructor(s):** Dongseok Choi, PhD

**Credits:** 3

**Term Offered:** Summer

**Prerequisite:** BSTA 512 or consent of instructor

**Course Description:** This course is designed for students in Biostatistics Certificate Program, the Epidemiology & Biostatistics track of the Oregon MPH program, and others who are interested in GIS/Spatial Statistics applications for environmental and health related research. Geographic information system (GIS) software is a powerful tool for assessment, decision-making, and information sharing. GIS provides a platform for the analysis of health data in relationship to population demographics, socioeconomic factors, surrounding social and health services, and the natural environment. The course will also cover basic statistical methods for the analysis of spatial data such as kriging and spatial clustering. The class will be taught in a computer lab and students are required to do a course project with a data set throughout the quarter under the supervision of the instructor.

### **BSTA 519 Applied Longitudinal Data Analysis**

**Instructor(s):** Rochelle Fu, PhD

**Credits:** 3

**Term Offered:** Winter

**Prerequisite:** BSTA511 (or equivalent), BSTA 512 (or equivalent), and BSTA 513 (or equivalent), or permission of the instructor

**Course Description:** This course is a required course for students in the Master programs and Graduate Certificate program in Biostatistics and could also be used as an elective course for students in Epi/Biostat track in the Oregon MPH program and other programs. This course is designed for students who have taken the basic applied statistical courses and wish to learn the more advanced statistical methods for longitudinal data. Longitudinal data consist of measurements of predictor and response variables at two or more points in time for many individuals. This course covers the statistical properties of longitudinal data and special challenges due to the repeated measurements on each individual, exploratory methods and statistical models for longitudinal data. For statistical methods, the course will briefly cover the more traditional repeated measure analysis

of variance (ANOVA) approach for continuous data, and focus more on mixed model approach and estimation based on generalized estimating equation. Real life examples from either instructors' experience and/or the health sciences literature will be used to explain the concept and application of these models by using continuous, binary and count data. Homework assignments and final class project play a central role to understand and appropriately apply the methods covered in the course.

### **BSTA 521 Bayesian Methods for Data Analysis**

**Instructor:** Rochelle Fu, PhD

**Credits:** 3

**Term Offered:** Spring

**Prerequisite:** BSTA 511, BSTA 550, and BSTA 551 or consent of instructor

**Course Description:** Different from other courses in the M.S. program, which are based on the “frequentist” method of statistical reasoning, where probability is understood to be a long run frequency of a “repeatable” event, Bayesian methods are based on a different philosophy and enable one to combine information from previous similar and independent studies (prior information), with information from a new study to make updated inference for model parameters. This course will first introduce the concept of Bayesian analysis from the perspective of medical research, review Bayes’ rule and basic probability distributions. Then the course will cover basics of Bayesian inference, prior determination, Bayesian computation, model criticism and selection. All concepts will be illustrated using real-life examples from biomedical research. The course will also teach students how to use the statistical packages for Bayesian analysis, for example, WinBUGS/OpenBUGS/BRugs, which will be used for homework and the final class project.

### **BSTA 550 Introduction to Probability**

**Instructor(s):** Dongseok Choi, PhD

**Credits:** 3

**Term Offered:** Fall

**Prerequisite:** BSTA 512 (or equivalent) or permission of instructor

**Course Description:** This course is designed to introduce history, concepts, and distributions in probability, Monte Carlo simulation techniques, and Markov chains. Students will also learn how to write R codes for various statistical computations and plots. Previous experience in R is not required. R is free software available from <http://www.r-project.org>.

### **BSTA 551 Mathematical Statistics I**

**Instructor(s):** Dawn Peters, PhD

**Credits:** 3

**Term Offered:** Winter

**Prerequisite:** differential and integral calculus and BSTA 550 Introduction to Probability

**Course Description:** The objectives of the two term sequence are to (1) provide students with fundamental principles for conducting statistical inference both via estimation and hypothesis

testing and (2) develop the mathematical skills for applying these principles in new situations. In the first term we focus on principles of data reduction and estimation, but will also introduce hypothesis testing if time permits.

### **BSTA 552 Mathematical Statistics II**

**Instructor(s):** Dawn Peters, PhD

**Credits:** 3

**Term Offered:** Spring

**Prerequisite:** BSTA 551 Mathematical Statistics I

**Course Description:** The second course in this two-course sequence focuses on hypothesis testing, interval estimation, and asymptotic results.

### **PHPM 512 Epidemiology I**

**Credits:** 4

**Offering:** Fall

**Prerequisite:** admission to the MPH program or Biostatistics Certificate program and previous or concurrent registration in BSTA 511 or comparable biostatistics course

**Course Description:** Basic epidemiological principles applicable to infectious and non-infectious diseases, host-agent-environmental relationships, and concepts of disease causation will be reviewed. Students will gain familiarity with epidemiologic measures such as incidence, prevalence, mortality, natality, case fatality, relative risk and other rates and ratios and will use age-adjustment and other standardization techniques. Types and sources of public health data will be reviewed, their use in comparing groups, and statistical significance. Epidemic curves, outbreak investigation principles, surveillance concepts and basic designs of observational studies and sources of bias will be covered.

### **PHPM 513 Epidemiology II: Methods**

**Credits:** 4

**Offering:** Winter

**Prerequisite:** PHPM 512 and BSTA 511

**Course Description:** Students will develop skills in recognizing strengths and weaknesses of various epidemiologic study designs; describing sources of bias that can distort measures of effect/association; and designing case-control studies, cohort studies, and randomized clinical trials. The class will also explore additional study designs used less frequently, such as nested case-control studies and case-crossover studies. Students will gain experience in recognizing and evaluating the role of confounding in data derived from epidemiologic studies. Additional tutorial sessions, to be scheduled at a time convenient for the students, will include problem-solving exercises focused on study design and analysis. Written homework assignments and problem-oriented learning will occupy a central role in facilitating mastery of epidemiologic methods and issues.

## **BMI 550/650 Bioinformatics and Computational Biology I: Algorithms**

**Credits:** 4

Note: 4 credits includes 1 credit Lab

**Offering:** On Campus: Fall

**Prerequisite:** A previous course in algorithms (recommended).

**Course Description:** The course will be a problem-driven examination of the algorithmic issues in computational biology. The course will provide students with the computational fundamentals underlying the techniques covered. Students will be expected to learn basic algorithm principles, basic mathematical and statistical proofs, and molecular biology. The emphasis is on algorithm development and application to biological problems, particularly those from functional genomics studies. Topics will include: Mapping (Genetic linkage maps, physical maps), Sequencing (Whole genome sequencing: shotgun approaches and ESTs), Sequence analysis (multiple sequence alignment, fragment assembly, EST assembly, genome annotation, algorithmic side of gene finding and BLAST). Students will be evaluated on written assignments and a programming project.

## **BMI 551/651 Bioinformatics and Computational Biology II: Statistical Methods**

**Credits:** 4

Note: 4 credits includes 1 credit Lab

**Prerequisite:** BMI 550

**Offering:** On Campus: Winter

**Course Description:** This course will be a problem-driven examination of the quantitative issues in computational biology. The course will provide students with the statistical fundamentals underlying the techniques covered. Topics will include applications involving MCMC Models, Maximum Likelihood, Random Walks, Hidden Markov Models, Estimating Genealogical Relationships and Networks. Students will be evaluated on written assignments and a programming project.

## Appendix I: Course Matrices

<b>GRADAUTE CERTIFICATE IN BIOSTATISTICS - 30 credits total</b>			
<b>Required Courses - 18 credits</b>		<b>Credits</b>	<b>Term Offered</b>
	BSTA 510 Biostatistics Lab	<b>3</b>	all
	BSTA 511 Estimation and Hypothesis Testing for Applied Biostatistics (PHPM 525 Biostatistics I)	<b>4</b>	Fall
	BSTA 512 Linear Models (PHPM 526 Biostatistics II)	<b>4</b>	Winter
	BSTA 513 Categorical Data Analysis (PHPM 527 Biostatistics III)	<b>4</b>	Spring
	BSTA 514 Survival Analysis <b>-OR-</b> BSTA 519 Applied Longitudinal Data Analysis	<b>3</b>	varies
<b>Elective Courses - 12 credits chosen from the courses below</b>			
	BSTA 500 Reading and Research in Biostatistics	<b>1-3</b>	varies
	BSTA 504 Topics in Biostatistics	<b>3</b>	varies
	BSTA 514 Survival Analysis (If not taken as a required course as noted above, BSTA 514 can count as an elective.)	<b>3</b>	TBD
	BSTA 515 Data Management and Analysis in SAS	<b>3</b>	Fall
	BSTA 516 Design and Analysis of Surveys	<b>3</b>	Spring
	BSTA 517 Statistical Methods in Clinical Trials	<b>3</b>	Spring
	BSTA 518 Spatial Data Analysis with Geographic Information Systems (GIS)	<b>3</b>	Summer (not offered every year)
	BSTA 519 Applied Longitudinal Data Analysis (If not taken as a required course as noted above, BSTA 519 can count as an elective.)	<b>3</b>	Winter
	PHPM 512 Epidemiology I	<b>4</b>	Fall
	PHPM 513 Epidemiology II	<b>4</b>	Winter
	BMI 550 Computational Biology I	<b>4</b>	Fall
	BMI 551 Computational Biology II	<b>4</b>	Winter
	Other electives must be approved by the Program Director, Dr. Jodi Lapidus.		

<b>Master of Science - 48 credits total</b>				
<b>Required Courses - 33 credits</b>			<b>Credits</b>	<b>Term Offered</b>
	BSTA 510 Biostatistics Lab		3	all
	BSTA 511 Estimation and Hypothesis Testing for Applied Biostatistics		4	Fall
	BSTA 512 Linear Models		4	Winter
	BSTA 513 Categorical Data Analysis		4	Spring
	BSTA 514 Survival Analysis		3	varies
	BSTA 517 Statistical Methods in Clinical Trials		3	Winter
	BSTA 519 Applied Longitudinal Data Analysis		3	Winter
	BSTA 550 Introduction to Probability		3	Fall
	BTA 551 Mathematical Statistics I		3	Winter
	BSTA 552 Mathematical Statistics II		3	Spring
<b>Elective Courses - 18 credits chosen from the courses below</b>				
	BSTA 500 Reading and Research in Biostatistics		1-2	varies
	BSTA 504 Topics in Biostatistics		3	varies
	BSTA 515 Data Management and Analysis in SAS		3	Fall
	BSTA 516 Design and Analysis of Surveys		3	Spring
	BSTA 518 Spatial Data Analysis with Geographic Information Systems (GIS)		3	Summer (not offered every year)
	BSTA 521 Bayesian Methods for Data Analysis		3	Spring
	PHPM 512 Epidemiology I		4	Fall
	PHPM 513 Epidemiology II		4	Winter
	BMI 550 Computational Biology I		4	Fall
	BMI 551 Computational Biology II		4	Winter
	PSU: Applied Probability 1		3	TBD
	PSU: Applied Probability 2		3	TBD
	PSU: Modern Nonparametric Statistics		3	TBD