Oregon Health & Science University
Department of Medical Informatics & Clinical Epidemiology

BMI 562/662: Quantitative Research Methods
3.0 credits
Spring, 2015

Mondays 9:00AM-11:50AM
CHH 3172 Room 3*

Instructors:

Annette Totten, PhD
Email: totten@ohsu.edu
Office: BICC 529
Office hours: Monday before class (by appointment), Thursday 10:00-11:30AM; or other
times by appointment

Jamie Eastman, PhD
Email: eastmaja@ohsu.edu
Office: SJH 4127
Office hours: Mondays from 1:00PM-3:00PM, Wednesdays from 9:00AM-11:00AM or
by appointment.

Required Textbook(s)
None. Class notes and articles for each week will be provided

Prerequisites
Prior statistics: PHPM 524 or (BSTA 511 and 512) or (HIP 511 and 512) AND BMI 560
Design and Evaluation in Health Informatics; or consent of instructor.

Course Description
The goal of this course is to expand on previous biostatistics and research methods
courses. The emphasis will be on applying knowledge of statistical tests and analysis
methods to real world informatics problems. Students will be expected to develop an
understanding of the strengths and limitations of different analytic approaches, as well as
the types of questions they can answer. The goal is to prepare students to take a research
idea and identify analysis methods that are best suited for coming to a solid conclusion.

Course Coordination
Class sessions will focus on applying the methods presented in course readings and
materials students will review before class and which will be summarized at the
beginning of each session. Students will be expected to come prepared and ready to
apply the knowledge they have gained to a real world situation. Quizzes and surveys will
be online and completed ahead of class to help students and instructors identify areas of
weakness and lack of understanding.
Some work outside of class will involve online activities and 1-2 sessions may be conducted online. Course activities will include students leading a discussion around the assigned journal articles, as though leading an actual journal club. The assigned leaders will be responsible for choosing articles for discussion (subject to approval by the instructors).

**Grading**

**Assignments**

Your final grade for this course will be made up of a number of factors. Detailed information about each assessment, including grading rubrics, will be made available on the course website and through in-class handouts. While grades are not based solely on any individual component, students who excel in all aspects will likely receive higher grades than those who focus on only one or two components. The weighting of the various assignments will be as follow:

- Participation: 20%
- Journal Club: 30%
- Quizzes and Surveys: 10%
- Final Project: 40%

**Grading Scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93 - 100%</td>
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<tr>
<td>A-</td>
<td>90 - 92.9%</td>
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<tr>
<td>B+</td>
<td>87 - 87.9%</td>
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<tr>
<td>B</td>
<td>83 - 86.9%</td>
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<tr>
<td>B-</td>
<td>80 - 82.9%</td>
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<tr>
<td>C+</td>
<td>77 - 79.9%</td>
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<tr>
<td>C</td>
<td>73 - 76.9%</td>
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<tr>
<td>C-</td>
<td>70 - 72.9%</td>
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<tr>
<td>F</td>
<td>&lt;70%</td>
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**Late Assignment Policy**

Late work will not be accepted unless previous arrangements have been made with the course instructors.

Graduate Studies in the OHSU School of Medicine is committed to providing grades to students in a timely manner. Course instructors will provide students with information in writing at the beginning of each course that describes the grading policies and procedures including but not limited to evaluation criteria, expected time needed to grade individual student examinations and type of feedback they will provide.

Class grades are due to the Registrar by the Friday following the week of finals. However, on those occasions when a grade has not been submitted by the deadline, the following procedure shall be followed:

1. The Department\(^1\) /Program Coordinator\(^2\) will immediately contact the Instructor requesting the missing grade, with a copy to the Program Director and Registrar.
2) If the grade is still overdue by the end of next week, the Department¹/Program Coordinator² will email the Department Chair directly, with a copy to the Instructor and Program Director requesting resolution of the missing grade.

3) If, after an additional week the grade is still outstanding, the student or Department¹/Program Coordinator² may petition the Office of Graduate students for final resolution.

¹ For courses that are run by a specific department.
² For the conjoined courses (course number is preceded by CON_ that are run by Graduate Studies.

Academic Honesty
Academic honesty is required in order to pass this course. Students are encouraged to help each other understand the material; however homework assignments, papers, projects and examinations must be the work of the individual student. It is acceptable and even encouraged to discuss general privacy and security issues and computer science concepts; however, there should be no sharing of actual answers for the homework exercises. The Professional Conduct Policy of the Graduate Studies Program is available from on campus at http://ozone.ohsu.edu/som/faculty/docs/graduatecouncil/profconductpolicy.pdf or on the departmental web site.

Student Access
OHSU is committed to providing equal access to qualified students with disabilities. Student Access determines and facilitates reasonable accommodations, including academic adjustments and auxiliary aids, for students with documented disabilities. A qualified student with a disability is a person who meets the academic and technical standards requisite to admission or participation in a particular program of study. As defined by the Americans with Disability Act (ADA), a person with a disability has a physical or mental impairment that substantially limits one or more major life activities of the individual. This may include, but is not limited to, physical conditions, chronic health issues, sensory impairments, mental health conditions, learning disabilities and ADHD. Student Access works with students with disabilities from all of OHSU’s educational programs and at each campus.

Each school has an assigned Program Accommodation Liaison (PAL), who acts as an “in-house” resource for students and faculty concerning access issues for students with disabilities. The PAL works in collaboration with Student Access to implement recommended accommodations for students with disabilities.

It is recommended that you contact Student Access to consult about possible accommodations if you a) received disability accommodations in the past, b) begin experiencing academic difficulties, and/or c) are given a new diagnosis from your healthcare provider.

Learn more about Student Access:
Phone: 503 494-0082
Email: studentaccess@ohsu.edu
Website: www.ohsu.edu/student-access
Copyright Information
Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept online for student access. Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.
To comply with the fair use doctrine of the US copyright law, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time as you will have no further access to your courses.

Use of Sakai: This course will have an online component, which can be accessed through Sakai, OHSU’s online course management system. For any technical questions or if you need help logging in, please contact the Sakai Help Desk.
Sakai Help Desk is available:
Mon – Fri, 8 am – 9 pm
Weekends, 12 pm – 5 pm
Contact Information:
(Toll-free) 877-972-5249
(Web) http://atech.ohsu.edu/help
(Email) sakai@ohsu.edu

DMICE Communication Policy
1. If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.
2. If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at doctord@ohsu.edu.
3. If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at doctord@ohsu.edu and cc the instructor and the TA.
4. If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at ilgan@ohsu.edu.
5. Students having difficulties with Sakai should contact the Sakai Help Desk at sakai@ohsu.edu or at (877) 972-5249. Sakai help is available M-F from 8am to 10-pm and weekends from Noon to 5pm. Do not contact the instructor.
Class Schedule and Assignment List
(subject to change after discussion during the first course meeting)

Note: Topics will be finalized by Week 2 in order to take into consideration student’s areas of interest and expertise: See table below for potential topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Due</th>
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<tbody>
<tr>
<td><strong>Week 1</strong></td>
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<tr>
<td>March 30</td>
<td>Introduction: Statistics in Biomedical Informatics</td>
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<td>Types of Data</td>
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<td>Study Design Review, Part 1</td>
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<td><strong>Week 2</strong></td>
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<tr>
<td>April 6</td>
<td>Descriptive Statistics and Elementary Statistics</td>
<td>Journal Club 1</td>
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<td>Study Design Review, Part 2 (if necessary)</td>
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<td>*NOTE: Class will meet in CHH 3180 Room 6</td>
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<tr>
<td><strong>Week 3</strong></td>
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<td>April 13</td>
<td>Topic 1</td>
<td>Quiz 1</td>
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<td>Final project proposal</td>
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<td><strong>Week 4</strong></td>
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<tr>
<td>April 20</td>
<td>Topic 2</td>
<td>Journal Club 2</td>
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<td><strong>Week 5</strong></td>
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<tr>
<td>April 27</td>
<td>Topic 3</td>
<td>Quiz 2</td>
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<td><strong>Week 6</strong></td>
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<tr>
<td>May 4</td>
<td>Topic 4</td>
<td>Research Week Activity</td>
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<td>*NOTE: Class will meet in CHH 3180 Room 6</td>
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<tr>
<td><strong>Week 7</strong></td>
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<tr>
<td>May 11</td>
<td>Topic 5</td>
<td>Quiz 3</td>
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<td>Draft of final project</td>
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<td><strong>Week 8</strong></td>
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<tr>
<td>May 18</td>
<td>Topic 6</td>
<td>Journal Club 3</td>
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<td>May 25</td>
<td>Memorial Day</td>
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<td></td>
<td>No Class</td>
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<tr>
<td><strong>Week 9</strong></td>
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<tr>
<td>June 1</td>
<td>Topic 7</td>
<td>Quiz 4</td>
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<td>*NOTE: Class will meet in CHH 3180 Room 6</td>
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<tr>
<td><strong>Week 10</strong></td>
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<tr>
<td>June 8</td>
<td>Review and Student Presentations</td>
<td>Final project</td>
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</tbody>
</table>
Topics to be selected from the following:

- Validity and Diagnostic Statistics
- Multivariable Regression Analysis
- Survival Analysis
- Factor and Principal Component Analysis
- Simulation and Modeling
- Analysis for complex trials (e.g., cluster randomization, cross over, adaptive trials)
- Systematic Reviews/Meta-Analysis
- Data Mining/Machine Learning
- Observational Designs that attempt to simulate randomization: e.g., Propensity Scores and Instrumental Variables
- Analytic Methods for Program Evaluation
- Networks/Decision Trees
- Student Suggestions

**NOTE:** This syllabus and class schedule is subject to change by the instructors. Changes will be made with as much advance notice as possible.