

OST 531 - Biostatistics and Epidemiology FALL SEMESTER 2009

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Co-Course Coordinators	
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Additional Lecturer	
Steve Williams, MD Associate Professor, Pediatrics 547 West Fee Hall hiramcatfish@gmail.com (517) 353-3100	Paul Quinlan, DO, MS Associate Professor, Dept of Psychiatry College of Human Medicine B-117-B West Fee Hall quinlan6@msu.edu (517) 353-3070

RATIONALE

This course is designed to help you better understand the statistics and concepts that you will run into while reading the medical journals and other research material that will be so important to both your education and your practice as a physician. It is a brief course and not intended to be an in-depth study of Epidemiology, Evidence Based Medicine or Bio-Statistics. Rather, we want to give you a short explanation of some of the terms and concepts you will surely encounter in your readings and discussions. As a by-product we hope to teach skills that are important for self directed life long learning. You will also be better prepared to give your patients the high quality patient care they seek.

A waiver is offered to students who already possess the knowledge listed in the objectives of this course. This year there are additional objectives that cover Evidence-Based Medicine.

TEXTS

Strauss, Sharon	Evidence Based Medicine; How to practice and Teach EBM 3 rd ed	Churchill-Livingstone ISBN: 0443074445	Rec
Supplemental material	Angel Site		Req

ACADEMIC HONESTY

Integrity of Scholarship and Grades (All-University Policy and General Student Regulations, pp. 77. Refer also to Integrity of Scholarships and Grades, pp. 108 and 109 of Spartan Life, 2004-2007). If any instance of academic dishonesty (cheating, plagiarism, signing in for another student, or having another student sign you in, etc.) is discovered by an instructor, it is his or her responsibility to take appropriate action. Such action may include giving a failing grade to the student in the course and/or referring the student for judicial review and possible disciplinary action which may include disciplinary suspension from the College.

GOALS

After meeting the requirements of this course students will be able to:

1. Define evidence-based medicine and discuss its benefits and limitations.
2. Develop clinical questions based on patient encounters using the PICO format
3. Describe the steps involved in formal medical research and critique a study's strengths and weaknesses
4. Describe the following studies, stating their individual strengths and weaknesses.
 - a. Case report
 - b. Case series
 - c. Cross-sectional study
 - d. Case-control study
 - e. Randomized, controlled trial
 - f. Meta-analysis
 - g. Systematic Review

Describe how each study could be used to test a working hypothesis.
State the conditional prediction that would be tested by each type of study.

1. When appraising scientific studies
 - a. Explain Prevalence and Incidence
 - b. Explain Variables (confounding factors) and their influence on outcomes
 - c. Identify and explain Measures of variability and their relationship to sample size and influence on precision
 - i. Standard deviation (concept not calculation)
 - ii. Confidence Intervals
 - d. Inferential statistics
 - i. Identify and explain the Null and Working hypothesis for an article
 - ii. Identify and explain the P-value. Determine when the P-value is clinically significant
 - iii. Define error types (α and β) and their influence on the power of a study
 - e. Validity of studies
 - i. Identify and describe randomization, concealment, bias and blinding. Explain how they influence the validity of a study.
 - ii. Identify and explain intention to treat analysis and its effect on validity
 - f. Diagnostic studies
 - i. Explain the concepts of sensitivity, specificity, positive and negative predictive values
 - ii. Use the concepts of SPPIN and SNNOUT for 'ruling' in/out disease.
 - iii. Describe likelihood ratios and their use in clinical decision making.
 - iv. Explain the concepts of pretest and posttest in clinical reasoning. Convert odds to probabilities
 - g. Therapeutic studies
 - i. Understand the concepts of control and experimental event rates used in therapeutic studies
 - ii. Identify and use relative and absolute risk reduction, number needed to treat to assess the relevance of a study
 - h. Discuss applying clinical research to patient values when providing medical care.
2. Effectively search Medline to locate articles based on questions from a clinical scenario.
3. Critically appraise a therapeutic study using an appraisal worksheet.

READING ASSIGNMENTS AND LECTURES

Students are expected to attend lectures. Please visit the ANGEL home page for this course and look under "Lessons". There you will be directed to required readings and "Breeze" lectures as well as supportive information that may help you with some of the issues covered in the lectures.

An audience response system may be used in some lectures. Please bring iClickers with you to class.

iCLICKERS

iClickers will be used in this class. Please register your unit before class meets on Wednesday, October 14, 2009.

You are expected to bring your iClicker to class regularly so that you will always be prepared when you need to use your unit. Class will proceed as planned, even if you have forgotten to bring your iClicker with you.

1. The iClicker may be used to provide practice with concepts and principles, to stimulate discussion and/or to give mini-quizzes. Questions may be posed at any time during the class hour. No makeup experiences will be provided should you forget your iClicker.
2. If the iClicker is used to take attendance, you will be expected to arrive in class on time and to stay for the duration of the assigned activity.

As a matter of professionalism, please note that under no circumstances should you loan your iClicker to another student. Nor should you ever be in the possession of an iClicker other than your own. Answering questions or checking in for attendance on behalf of another student by using their iClicker is considered to be an act of dishonesty and may result in dismissal from the college.

ATTENDANCE

*The first lecture, 'Course Introduction' is **mandatory**. Recorded versions of each lecture will be provided on ANGEL for those that want to review a certain lecture.*

SMALL GROUP SESSIONS

There are two **mandatory** small group sessions for the course. Students will practice and discuss concepts learned in lecture in the session. Grading is based on attendance and participation in class discussions. **Participation is expected during the small group session, thus each student should prepare to contribute to meaningful discussion with his or her small group.** There will be group work as well amongst the students.

Small group session #1

Students will practice critically appraising and discussing journal articles. Students will explore concepts of study design and bias in research design

Small group session #2

Students will discuss concepts used in biostatistics, epidemiology and evidence based medicine. As a group, students will appraise an article and discuss clinical application.

EXAMS

Exams: There will be a multiple-choice and short answer Exam given on the last day of the course, Thursday, November 19, 2009 @ 7:00-8:50 a.m. The exam will cover all materials presented in the lectures and listed as required readings on Angel.

MISSED EXAMINATIONS

If you know that it will be impossible for you to take the exam on November 19, 2009 @ 7:00 a.m., please contact Bill Falls (falls@msu.edu) **prior** to November 19, 2009 to request permission to make other arrangements for meeting the final exam requirement. **In compliance with MSU-COM policy, the OST 531 final exam cannot be given prior to its originally scheduled time.**

GRADING SYSTEM:

In order to pass this segment of OST 531 you need to earn at least 70%. This may be done through a combination of the waiver exam or of the following potential points:

Item	Points	Total Points
2 Labs (attend/partic/assign)	10 each lab	20
Final Exam	approx. 50	approx. 50
Pub Med Search*	10	10
Total Points		80 (70% passing)

* This project will be explained by Leslie Behm during the course.

EXAM CONDUCT

All exams are "closed book". Therefore, you should not bring books, notebooks, backpacks, etc. to exam sessions. These items should be stored in your locker or at the perimeter of the exam room.

Calculators and hand-held computers are not to be used during exams in this course. As well, PDA's, cell phones and other electronic devices must be at the perimeter of the exam room, or stored elsewhere.

In deference to your peers, if you carry a cell-phone, please be sure that it is turned **off** and placed at the perimeter of the room with your personal belongings during the exam. If an emergency requires otherwise, please notify the course coordinator or course assistant coordinator in advance and follow their instructions.

Students will not be permitted to leave the exam room without permission. You will not be permitted to wear a hat during the exam. All exceptions are at the discretion of the course coordinator.

To avoid unnecessary disruption of other students during exams, you are **expected** to enter the exam room on time. Students will not be permitted to leave a written examination until 30 minutes past the scheduled starting time for the exam; after 30 minutes past the scheduled starting time for an examination, students will not be admitted to the examination room.

Individual multiple-choice exam results will be sent to you via e-mail. Paper copies of the correct responses will not be posted in the hallway bulletin board space.

Without exception, exams will be collected at the stated time of completion, so be sure that name, answer grids and/or blanks are filled **prior** to completion time. **Exams not turned in at the stated time of completion will not be scored.**

Examinations will NOT be given early, due to college and individual course policy.

Unless a typo is discovered, NO questions will be answered during the exam.

GRADING

In the event that you do not earn enough points to pass this course, a no-pass (N) grade will be assigned and you will be required to make up the points needed through appropriate academic activities.

COURSE EVALUATIONS

Evaluation of OST 531-Biostatistics & Epidemiology course and small group is **MANDATORY**. Evaluation of OST 531- Biostatistics & Epidemiology faculty is not mandatory but is requested and strongly encouraged. Appropriate decorum should be maintained and professional language used. These evaluations will be conducted on computer using a web-based system. Each student must log in, but the log-in name and evaluation input are not associated. We value your input. You can access the web-based evaluations at:

http://kobiljak.msu.edu/Evaluation/UnitI_II.html

LABORATORY ATTENDANCE

Attendance at (and full participation in) all Small Group Lab Sessions of OST 531 is **MANDATORY**. If you **MUST** miss a laboratory, please contact Dr. Falls, Associate Dean of Student Services (517) 353-8799 in advance to receive an excused absence. For each excused absence, students will be required to complete a make-up experience or assignment at the discretion of the course coordinator.

STUDENT ELIGIBILITY FOR REMEDIATION

Student's that receive an N grade are solely responsible to verify their eligibility for a remediation examination/experience with the MSU/COM Office of Student Services and must meet the following requirements:

- Be enrolled and/or reinstated in the College of Osteopathic Medicine
- Have completed and submitted, with all appropriate signatures, an Application for Remediation form to the Office of Student Services in Room C110 E. Fee Hall

Please note that the format for the remediation examination/experience may be variable depending upon individual student performance issues and is determined by the course coordinator in consultation with course faculty.

If a student passes the designated remediation opportunity, the student will receive a "P" grade for the number of credits enrolled in OST 590. If a student does not pass the remediation opportunity, the student will receive an "N" grade for the number or credits enrolled in OST 590. A student will not be eligible to participate in more than one remediation experience.

Fall Semester 2009 OST 531 Biostatistics & Epidemiology Lecture Schedule

Friday, September 25, 2009		
10:00–11:50 a.m.	Waiver Exam E105/E202	Dr. Patterson
Wednesday, October 14, 2009		
10:00–10:50 a.m.	Course Introduction *MANDATORY*	Dr. Patterson
11:00–11:50 a.m.	Hypothesis Testing	Dr. Stephenson
Friday, October 16, 2009		
9:00–9:50 a.m.	Epidemiology – Definitions	Mrs. Behm
Friday, October 23, 2009		
9:00–9:50 a.m.	Developing Clinical Questions	Dr. Patterson
10:00–10:50 a.m.	Medical Literature	Mrs. Behm
11:00–11:50 a.m.	Diagnostic Studies	Dr. Quinlan
Friday, October 30, 2009		
9:00 – 11:00 a.m.	GROUP 1 – (Dwing classrooms) <i>See Group List in Angel</i> *MANDATORY*	Faculty
11 a.m. – 1 p.m.	GROUP 2 – (Dwing classrooms) <i>See Group List in Angel</i> *MANDATORY*	Faculty
Friday, November 6, 2009		
10:00–10:50 a.m.	Therapeutic Studies	Dr. Patterson
11:00–11:50 a.m.	Prognosis and Risk Studies	Dr. Patterson
1:00–1:50 p.m.	ON-LINE SELF STUDY: Descriptive Statistics	Dr. Hagan
2:00–2:50 p.m.	ON-LINE SELF STUDY: Inferential Statistics	Dr. Hagan
Tuesday, November 10, 2009		
8:00–8:50 a.m.	Clinical Application	Dr. Williams
Friday, November 13, 2009		
10:00 a.m. – noon	GROUP 2 – (Dwing classrooms) <i>See Group List in Angel</i> *MANDATORY*	Faculty
noon – 2 p.m.	GROUP 1 – (Dwing classrooms) <i>See Group List in Angel</i> *MANDATORY*	Faculty
Tuesday, November 17, 2009		
8:00–8:50 a.m.	Review of Course Material	Dr. Patterson
Thursday, November 19, 2009		
7:00–8:50 a.m.	FINAL EXAM - Conrad	Dr. Patterson
DUE – 9:00 a.m.	PUB MED SEARCH DUE by end of exam	Mrs. Behm