

OST 598 – Evidence Based Medicine

Summer Semester 1 - 2022

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Notice to Students: Although course syllabi at MSUCOM have a consistent format, important details differ by course. For this reason, you must read the syllabus thoroughly at the onset of each course to know what the course will provide and what is expected of you.

Section 1 – Course Information

Course Description

Evidence-based Health Sciences is a 1-credit hour course.

Evidence-based Medicine is the practice of medicine and patient care that is based on the best available research evidence to guide clinical decisions and is applicable to the individual patient. It integrates best current available research evidence, clinical experience and individual patient values and expectations.

The Evidence-based Health Sciences is an introductory course to the practice of Evidence-based Medicine that is structured on the principles of Epidemiology, Biostatistics, Research Methods, Preventive Medicine and Public Health. The course will impart the basics of Epidemiology, Biostatistics, Research Methods, Preventive Medicine and Public Health in relation to Evidence-based Medicine and clinical decision making. The principles and methods taught in the course will continued to be reinforced longitudinally during the courses downstream in the medical curriculum.

Course Goals

Upon completion of this course, students will be able:

1. To demonstrate an understanding of the following basics of Biostatistics: types and presentation of data, measures of association (relative risk, odds ratio), hypothesis testing (p-values and confidence intervals), correlation, regression, association and causation, statistical tests (t-test, Analysis of Variance, Chi-squared test)
2. To demonstrate an understanding of the following basics of Epidemiology: frequency of disease (incidence, prevalence, case-fatality rate, mortality), epidemic, prevention (primary, secondary and tertiary prevention), diagnostic and screening tests (sensitivity, specificity, predictive values, likelihood ratios), difference between random error and systematic error, bias and confounding.
3. To demonstrate an understanding of the following basics of Observational studies: ecological study, cross-sectional study, cohort study, case-control study, nested case-control study, measures of association (incidence rate, relative risk/risk ratio, odds ratio, prevalence ratio)
4. To demonstrate an understanding of the following basics of Randomized clinical trials (RCT): sample size, power and types of error, generalizability (external validity) and internal validity, Phase I-IV drug testing trails (FDA), types of RCTs, Factorial experiments, Parallel groups design, cluster randomized trials, hypothesis type RCT (superiority/non-inferiority/equivalence), intention-to-treat analysis, per-protocol analysis.
5. To demonstrate an understanding of the basics of Evidence-Based Medicine (EBM): Developing a clinical question: PICO framework and clinical vignettes, practice of EBM, searching and acquiring best current evidence, pre-appraised evidence, evidence-based healthcare (EBHC) pyramid, critical appraisal of evidence: validity; magnitude of results (absolute risk reduction, relative risk reduction, absolute risk increase, number needed to treat, number needed to harm); precision of results (confidence intervals); class of recommendations and level of evidence to clinical strategies, interventions, treatments, or diagnostic testing in patient care; applicability and feasibility of results to our patient.

6. To demonstrate an understanding of the basics of public health: definition of public health, relationship between clinical care and public health, contribution of the social determinants of health in the promotion of health, role of public health in relation to contemporary healthcare challenges.
7. To demonstrate critical appraisal of a randomized controlled trial
8. To demonstrate an understanding of systematic review and meta-analysis (Forest plot, Funnel plot, risk of bias chart, Cates plot, heterogeneity)

Measurable Course Objectives

The American Osteopathic Association has identified osteopathic core competencies (OCC) essential for practice as a future osteopathic physician. These are embedded throughout programmatic objectives and curriculum. The curricular structure also encourages proficiency in the Core Entrustable Professional Activities (EPAs) for Entering Residency as defined by the Association of American Medical Colleges to help build toward that future phase of the journey toward medical practice. By the end of this specific course, learners should be able to achieve the following objectives within each competency domain indicated:

Practice-Based Learning and Improvement

1. Articulate and apply fundamental epidemiologic concepts, including population science, frequency of disease, prevention, diagnostic and screening tests, difference between random error and systematic error, bias and confounding. Including concepts such as: data types and presentation, hypothesis testing, statistical testing, frequency of disease, prevention, diagnostic and screening tests, public health and prevention, risk of bias, etc. (*Epidemiology/Biostatistics*)
2. Determine the clinical significance of research evidence and statistical inferences. This may incorporate concepts such as: PICO frame and clinical vignettes, systematic review, meta-analysis, etc. Demonstrate adequate understanding of public health and its relationship with clinical care as well as the role public health plays in relation to healthcare challenges. (*Clinical Significance*)
3. Use clinical decision-making tools and procedures to retrieve and interpret evidence to advance patient care. This may incorporate concepts such as: developing a clinical question, the PICO framework, searching and acquiring the best current evidence, etc. (*Clinical Decision-Making - EPA 7*)
4. Apply evidence-based osteopathic medicine principles and practice, incorporating evidence into learning. This may incorporate concepts such as: critical appraisal of evidence, evidence-based health care (EBHC), magnitude of results, precision of results, developing a clinical question, practice of EBM, searching and acquiring best current evidence, pre-appraised evidence, critical appraisal of evidence: validity; applicability and feasibility of results to our patient, etc. (*EBM Principles/Practice*)

Scientific Method & Professionalism

5. Demonstrate knowledge of, and ability to apply, methods by which research is conducted, evaluated, explained to patients/subjects of a clinical study, and applied to patient care. This may incorporate concepts such as: sample size, power, error, validity, study design (ecological

vs. cross-sectional vs. cohort vs. case-control vs. nested case-control), measures of association, etc. (*Research Methods*)

6. Demonstrate knowledge of, and ability to apply, basic scientific and ethical principles of clinical and translational research. This may incorporate concepts such as: Phase I-IV drug testing rails (FDA), types of RCTs, Factorial experiments, Parallel groups design, intention-to-treat or per-protocol analysis, etc. (*Ethical Research, Clinical/Translational Research*)

Professional Development and Reflection Skills

Additionally, the American Osteopathic Association indicates several other competencies on which professional development and reflection across time will foster effective medical practice. These include the ability to work collaboratively as part of an interprofessional team; the maintenance of an inquisitive and scientific approach to learning and medical practice; and the adoption of self-direction in lifelong learning and clinical decision-making. This course will contribute to the development of these longitudinal competencies or skills as indicated:

Self-Directed and Lifelong Learning

Self-directed learning is a 4-step process that occurs within an encapsulated timeframe. The goal of self-directed learning is to help foster self-direction in your lifelong learning and clinical decision-making. This course includes the steps of self-directed learning as follows:

1. **Self-Assessment of Learning Needs** – OST 598 will assist you in assessing your learning needs through the formulation of related clinical questions, using the PICO framework that is common to evidence-based medical practice.
2. **Identification, Analysis, & Synthesis of Information** – OST 598 will encourage you to engage in rigorous independent research to address your clinical questions, leveraging both background and foreground knowledge sources.
3. **Appraisal of Information Source Credibility** – OST 598 will help you appraise the credibility of information sources, evaluating them from both scientific and clinical perspectives with use of the PICO framework.
4. **Feedback on Information-Seeking Skills** – Finally, OST 598 will support you in practice-based learning and improvement, by pushing you to reflect on your knowledge gaps and information seeking skills, soliciting and incorporating related feedback.

Course Coordinator

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Course Faculty

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Curriculum Assistants

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MUC	Rosemary Shubeck	shubeckr@msu.edu	586-263-6746

Lines of Communication

- For administrative aspects of the Course: contact the course coordinator.
- For content questions relating to a specific lecture or topic: contact the faculty presenter for that specific portion of the course or your SE MI on-site instructor.
- For absences/missed exams (see excused absence information below)
- Please set your notifications in D2L to immediate to receive posted News announcements. You may choose to receive notifications by email or SMS.

Office Hours

Questions concerning may be discussed individually by making an appointment with the Course Coordinator, *Furqan B. Irfan*, West Fee Hall, Room 325A, by e-mail: irfanfur@msu.edu.

Course Web Site

The URL for the Course website is: <https://d2l.msu.edu>

Textbooks and Reference Materials

Required

- Users' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice, 3rd ed. Gordon Guyatt, Drummond Rennie, Maureen O. Meade, Deborah J. Cook. [Online copy of User's Guides to the Medical Literature](#)
- Clinical Epidemiology: The Essentials, 5th edition Robert H. Fletcher, MD; Suzanne W. Fletcher, MD; Grant S. Fletcher, MD. [Online copy of Clinical Epidemiology](#)

- Medical Statistics from Scratch: An Introduction for Health Professionals, 4th edition David Bowers. [Online copy of Medical Statistics from Scratch](#)

Optional

- Principles of Epidemiology in Public Health Practice, Third Edition. An Introduction to Applied Epidemiology and Biostatistics. (CDC). Lesson 3: Measures of Risk
<https://www.cdc.gov/csels/dsepd/ss1978/lesson3/index.html>

Course-based Academic Support

The course faculty are here to facilitate your learning. Please feel free to contact the Course Coordinator with any personal issues you may have involving this course. Additional academic support resources can be accessed through MSUCOM Academic and Career Guidance and MSUCOM Personal Counseling.

Course Begin and End Dates

OST 598 begins on 6/20/22 and ends on 8/15/22. See addendum for detailed daily course schedule.

Exams/Assessments

The successful achievement of learning objectives will require knowledge and skills acquired in other portions of the overall MSUCOM educational program. Students will be expected to apply concepts and vocabulary learned in other courses to problem-solving for exams/assessments in this course.

To maintain security of assessments, you may NOT post questions on the discussion board regarding exam questions or quiz questions. Kindly email your questions to the course coordinator.

Assessments	Projected Points	Material to be Covered
D2L Quiz 1	10	Epidemiology 1, 2, 3
Exam 1 (S1 UE2)	35	Biostatistics 1 & 2 Epidemiology 1, 2, 3 & 4
D2L Quiz 2	10	Epidemiology 5 and 6 EBM 1
D2L Quiz 3	10	EBM 2 and 3 Biostatistics 3
Exam 2 (S1 UE5)	35	Biostatistics 3 Epidemiology 5 & 6 Evidence based-Medicine 1, 2 & 3

D2L Quiz 1, 2 and 3 will consist of 10 MCQs each, worth 1 point each (10 points total) and will have a 15 minute time limit, to be taken within a 60 minute window on D2L individually.

Workshop 1 (EBM 4: Critical appraisal of randomized controlled trial) and Workshop 2 (EBM 5: PICO) are mandatory attendance. Please report to your site location at either EL, MUC or DMC (attendance will be taken).

Course Grades

The course faculty determine the threshold for satisfactory performance in each preclerkship course. Your course grade will be determined by the following formula:

$$\frac{(\text{Points acquired in all exams and assessments})}{(\text{total points possible})} \times 100\% \\ = \text{Final Percent Score}$$

- **P-Pass**—means that you have achieved a satisfactory level of performance and will receive credit for this course. To obtain a “P” grade for this course, you must earn a final percent scores of 70%.
- **N-No Grade**—means that you have not achieved a satisfactory level of performance and no credit will be granted for this course. If you earn a final percent score below 70%, you will receive an “N” grade.
- **Remediation** – If you receive an “N” grade and meet the criteria below, you will be eligible to attempt remediation:
 - Earn a final percent score in the course of 50% or greater, and
 - Must have sat for all exams, quizzes and workshops

The remediation opportunity for this course will be by examination. Passing is 70%.

All remediation exams for semester 1 are scheduled for August 22, 2022. Refer to the remediation policy information provided in Section 2 of this syllabus for more information.

Student Evaluation of the Course

We want your feedback on how to improve this course.

- **Informal Feedback:** Feel free to approach the Course Coordinator, Dr. Furqan Irfan, or any of the other course faculty with your reactions and suggestions.
- **Formal Evaluation:** In addition to the above, we ask every student in the class to complete formal on-line course evaluation upon conclusion of the course. Student feedback provides Course Coordinators with valuable information regarding their performance, the performance of their colleagues, and the quality of the course. The information gained from these evaluations is used to continuously improve future offerings of this course. Students can access the evaluation system at: [MSUCOM Pre-clerkship Evaluation System](#).

Section 2 – Policies

Please refer to the Student Handbook at <https://com.msu.edu/current-students/student-handbook-course-catalog> for these and other policies.

Academic Honesty and Professionalism

Every student is responsible for their behavior and is expected to adhere to all MSU and MSUCOM policies of academic honesty and professionalism, as outlined in the MSUCOM Student Handbook and the MSU Medical Student Rights and Responsibilities. These documents may be found on the MSUCOM website. Additional guidance on academic integrity may be found on the MSU Ombudsperson's website at <https://ombud.msu.edu/sites/default/files/content/Academic-Integrity-at-MSU-updated-August-2017.pdf>

Incidents of academic dishonesty or professional misconduct will be addressed by the faculty, administration, or staff; such action may include, but is not limited to: giving a failing grade, referring a student for judicial review, directing the student to the Associate Dean of Medical Education, evaluation by the Committee on Student Evaluation, and other actions outlined in the Medical Student Rights and Responsibilities document.

Types of Class Sessions

MSUCOM designates lectures and other class sessions by their delivery method. While additional terms may be used in a specific course, the following will provide general guidance to the type of session:

- Live or livestream lecture: broadcast at a designated time; intended to be viewed synchronously
- Online Lecture: recorded content, may be viewed asynchronously
- Webinar: more interactive session where student participation is expected
- Lab: may refer to on-site clinical skills training or online lab session; see details

Changes to Course Schedule or Requirements

Due to external circumstances, the course requirements published in the course syllabus and/or course schedule may be subject to change. Timely notification Communication regarding changes will be provided to enrolled students via the course D2L site and/or email. Any changes made will consider the MSU Code of Teaching Responsibility and the MSU Medical Students Rights and Responsibilities.

Mandatory and Optional Class Sessions

All lectures and other class sessions are considered to be integral to the course, and students are expected to attend, view, or participate in each session. Some sessions are designated as “mandatory” in that attendance at the session on the scheduled date and time is required. Depending on the course, a student may earn points for attending or participating in a mandatory session or may lose points for failing to attend or participate. Availability of make-up points for missed sessions is at the discretion of the course coordinator. Optional class sessions are offered by faculty to assist students in learning or reviewing course content.

Absences from Mandatory and Examinations/Assessments

It is the responsibility of the student to know which class sessions are deemed as mandatory and comply with the MSUCOM policy regarding absences from mandatory sessions and examinations. This policy

may be found in the MSUCOM Student Handbook on the MSUCOM website. Requests for an excused absence must be submitted via the [student portal](#).

Computer-Based Testing

It is the responsibility of each student to know and comply with the MSUCOM policy on computer-based testing. This policy may be found in the MSUCOM Student Handbook on the MSUCOM website.

Administration of quizzes, examinations, and other assessments may be self-proctored, virtual proctored, or classroom proctored. Regardless of the proctoring method, you are expected to take the exam in a quiet, private setting. Just like in a proctored exam, you are not to access notes, textbooks, references, your phone, or other materials, and you are not to interact with fellow students or others. Remember that integrity is defined as what you do when no one is looking.

You are also expected to not record, photograph, take screen shots, make notes of, or otherwise attempt to make a copy of any exam item for any purpose, including your personal use. A student who is discovered to have cheated or breached exam security will be subject to formal disciplinary action, up to and including dismissal from MSUCOM.

If you have concerns or evidence of an exam security breach on this or any exam, you may report that to an MSUCOM administrator or through the online concern form.

Medical Student Rights and Responsibilities

If problems arise between instructor and student, both should attempt to resolve them by informal, direct discussions. If the problems remain unsolved, the Associate Dean for Medical Education and/or the MSU Ombudsperson may be consulted. The MSU Medical Student Rights and Responsibilities (MSRR) document defines processes for additional steps, including submission of a formal grievance. The MSSR may be found in the MSUCOM Student Handbook and online at splife.studentlife.msu.edu.

iClicker Student Policy

It is your responsibility to know and comply with the iClicker Student Policy. This policy may be found in the MSUCOM Student Handbook. If you forget your device or if it does not work, for whatever reason, no make-up experiences will be provided, and no points will be given.

If iClicker Student is used to take attendance for an on-campus event, you will be expected to arrive to the physical location on time and to stay for the duration of the assigned activity. If iClicker Student is used to take attendance for an online event, you will be expected to start the session at the scheduled time and participate for the duration of the assigned activity.

As a matter of professionalism, please note that under no circumstances should you provide access to your iClicker Student account to another student by sharing your device and/or account login, nor should you accept another student's device or login credentials to access iClicker Student on their behalf. Answering questions or checking in for attendance on behalf of another student by using their device or account is considered to be academic dishonesty and may result in disciplinary action up to and including dismissal from the college.

Remediation

The MSUCOM Policy for Retention, Promotion and Graduation requires successful completion of each required course to progress in the curriculum. If you receive an “N” grade in a course, that grade will be recorded on your official transcript; you must meet the course requirement by successfully remediating or repeating the course.

Eligibility to attempt remediation of the course is determined by criteria described in the “Course Grades” section of the syllabus. If you are not eligible to attempt remediation, or if you fail the remediation, you must retake the course, provided you are eligible to continue in the program as determined by the Committee on Student Evaluation.

Student Safety and Well-being

The MSUCOM website and Student Handbook provide information on student safety, campus security, access to medical care and counseling services, and to policies on injuries and exposures. If you have an injury or acute illness on campus, an incident report should be completed. The form is available on the MSUCOM intranet or from Academic Programs.

Academic Support Resources at MSUCOM

As a way to acclimate you to the curriculum at MSUCOM, we have created a program called On Target: <https://michiganstate.sharepoint.com/sites/OnTargetforAcademicSuccess>

On this site you will find semester roadmaps which gives a general overview of each semester, tools needed to be successful in the curriculum and targeted resources for your unique learning situation. In each semester’s road map, you will also find course expectations, tips for success, potential trouble spots, longitudinal course integration, and specific course study guides.

Requests for Accommodations

Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities (RCPD) at 517-884-7273 or online at rcpd.msu.edu. Once eligibility for an accommodation has been determined, you may be issued a Verified Individualized Services and Accommodation (VISA) form. Each VISA includes an expiration date; to request an accommodation, you must have an active VISA. You may work with RCPD to renew a VISA.

During the preclerkship curriculum, the college will help to coordinate accommodations for additional testing time. Provide your VISA to Nancy Thoma, thoman@msu.edu, A333 East Fee Hall at the start of the term and/or at least two weeks prior to the assessment event (test, project, labs, etc.). Requests for accommodations received with less notice will be honored whenever possible. You may choose whether or not you wish to use accommodations for a particular event. For other accommodations, you may also review your VISA with the course coordinator and curriculum assistant assigned to that course.

Title IX Notifications

Michigan State University is committed to fostering a culture of caring and respect that is free of relationship violence and sexual misconduct, and to ensuring that all affected individuals have access to services. For information on reporting options, confidential advocacy and support resources, university policies and procedures, or how to make a difference on campus, visit the Title IX website at titleix.msu.edu.

Limits to confidentiality. Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, you should be aware that University employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues to protect the health and safety of MSU community members and others. Instructors must report the following information to other University offices (including the Department of Police and Public Safety):

- Suspected child abuse/neglect, even if this maltreatment happened when you were a child;
- Allegations of sexual assault, relationship violence, stalking, or sexual harassment; and
- Credible threats of harm to oneself or to others.

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with the MSU Counseling and Psychiatric Services.

Addendum: Course Schedule

Course schedule for the current semester will be posted to D2L. Changes to the course schedule will be noted on the class academic calendar ("Google calendar") and communicated to students via D2L and/or email. The schedule for the most recent offering of this course will be posted on the MSUCOM website under Current Students/Preclerkship Curriculum.