Department of Epidemiology and Biostatistics

Epidemiology 3330G
Systematic Reviews and Meta-Analysis
Winter 2021

1. Technical Requirements:

- Stable internet connection
- Laptop or computer
- Working microphone
- Working webcam (suggested)

2. Course Overview and Important Dates:

<table>
<thead>
<tr>
<th>Delivery Mode</th>
<th>Dates</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>Tuesdays</td>
<td>1:30 to 3:30 pm (EST)</td>
</tr>
</tbody>
</table>

*Details about design and delivery of the course are listed below in Section 4

<table>
<thead>
<tr>
<th>Classes Start</th>
<th>Reading Week</th>
<th>Classes End</th>
<th>Study Day(s)</th>
<th>Exam Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 11</td>
<td>February 15 to 19</td>
<td>April 9</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* The last day to drop Term 2 courses without penalty is March 14, 2021

3. Contact Information

<table>
<thead>
<tr>
<th>Course Instructor</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Kelly Anderson (Systematic Reviews)</td>
<td><a href="mailto:kelly.anderson@schulich.uwo.ca">kelly.anderson@schulich.uwo.ca</a></td>
</tr>
<tr>
<td>Dr. Monali Malvankar (Meta-Analysis)</td>
<td><a href="mailto:monali.malvankar@schulich.uwo.ca">monali.malvankar@schulich.uwo.ca</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaching Assistant</th>
<th>Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Joo-Hyun Jeong (Systematic Reviews)</td>
<td><a href="mailto:jjeong46@uwo.ca">jjeong46@uwo.ca</a></td>
</tr>
<tr>
<td>Andrea Mataruga (Meta-Analysis)</td>
<td><a href="mailto:amatarug@uwo.ca">amatarug@uwo.ca</a></td>
</tr>
</tbody>
</table>
4. Course Description and Design

Systematic reviews form the core of evidence-based decision-making in health care and are based on reliable syntheses of research and information. This course will cover the theory and rationale behind systematic reviews, discuss the strengths and limitations of the method, and provide step-by-step guidance on how to actually perform a systematic review. This course will also cover the details of the process of conducting a meta-analysis. Because this course aims to teach a skill, a large portion of the coursework involves “learning by doing”.

The first half of the course will focus on systematic reviews. Students will be divided into review teams, and each team will work through the steps of a systematic review project. The weekly asynchronous lectures will cover key information on how to conduct a systematic review. Each review team will meet with the course instructor during the weekly synchronous session (Tuesdays) for consultation on their project and to address any questions or issues that arise throughout the process. This will allow students to develop these systematic review skills in a supported environment.

The second half of the course will focus on meta-analysis. The weekly asynchronous lectures will cover the details of the process of conducting a meta-analysis, discuss strengths and limitations of the methods, and give step-by-step guidance on how to perform a meta-analysis, sub-group analysis, cumulative meta-analysis, meta-regression, publication bias, and reporting results of meta-analysis. During the weekly synchronous session (Tuesdays), the course instructor will solve meta-analysis examples for various data types using Microsoft excel as well as STATA 16.0 software and address any questions or issues that arise throughout the process. This will allow students to develop these meta-analysis skills in a secured and supported environment.

Prerequisites: Biology 2244A/B or Statistical Sciences 2244A/B, and Epidemiology 2200A/B, with a minimum mark of 75% in each.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Dates</th>
<th>Time</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual asynchronous lectures</td>
<td>N/A</td>
<td>1 hour</td>
<td>Weekly</td>
</tr>
<tr>
<td>Virtual synchronous class session</td>
<td>Tuesdays</td>
<td>1:30 to 3:30 pm (EST)</td>
<td>Weekly</td>
</tr>
</tbody>
</table>

- Asynchronous pre-work must be completed prior to the synchronous sessions.
- For the first half of the course focused on systematic reviews, the synchronous sessions will consist of group meetings with the instructor regarding course projects. Each group will be assigned a time within the weekly synchronous time slot.
- For the second half of the course focused on meta-analysis, the synchronous sessions will consist of solving meta-analysis examples for various data types and using STATA 16.0 to develop forest plots and funnel plots, conduct sub-group analysis, cumulative meta-analysis, and meta-regression.
- Missed work from the synchronous session should be completed within 48 hours.

All course material will be available through OWL: http://owl.uwo.ca. Any changes will be indicated on the OWL site and discussed with the class.
If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).
5. Learning Outcomes

Upon successful completion of this course, students will be able to:

- Recognize different types of literature reviews and understand how they are used in health care decision making
- Develop a systematic review protocol that clearly defines the study objectives and outlines the search strategy
- Conduct the literature search, study screening, data extraction, and risk of bias assessment
- Apply techniques for conducting meta-analyses, including fixed- and random-effect models.
- Recognize different types of heterogeneity and design forest, and funnel plots.
- Identify when and how to perform a sub-group analysis and recognize various statistical issues related to sub-group analysis.
- Apply techniques for conducting cumulative meta-analysis and meta-regression.
- Write-up a systematic review and meta-analysis manuscript.

6. Course Content and Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 11 – 15</td>
<td>Introduction to Systematic Reviews</td>
</tr>
<tr>
<td>2</td>
<td>January 18 – 22</td>
<td>Developing a Search Strategy</td>
</tr>
<tr>
<td>3</td>
<td>January 25 – 29</td>
<td>Study Screening</td>
</tr>
<tr>
<td>4</td>
<td>February 1 – 5</td>
<td>Data Extraction</td>
</tr>
<tr>
<td>5</td>
<td>February 8 – 12</td>
<td>Risk of Bias Assessment</td>
</tr>
<tr>
<td>–</td>
<td>February 15 – 19</td>
<td>Reading Week</td>
</tr>
<tr>
<td>6</td>
<td>February 22 – 26</td>
<td>Reporting Systematic Reviews</td>
</tr>
<tr>
<td>7</td>
<td>March 1 – 5</td>
<td>Introduction to Meta-Analysis</td>
</tr>
<tr>
<td>8</td>
<td>March 8 – 12</td>
<td>Fixed-Effects and Random-Effects Models</td>
</tr>
<tr>
<td>9</td>
<td>March 15 – 19</td>
<td>Presentation of Group Projects</td>
</tr>
<tr>
<td>10</td>
<td>March 22 – 26</td>
<td>Sub- Group Analyses</td>
</tr>
<tr>
<td>11</td>
<td>March 29 – April 2</td>
<td>Cumulative Meta-analysis and Meta-Regression</td>
</tr>
<tr>
<td>12</td>
<td>April 5 – 9</td>
<td>Publication Bias and Reporting Meta-Analysis</td>
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Results
7. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Format</th>
<th>Weighting</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Practice Problems</td>
<td>Online via OWL</td>
<td>5%</td>
<td>N/A</td>
</tr>
<tr>
<td>Peer Evaluation</td>
<td>Online via OWL</td>
<td>5%</td>
<td>February 26</td>
</tr>
<tr>
<td>Weekly Journal Entries (5)</td>
<td>Online via OWL</td>
<td>10%</td>
<td>Every Sunday</td>
</tr>
<tr>
<td>Group Project Presentation</td>
<td>Online via Zoom</td>
<td>10%</td>
<td>February 23</td>
</tr>
<tr>
<td>Group Review Report</td>
<td>Upload to OWL</td>
<td>20%</td>
<td>February 26</td>
</tr>
<tr>
<td>Weekly Meta-analysis Example</td>
<td>Upload to OWL</td>
<td>5%</td>
<td>N/A</td>
</tr>
<tr>
<td>Meta-Analysis Assignment #1</td>
<td>Upload to OWL</td>
<td>10%</td>
<td>March 12</td>
</tr>
<tr>
<td>Group Project Presentation</td>
<td>Online via Zoom</td>
<td>5%</td>
<td>March 16</td>
</tr>
<tr>
<td>Meta-Analysis Assignment #2</td>
<td>Upload to OWL</td>
<td>10%</td>
<td>March 26</td>
</tr>
<tr>
<td>Final Assignment</td>
<td>Upload to OWL</td>
<td>20%</td>
<td>April 23</td>
</tr>
</tbody>
</table>

- All assignments are due at 5:00 pm EST unless otherwise specified
- Any requests for marking reassessment should be submitted in writing to the course instructor
- After an assessment is returned, students should wait 24 hours to digest feedback before requesting reassessment; to ensure a timely response, please reach out within 7 days

Information about late or missed evaluations:
- Please discuss an alternative deadline with the instructor in advance if you foresee difficulties meeting the assigned due dates
- Late assessments without prior approval or illness self-reports will be subject to a late penalty (5% per day)
- Late assessments with illness self-reports should be submitted within 48 hours of submission of the last illness self-report

8. Communication:

- Students should check the OWL site every 24 to 48 hours
- Discussion forums will be monitored daily, and students will receive a response in 24 to 48 hours
- This course will use the OWL forum for discussions
- Students should post all course-related content on the discussion forum so that everyone can access answers to questions
- The discussion forums will be monitored by the instructor and teaching assistant

9. Weekly Group Meetings for Systematic Review part:
The weekly synchronous sessions will involve group meetings with the course instructor for project consultation. Each group will be assigned a time during the timetabled hours (Tuesdays from 1:30 to 3:30 pm EST)

If needed, meetings can be scheduled with the course instructor by appointment (email)

10. Resources

- Stata/IC Statistical Software
- Any additional readings and other course materials will be posted to the weekly lesson folder on OWL

11. Professionalism & Privacy:

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- Students are expected to follow online etiquette expectations provided on OWL
- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed in any format
- Students will be expected to take an academic integrity pledge before some assessments
- All recorded sessions will remain within the course site or unlisted if streamed

12. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted
to help you succeed.

3. Take notes as you go through the lesson material. Treat this course as you would a face-to-face course. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.

4. Connect with others. Try forming an online study group and meeting on a weekly basis for study and peer support.

5. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor or teaching assistant.

6. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

13. Important Policy Information

Statement on Copyright and Audio/Video Recording

All of the remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor. You must always ask permission to record another individual and you should never share or distribute recordings.

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws.

1. Western Academic Policies and Statements

Absence from Course Commitments

Policy on Academic Consideration for Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reported absence or via the Academic Counselling unit. Students have two self-reports to use throughout the academic year; absence from course commitments including tests, quizzes, presentations, labs, and assignments that are worth 30% or less can be self-reported. Self-reported absences cover a student for 48 hours (yesterday + today or today + tomorrow). Your instructor will receive notification of your consideration; however, you should contact your instructor immediately regarding your absence. Students are expected to submit missed work within 24 hours of the end of the 48-hour period. Please review details of the university’s policy on academic consideration for student absences.

If you have used both their self-reported absences or will miss more than 48 hours of course requirements, a Student Medical Certificate (SMC) should be signed by a licensed medical or mental health practitioner and you should contact academic counselling. Academic Counselling will be operating virtually this year and can be contacted at scibmsac@uwo.ca.

Accommodation for Religious Holidays
The policy on Accommodation for Religious Holidays can be viewed here.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found here.

Academic Offenses

“Scholastic offences are taken seriously, and students are directed here to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities.

Correspondence Statement

The centrally administered e-mail account provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts here.

Turnitin and other similarity review software

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com.

2. BMSUE Academic Policies and Statements

Cell Phone and Electronic Device Policy (for in-person tests and exams)

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices MUST be left either at home or with the student’s bag/jacket at the front of the room and MUST NOT be at the test/exam desk or in the individual’s pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final
grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

3. Support Services

As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page http://www.music.uwo.ca/, and our own McIntosh Gallery http://www.mcintoshgallery.ca/. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/

Registrarial Services: http://www.registrar.uwo.ca
USC Student Support Services: http://westernusc.ca/services/
Student Development Centre: http://www.sdc.uwo.ca/
SGPS Life & Community web page: https://grad.uwo.ca/life_community/self/index.html

The following links provide information about support services at Western University.

- Academic Counselling (Science and Basic Medical Sciences)
- Appeal Procedures
- Registrarial Services
- Student Development Services
- Student Health Services

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate or undergraduate chair), or other relevant administrators in their unit.

Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.