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>March 1</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. Monali Malvankar</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>
</tr>
</thead>
<tbody>
<tr>
<td>Andrea Mataruga</td>
<td><a href="mailto:amatarug@uwo.ca">amatarug@uwo.ca</a></td>
</tr>
</tbody>
</table>
4. Course Description and Design

Meta-analysis is used in every field including education, psychology, criminology, business, and ecology. Pharmaceutical companies use meta-analysis to synthesize evidence from a series of studies to assess the efficacy of a drug. This course 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. Further, 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 weekly asynchronous lectures will cover the theoretical aspects of why, how, and when to conduct a meta-analysis, will cover various elements of meta-analysis, effect size, fixed-effect model, random-effects model, heterogeneity, 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. 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, Epidemiology 2200A/B, and Epidemiology 9582S 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.
☑️ 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](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](http://owl.uwo.ca).
5. **Learning Outcomes**

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

- 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 (optional).

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>March 1 – 5</td>
<td>Introduction to Meta-Analysis</td>
</tr>
<tr>
<td>2</td>
<td>March 8 – 12</td>
<td>Fixed-Effects and Random-Effects Models</td>
</tr>
<tr>
<td>3</td>
<td>March 15 – 19</td>
<td>Presentation of Group Projects</td>
</tr>
<tr>
<td>4</td>
<td>March 22 – 26</td>
<td>Sub- Group Analyses</td>
</tr>
<tr>
<td>5</td>
<td>March 29 – April 2</td>
<td>Cumulative Meta-analysis and Meta-Regression</td>
</tr>
<tr>
<td>6</td>
<td>April 5 – 9</td>
<td>Publication Bias and Reporting Meta-Analysis Results</td>
</tr>
</tbody>
</table>
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 Meta-analysis Example</td>
<td>Upload to OWL</td>
<td>10%</td>
<td>N/A</td>
</tr>
<tr>
<td>Meta-Analysis Assignment #1</td>
<td>Upload to OWL</td>
<td>20%</td>
<td>March 12</td>
</tr>
<tr>
<td>Group Project Presentation</td>
<td>Online via Zoom</td>
<td>10%</td>
<td>March 16</td>
</tr>
<tr>
<td>Meta-Analysis Assignment #2</td>
<td>Upload to OWL</td>
<td>20%</td>
<td>March 26</td>
</tr>
<tr>
<td>Final Assignment</td>
<td>Upload to OWL</td>
<td>40%</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
- Question and Answer forum will be monitored daily, and students will receive a response in 24 to 48 hours
- This course will use the OWL forum for Questions
- The Question and Answer forum will be monitored by the instructor and teaching assistant

9. Resources
10. 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

11. 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.

12. Western Academic Policies and Statements

Policy on Accommodation for Medical and Non-Medical Absences
All non-medical absences must be approved in advance. In the case of an unexpected absence on compassionate grounds, documentation may be requested. If documentation is required for either
medical or non-medical academic accommodation, then such documentation must be submitted by the student to the instructor.

**Statement on Academic Offences**
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. 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 The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

**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.

**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/

Registriaral 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

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.
Student Accessibility Services
Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both SAS and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

Department & Faculty Offices
The Epidemiology & Biostatistics main office is located in K201 in the Kresge Building on Main campus.