

**Department of Epidemiology and Biostatistics****Epidemiology 9590T (Second Quarter, Winter Term, 2022)**

## Measurement in Epidemiology

**Class Meeting Time:** Fridays from 11:00 A.M. to 1:00 P.M. (March 4 through April 8)

**Location:** To be announced

**Instructor:** Marnin J. Heisel, Ph.D., C.Psych.  
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**Office:** Parkwood Institute Mental Health Building (550 Wellington Road), #F4-365

**Office Hours:** Dr. Heisel will be available to meet virtually (whether by e-mail, phone, or Zoom meeting) at your convenience. Please feel free to e-mail him to request a meeting and you will typically hear back within 24 hours.

**Course Information**

**Co-requisites:** Epidemiology 9551A & one of Biostatistics 9509A or Biostatistics 9510A

**Course Weight:** 0.25 Credits

Please ensure that you have the necessary course pre-requisites before signing-up to take this course.

**Course Overview**

This course focuses on issues relevant to testing and measurement, and specifically regarding the development, administration, scoring, and interpretation of standardized measures used in health research.

Topics to be covered will include: the modern history of testing and measurement; ethical issues regarding administering, scoring, and interpreting clinical or diagnostic measures; pragmatic considerations-such as how to select a scale for use in research and evaluation, when to adopt or modify an existing scale, and when (and how) to develop a new one; standard psychometric considerations regarding assessing a scale's reliability, validity, and factor structure.

## Course Overview (cont.)

Whereas the statistical underpinnings of approaches to testing and measurement will be reviewed more fully in weekly readings, the weekly lectures will focus largely on the pragmatic use of statistics when selecting, evaluating, and interpreting the findings of ratings scales in research and evaluation.

Classes will follow an interactive seminar/discussion format, and may include presentations, guest lectures, group discussions, class assignments, and in-class work. Frequent attendance of lectures is crucial to gaining an understanding and appreciation of the course material. You are encouraged to participate actively in class discussions, to review class materials to be prepared to contribute to weekly discussions, and to ask questions regarding areas of interest, difficulty, or concern.

### **Course Learning Outcomes:**

By the end of this course, students will be able to:

- Demonstrate an introductory-level understanding of issues relevant to testing and measurement;
- Identify considerations and procedures inherent in selecting a test or rating scale;
- Discuss challenges and processes involved in constructing a new test or rating scale;
- Describe the concept and impact of error in testing and measurement;
- Demonstrate a working knowledge of the concepts of reliability, validity, and standardization.

A key goal of this course is for students to develop a greater comfort and familiarity with issues relevant to testing and measurement in research and a greater sensitivity to the appropriate and ethical usage of testing measures and communication of their results.

### **Lecture Dates and Topics**

Week	Dates	Topic	Presenter
1	March 4 2022	<ul style="list-style-type: none"><li>• Course Overview and Review of Syllabus</li><li>• Introduction to Testing &amp; Measurement in Epidemiology</li></ul>	Marnin Heisel
2	March 11	<ul style="list-style-type: none"><li>• Ethical Principles in Testing and Measurement</li><li>• Constructing Scales: From Item Development to Assessment of Norms</li></ul>	Marnin Heisel
3	March 18	<ul style="list-style-type: none"><li>• Guest Lecture: An In-Depth Look at Internal Consistency</li></ul>	Professor Emeritus David L. Streiner*
4	March 25	<ul style="list-style-type: none"><li>• The Ins-and-Outs of Reliability and Validity</li><li>• A Brief Introduction to Factor Analysis</li></ul>	Marnin Heisel
5	April 1	<ul style="list-style-type: none"><li>• "Putting it All Together": When to select, when to adapt, and when to create a new scale.</li></ul>	Marnin Heisel
6	April 8	<ul style="list-style-type: none"><li>• Student Presentations</li></ul>	Students

\* Dr. Streiner is the author of the course textbook

## Course Materials

Streiner, D.L., Norman, G.R., & Cairney, J. (2015). Health measurement scales: A practical guide to their development and use (5<sup>th</sup> edition). Oxford University Press.

In addition to weekly readings from the textbook, you may be assigned weekly readings to augment that week's lectures and/or in-class discussion, and you are encouraged to share relevant resources on testing and measurement with your classmates. Lecture slides, assignments, and other relevant information will be posted on the course page (on OWL).

## Methods of Evaluation

Class Participation	20%
Brief Weekly Assignments	20%
Study proposal (due March 25)	20%
Presentation (with handout; April 8)	20%
Final Assignment (due April 15)	20%

Class Participation: Class participation marks will be based upon your class attendance, preparation for class, participation in discussions, and in-class work. This mark will be determined by the instructor with input from you regarding your own participation mark.

Brief Weekly Assignments: You will be asked to complete brief assignments demonstrating your developing understanding of key issues regarding measurement. Some of these assignments may be practical in nature. These assignments will be due by the end of the day on the Friday of each class.

Study Proposal: You will be asked to write a brief proposal for a study relevant to test development and validation. The format will be similar to a grant or funding application, and would focus on proposing the development and initial validation of a new measure, or adaptation or abbreviation of an existing measure (e.g., for use with a new demographic or for a different purpose), or testing the measurement characteristics of an existing measure (e.g., proposing a new validation or replicating an existing validation study). This proposal will be due **March 25<sup>th</sup>** and will be graded by the instructor.

Presentation: You will be asked to give an individual presentation on a published test or rating scale of your choosing. You will select a scale to review (ideally relevant to your interests and/or thesis research, and that is not covered in the course lectures) and present on its background, purpose, the reason for its development, and basic information on the test/measure itself, its format, length, number of items (and factors, if relevant), response options, method of administration, requisite administrator training/background, norms, population(s) of relevance, response characteristics, reliability, validity, and recommendations regarding its use in research and/or other purposes. This sounds like a lot, but is pretty straightforward, and constitutes the typical information found in a scale's user guide or development article. A brief class handout will be required (up to 1 page in length), highlighting the features of the scale in bullet-point form. Presentations will take place in-class on **April 8<sup>th</sup>** and will be graded by the instructor.

Final Assignment: You will also be asked to submit a brief (i.e., 1000-2000 word) overview of the test or scale that you presented in your in-class presentation. In addition to the information you will present in-class, you will be expected to provide a brief review of the literature (with reference list) regarding the test-scale, including its development, validation, and a few key findings.

The final assignment is due no later than **April 15<sup>th</sup>**, and will be graded by the instructor.

Course evaluation will be numeric in format (i.e., you will end up with a total score out of 100%).

### **Missed Work**

If you do not complete your presentation and assignments (without providing the instructor with notice and coming to an agreement regarding late-submission or alternative accommodation), you will receive a 0% for the missed work. Consideration on compassionate grounds may be given by the instructor on a case-by-case basis.

### **Marking Reassessments**

Should you have concerns about a mark you have received on an assignment or test, you are welcome to request a reassessment from the instructor. In order to request a reassessment, please write one paragraph explaining why you believe you deserve a different mark from the one that you received. This will be reviewed by the instructor together with your original work, and may or may not lead to a revision in your mark.

## **Western Academic Policies and Statements**

### **Absence from Course Commitments**

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](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.

### **Copyright and Audio/Video Recording Statement**

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. You must always ask permission to record another individual and you should never share or distribute recordings.

### **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/>.

Registrarial Services: <http://www.registrar.uwo.ca>

USC Student Support Services: <http://westernusc.ca/services/>

Academic Support and Engagement: <http://academicsupport.uwo.ca/>

SGPS Life & Community web page: [https://grad.uwo.ca/life\\_community/self/index.html](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 Chair), or other relevant administrators in their unit. Health and Wellness-related information and services are available at <https://www.uwo.ca/health/>.

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

### **Accessible Education Western (AEW)**

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 strongly encouraged to register with Accessible Education Western (AEW), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW 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.

More information and access to services is available on the AEW website:

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

### **Department & Faculty Offices**

The Department of Epidemiology and Biostatistics is located on the third floor of the Western Centre for Public Health & Family Medicine (PHFM) on Western University's Main Campus.

### **Technology Requirements**

You are responsible for all required course materials and announcements posted to the course's OWL website. Please ensure after the first class that when you log in you are able to access the course site. A copy of the course outline will be available on both OWL and the departmental website.