

**POPM 6960**  
**Systematic reviews and meta-analysis**  
**Winter 2020**

***Course coordinator:***

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***Other instructors:***

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***Course description:***

This course covers the use of systematic reviews in animal health and public health, the steps in conducting a systematic review, and quantitative synthesis (meta-analysis). The course will combine didactic lectures with “flipped teaching” sessions. For the flipped teaching sessions, students will be expected to view 3-5 short videos on the session materials and complete a short quiz prior to the class session (videos and quizzes will be posted on courselink). During the class sessions, students will work through practical examples related to the course materials. The meta-analysis section of the course will provide basic instruction in how to conduct meta-analysis using the software program “R”. Evaluation will include pre-class quizzes, class participation, a final group project and a final examination.

***Pre-requisite courses:***

POPM 6200: Epidemiology I.

POPM 6520: Introduction to Epidemiology and Statistics or a graduate level statistics course

Laptop computers will be used for some sessions and for the final exam. If students don't have access to a laptop computer, they should contact the instructor within the first week of classes to create an alternative learning plan.

***Class sessions:***

There will be 2 in-class sessions (80 minutes each); Mondays and Fridays, 8:30 - 9:50. Room TBD.

### ***Learning outcomes:***

By the end of this course, students should have demonstrated the ability to:

1. Differentiate between scoping studies, systematic reviews, meta-analysis, and network meta-analysis.
2. Describe the types of questions for which a systematic review is appropriate and the types of research questions that cannot be addressed by a systematic review.
3. Design a protocol for a systematic review of an intervention question.
4. Identify the relation between the steps of a systematic review and the reduction of bias at the review level.
5. Describe the components of a pair-wise meta-analysis.
6. Conduct a critical appraisal of a systematic review and meta-analysis.

### ***Overview of topics to be covered:***

Session	Date	Topic
1	Monday Jan.6	Knowledge synthesis methods
2	Friday Jan10	Introduction to SRs, types of questions that can be addressed with systematic reviews, protocols
3	Monday Jan13	<b>Defining the question and eligibility</b>
4	Friday Jan 17	<b>Suitable study designs to address systematic review questions</b>
5	Monday Jan 20	<b>Eligibility to searching</b>
6	Friday Jan 24	<b>Searching the literature</b>
7	Monday Jan 27	<b>Relevance screening</b>
8	Friday Jan31	<b>Extracting data on key elements</b>
9	Monday Feb 3	<b>Extracting data on outcomes</b>
10	Friday Feb 7	<b>Extracting data: process and reporting</b>
11	Monday Feb 10	<b>Risk of bias - RCTs</b>
12	Friday Feb 14	<b>Risk of bias - observational and prevalence</b>
	FEB 17 - 21	<b>READING WEEK - NO CLASSES</b>
13	Monday Feb 24	Approaches to analysis for intervention questions - qualitative
14	Friday Feb 28	<b>Scoping reviews</b>
15	Monday March 2	Lecture & Lab in Meta-analysis - Introduction
16	Friday March 6	Lecture & Lab in Meta-analysis - Binary Outcome
17	Monday March 9	Lecture & Lab in Meta-analysis - Fixed vs. Random Effects
18	Friday March 13	Lecture & Lab in Meta-analysis - Continuous Outcome
19	Monday March 16	Lecture & Lab in Meta-analysis - Subgroup Meta-Analysis

20	Friday March 20	Lecture & Lab in Meta-analysis – Meta-Regression
21	Monday March 23	Lecture & Lab in Meta-analysis – Bias
22	Friday March 27	<b>Quality assessment of SRS – AMSTAR</b>
23	Monday March 30	<b>Interpreting and presenting the results: GRADE and Summary of Findings tables</b>
24	Friday April 3	Introduction to indirect comparisons and network meta-analysis

Bolded sessions are the “flipped” sessions

\* Lectures on each of the stages of a systematic review / meta-analysis will include a discussion of how to report these steps (methods and results sections) in a systematic review publication, based on recommendations of the PRISMA statement. Although not explicitly stated for each class session, an ability to describe appropriate reporting for each stage of the systematic review process is an overall learning objective for the course.

***Evaluation:***

Pre-class quizzes for flipped class sessions (26% of final mark – i.e., each quiz / flipped session assignment is worth 2% of your final mark). Please follow the course outline to identify flipped sessions. Quizzes will be available on courselink at least 2 weeks before the class session and must be completed by 11 pm the evening prior to the corresponding class session. Late quizzes will not be accepted and a mark of zero will be given for each incomplete quiz.

Final project (44% of final mark). Students will be required to develop a protocol for a systematic review of an intervention question. Late assignments will be penalized by 10% per day (or part).

Final exam (30% of final mark). The exam will focus on the meta-analysis component of the course, but also may include some questions from other components of the course.