Epid 804 – Intermediate Epidemiology

Course Summary
This course focuses on advanced issues in the design, conduct, analysis and interpretation of epidemiologic studies. Material will be presented in lecture and seminar format. The material presented will be augmented by background readings from the current literature, practical applications, and seminar discussions.

Prerequisites
Course prerequisites are Epid 801 (Intro to epidemiology) and Epid 821 (Intro to Biostatistics).

Instructor: Will King, kingw@queensu.ca
TAs: Rebecca Hansford

Format
These sessions will be a combination of lecture, interactive discussion and small break out group discussion

Mondays – 9 to 10:30 Carruther’s Hall Rm 102
Wednesdays - Come for 9 to 10:20, or for 10:30 to 11:50 (one or the other). This will make for a smaller and more interactive session on Wednesday in Carruther’s Hall Rm 102

TA Office Hours
TA office hours will be scheduled prior to the due dates for assignments and exams.

Readings
Readings will come from journal articles and the following epidemiologic texts:
- Szklo and Nieto, Epidemiology: Beyond the Basics
- Armstrong, White and Saracci, Principles of Exposure Measurement in Epidemiology
- Rothman, et al. Modern Epidemiology (ebook at Queen’s)
- Kelsey, Methods in Observational Epidemiology

The readings will be available on the class website. No text is required for this course. However, you may find it useful to purchase a text that complements the material covered in this course such as Szklo, Epidemiology beyond the Basics.

Evaluation

<table>
<thead>
<tr>
<th>Project</th>
<th>Value</th>
<th>Assigned</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment #1</td>
<td>15%</td>
<td>Jan 25</td>
<td>Feb 3</td>
</tr>
<tr>
<td>Assignment #2</td>
<td>15%</td>
<td>Feb 13</td>
<td>Feb 28</td>
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<tr>
<td>Midterm Exam</td>
<td>30%</td>
<td>Mar 15</td>
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<tr>
<td>Assignment #3</td>
<td>10%</td>
<td>Mar 20</td>
<td>Mar 28</td>
</tr>
<tr>
<td>Final paper - Research question</td>
<td>5%</td>
<td>Mar 22</td>
<td>Apr 4</td>
</tr>
<tr>
<td>Research Methods</td>
<td>25%</td>
<td>Mar 22</td>
<td>Apr 18</td>
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</tbody>
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Expectations of students
1) Read the assigned readings prior to class
2) Take an active part in class discussions
3) Hand in assignments on the due date
4) Demonstrate independent work
5) Academic Integrity
## Schedule

### Introduction
1. Introduction - Intermediate endpoints, Conceptual models, Confounding, Mediation, Effect modification/interaction  
   - Jan 9

### Study Design
2. Cohort Studies  
   - Jan 11
3. Cross-sectional studies  
   - Jan 16
4. Case-control and nested case-control studies  
   - Jan 18
5. Alternative Designs (Case-crossover, Quasi-experimental, Phase IV trials)  
   - Jan 23
6. Selection and information Bias  
   - Jan 25
7. Randomized Controlled Trials / Intervention Studies *(Asynchronous)*  
   - Jan 30
8. Ethical issues in epidemiologic research *(Rebecca)*  
   - Feb 1
9. Ecologic Studies  
   - Feb 6

### Exposure Assessment, reliability and validity
10. Framework for exposure assessment  
    - Feb 8
11. Measurement Error, reliability and validity, effect of misclassification  
    - Feb 13

### Study Population, Confounding and Interaction
12. Selection of study populations and planning sample size, minimal detectable  
    - Feb 15

#### Reading week 20 and 22
13. Subject selection, sampling, and recruitment  
    - Feb 27

### Epidemiologic issues in analysis and interpretation
14. Confounding  
    - Mar 1
15. Interaction  
    - Mar 6
16. Mediation  
    - Mar 8

### Midterm
17. Exam review  
    - Mar 13
18. Exam  
    - Mar 15

*Exam date will be confirmed after determining schedule in other courses*

19. Population Attributable Risk  
    - Mar 20

### Epidemiologic issues in analysis and interpretation … continued
20. Analysis and interpretation of case-control data, including modelling  
    - Mar 22
21. Analysis and interpretation of cohort data, including modelling strategies  
    - Mar 27

### Knowledge Synthesis, Risk Communication, Ethics, Application
22. Application of study design material  
    - Mar 29
23. Meta-analysis  
    - Apr 3
24. Final paper discussion  
    - Apr 5