1 Instructor

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2 AIMS & OBJECTIVES

2.1 Calendar Description

Major topics and methods in the systematic review of the scientific literature, meta-analysis and empirical modelling for animal sciences will be covered. Students learn via hands-on ‘doing’ with reflection on their work via the execution of a meta-analysis in their topic area and preparation of a meta-analysis manuscript.

2.2 Course Description

Major topics and methods in the systematic review of the scientific literature, meta-analysis and empirical modelling for animal sciences will be covered. Topics include strategies for systematically locating and extracting data from the literature, database development and management, model development and statistical analysis, model evaluation and scientific paper writing. This is an experiential learning-based course where students, in partnership with their advisor, identify a topic for which the student will conduct a meta-analysis and draft a scientific paper during the course.

2.3 Learning Outcomes

Upon successful completion of this course, students will have demonstrated the ability to:
1. Conduct a systematic literature review.
2. Critically analyse published literature.
3. Construct a database from a systematic literature review.
4. Apply meta-analysis methods for modelling of categorical, linear and non-linear data types collected from the literature.
5. Assess and measure the appropriateness of method options used in meta-analysis.
6. Assess model goodness-of-fit and troubleshoot data and coding problems.
7. Evaluate and compare models (extant and developed)
8. Interpret and judge the biological significance of equations developed.
9. Accurately and effectively communicate scientific analyses in written and oral form.

2.4 Instructor’s Role and Responsibility to Students
The instructor will lecture in an interactive discussion-based manner, provide feedback to students, help with project direction, oversee/prepare applied learning exercises and mark assignments.

3 Teaching and Learning Activities

3.1 Timetable
Lectures: 1.5 hours per week
Labs: 1.5 hours per week

3.2 Course Topics and Schedule (*A denotes an affiliated assignment, see 5.1 below)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction</td>
</tr>
<tr>
<td>Week 2</td>
<td>Module 1: Conducting a systematic literature review*A1</td>
</tr>
<tr>
<td>Week 3</td>
<td>Module 2: Data visualization &amp; exploration</td>
</tr>
<tr>
<td>Week 4</td>
<td>Module 3: Mixed models for meta-analysis – linear regression</td>
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<tr>
<td>Week 5</td>
<td>Module 4: Mixed model fitting &amp; outlier detection*A2</td>
</tr>
<tr>
<td>Week 6</td>
<td>Module 5: Mixed models for meta-analysis – categorical data</td>
</tr>
<tr>
<td>Week 7</td>
<td>Module 6: Mixed models for meta-analysis – non-normal data*A3</td>
</tr>
<tr>
<td>Week 8</td>
<td>Module 7: Principle component analysis</td>
</tr>
<tr>
<td>Week 9</td>
<td>Module 8: Mixed models for meta-analysis – non-linear regression</td>
</tr>
<tr>
<td>Week 10</td>
<td>Module 9: Model evaluation &amp; presentation – statistical &amp; graphical*A4</td>
</tr>
<tr>
<td>Week 11</td>
<td>Module 10: Science communication: writing a meta-analysis paper</td>
</tr>
<tr>
<td>Week 12</td>
<td>Final Project presentations</td>
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</tbody>
</table>
4 LEARNING RESOURCES

4.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ANSC*6550 Courselink site. You are responsible for checking the site regularly.

4.2 Required Resources

Course materials:
- Course notes will be used during the course (both available in the course’s webpage)
- Extra pertinent information, such as papers, chapters of books, etc. will be accordingly recommended and placed on the course’s webpage
- Students are advised to take their own notes during lectures

5 ASSESSMENT

5.1 Dates and Distribution

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Weighting</th>
<th>Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1 (A1)</td>
<td>4 weeks ACS</td>
<td>5%</td>
<td>1-3, 9</td>
</tr>
<tr>
<td>- Presentation of literature search strategy/search terms, literature funnel and database template populated with at least 10 studies</td>
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<tr>
<td>Assignment 2 (A2)</td>
<td>6 weeks ACS</td>
<td>5%</td>
<td>4-6, 9</td>
</tr>
<tr>
<td>- Presentation of mixed-model analysis of sample dataset, identification of optimal fixed-random structure &amp; outliers</td>
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<td></td>
<td></td>
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<tr>
<td>Assignment 3 (A3)</td>
<td>8 weeks ACS</td>
<td>5%</td>
<td>4-6, 9</td>
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<tr>
<td>- Presentation of data analysis proposal, including assessment of data type, appropriate analysis approach, and planned comparisons</td>
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</tbody>
</table>
### Assignment 4 (A4)
- Presentation of model evaluation (statistical and graphical)
  - 11 weeks ACS
  - 5%
  - 7, 9

<table>
<thead>
<tr>
<th>Project Presentation</th>
<th>12 weeks ACS</th>
<th>30%</th>
<th>1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Paper</td>
<td>14 weeks ACS</td>
<td>50%</td>
<td>1-10</td>
</tr>
</tbody>
</table>

ACS = After the Course Starts

#### 5.2 Assessment Descriptions

Assignments 1-4 will encompass an oral presentation of findings and submission of statistical code. Assignment code and outcomes will be made available to the instructor the day before the presentation.

The final Project Presentation will be 15 minutes long, plus a 10 minute question period. Presentation slides will be made available to the instructor and students the day before the presentation.

The final Project Paper will be structured as a journal article using an example/template from a relevant journal, and will be submitted approx. one week after the presentation. This will allow students to integrate feedback from presentations into reports. The reports will be written and evaluated individually. The topic of each project will be decided between the student and their advisor and shared with the instructor in the 3rd week of class.

#### 5.3 Course Grading Policies

**Accommodation of Religious Obligations:** If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the graduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: [https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2228.shtml](https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2228.shtml)

**Passing grade:** In order to pass the course, students must obtain a grade of 65% or higher on the total mark of all assessments.

### 6 UNIVERSITY STATEMENTS

#### 6.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly; e-mail is the official route of communication between the University and its students.
6.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals:
[https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml]

Graduate Calendar - Grounds for Academic Consideration:
[https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2182.shtml]

6.3 Drop Date

Courses that are one semester long must be dropped by the end of the last class day; two-semester courses must be dropped by the last class day of the second semester. The regulations and procedures for changing graduate course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar – Dropping Courses:
[https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml]

Graduate Calendar – Registration Changes:
[https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml]

6.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments; you may be asked to resubmit work at any time.

6.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least seven days in advance and not later than the 40th class day.

More information can be found on the SAS website [https://www.uoguelph.ca/sas]

6.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on
academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar – Academic Misconduct:
[https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml]

Graduate Calendar – Academic Misconduct:
[https://www.uoguelph.ca/registrar/calendars/graduate/2018-2019/genreg/sec_d0e2632.shtml ]

6.7 Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

6.8 Resources

The Academic Calendars [https://www.uoguelph.ca/academics/calendars] are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.