Course Syllabus

Instructor Information
Instructor: Dr. Kirstie Hawkey  
E-mail: hawkey@cs.dal.ca  
Office: 436  
Office Hours: Friday: noon-2pm or tinyurl.com/khmeetings
Class Time: Friday, 2:35-5:25  
Room #: Computer Science Lab 4
Tutorial  
Monday: 10:35-11:55  
Room #: Computer Science Lab 2
Course  
Homepage: web.cs.dal.ca/~hawkey/rms  
Course TA: Anwar Alhenshiri  
E-mail: anwar@cs.dal.ca  
Course Mail List: all-cs6903@cs.dal.ca

Course Description
This class is designed to provide computer science students with an understanding of the principles of empirical science as they relate to computer science research. The goal is for the student to determine the research methods most appropriate for their research area and to be able to design simple to moderately complicated research studies. The course covers both quantitative and qualitative research issues and will provide a practical introduction to the statistics through hand-on tutorials. In addition, this course will provide the basis for critical reading of research findings in the literature and students will gain experience with scientific writing.

This course will introduce students to the principles of empirical science. It will teach students how to assess the validity of other researchers’ articles, and at the same time, enable students to validate their own research. The topics presented to students in lectures will include: the concept of scientific research, variables, validity, control, true experiments (single factor design, factorial design), quasi experiments, non-experimental research (surveys, interviews and observations), ethics, writing, plagiarism, and publishing. The topics presented to students in tutorials include developing a research question, introduction to statistics, descriptive statistics, hypothesis testing, inferential statistics, data preparation, and software packages. Tutorials will include lecture/discussion components and hands-on application of statistical procedures with exercises in SPSS.
Required Texts and Resources

Required text:
Reading Statistics and Research
Shuyler W. Huck
(any edition is fine)

Recommended text:
SPSS Survival Manual
Julie Pallant

Furthermore, a course archive of additional material available online will be developed by the instructor and students. Additionally, students will be assigned weekly readings of research papers that demonstrate the topics under discussion.

The primary source of communication will be in class. Attendance in class is expected; if you must miss a class, please notify the instructor and arrange with a fellow student to obtain any notes. Additional communications will be posted to the course email list, which comprises the instructor’s and students' CS email accounts. It is the student’s responsibility to check their CS email account on a regular basis. If you do not know how to access your CS email account please contact the CS help desk or read the following FAQ located at: http://www.ug.cs.dal.ca/studentservices/faq/technical_services/e-mail/email.php

Important Dates
- Midterm Exam: October 28, 2011
- Final Exam: TBA in the period of December 9-20, 2011
- Final Withdrawal Date without academic penalty: October 7, 2011
- Final Withdrawal Date with academic penalty: November 7, 2011
- Deadlines: Individual assignments:
  - In-class presentation: Nov 4-Dec 2;
  - Research paper: Draft, Nov 4; Final version December 9;
  - Self-study module: December 2

Evaluation

Evaluation Scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>Participation</td>
<td>15</td>
</tr>
<tr>
<td>Assignments (5)</td>
<td>20</td>
</tr>
<tr>
<td>Self-Study Module</td>
<td>10</td>
</tr>
<tr>
<td>Research Paper/Presentation</td>
<td>15</td>
</tr>
<tr>
<td>Mid-Term</td>
<td>15</td>
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<tr>
<td>Final</td>
<td>25</td>
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<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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Participation: Students are expected to attend the lectures and labs and participate in discussion of the materials and in-class exercises. Each week, a research paper will be assigned that demonstrates the topic under discussion. Students are expected to read the research paper and submit two questions/comments for discussion prior to class. There will be period quizzes during the tutorials and lectures to evaluate students’ comprehension of assigned reading materials.

Assignments: There will be 5 assignments during which students will develop a research question (assignment 1) and then develop an appropriate research methodology that considers the issues of variables & measurement (assignment 2), experimental validity (assignment 3), hypothesis testing (assignment 4), and control (assignment 5).

Self-study module: The self-study module provides students with an opportunity to dive more deeply into an area of research methodology or statistics. The topics and appropriate learning objectives will be set by the students with approval of the instructor/TA.

Research paper/presentation: The research paper will provide students with the opportunity to present the research methodology that they have developed through the assignments at a level more suited for publication. It will include an introduction that motivates the research problem, a related work section, their proposed research methodology, and a discussion of the benefits and limitations of their approach. A draft of the paper will be due mid-semester to provide early feedback and to give students the opportunity to incorporate an editing cycle into their writing process. During the last month of class, students will sign up to give a 10 minute in-class presentation of their topic. Any feedback provided should be incorporated in the final version of the paper.

Examinations: The mid-term and final exam will evaluate students understanding of the concepts discussed in class and their ability to apply that understanding to research scenarios.

Midterm and Final Exam Requirements
- Photo ID is required
- Closed book. No dictionaries, notes, calculators, cell phones, PDAs, talking slide rulers, or other electronic aids allowed.

Late Policy and Submission requirements
- With the exception of the reading questions, which are due at 5pm on Thursdays, all submissions are due at the beginning of class on Friday.
- Late submissions will not be accepted.
- All materials must be submitted both in paper and electronic form.
Tentative List of Topics

Lecture topics (weekly 3 hour lecture):
1. Science & Research: Why You Need This Course
2. Developing a research questions; Writing, Publishing, Plagiarism
3. Variables
4. Validity
5. Control
6. True Experiment: Single-Factor Design
7. True Experiment: Factorial Design
8. In-Class Midterm, followed by discussion of mid-term questions
9. Quasi Experiment
10. Non-Experimental Research: Surveys
11. Non-Experimental Research: Interviews and Observations
12. Ethics, Course Summary

Tutorial topics (weekly 1.5 hour tutorial/lab):
1. A gentle introduction to statistics
2. Descriptive statistics
3. Hypothesis testing
4. Inferential Statistics, Part 1
5. Mid-term review
6. Inferential Statistics, Part 2
7. Data Preparation
8. Software Packages
9. General and Self-Study Modules, Q&A
10. General and Self-Study Modules, Q&A
11. Final exam review
Academic Integrity

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean?
Academic integrity means being honest in the fulfillment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. “Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs.” (see Intellectual Honesty section of University Calendar)

How can you achieve academic integrity?
- Make sure you understand Dalhousie’s policies on academic integrity.
- Give appropriate credit to the sources used in your assignment such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images.
- Use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor [http://www.library.dal.ca/How/RefWorks](http://www.library.dal.ca/How/RefWorks)
- Do not download the work of another from the Internet and submit it as your own.
- Do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor.
- Do not write an examination or test for someone else.
- Do not falsify data or lab results.
These examples should be considered only as a guide and not an exhaustive list.

What will happen if an allegation of an academic offence is made against you?
1. I am required to report a suspected offence. The full process is outlined in the Discipline flow chart, which can be found at: [http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf](http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf)
2. Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors.
3. The AIO decides whether to proceed with the allegation and you will be notified of the process.
4. If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved.
5. If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help?
- If you are ever unsure about ANYTHING, contact myself.
- The Academic Integrity website [http://academicintegrity.dal.ca](http://academicintegrity.dal.ca) has links to policies, definitions, online tutorials, tips on citing and paraphrasing.
- The Writing Center provides assistance with proofreading, writing styles, citations.
- Dalhousie Libraries have workshops, tutorials, citation guides, Assignment Calculator, RefWorks, etc.
- The Dalhousie Student Advocacy Service assists students with academic appeals and student discipline procedures.
- The Senate Office provides links to a list of Academic Integrity Officers, discipline flow chart, and Senate Discipline Committee.

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1 Based on the sample statement provided at [http://academicintegrity.dal.ca](http://academicintegrity.dal.ca).