

# Syllabus - MATH 2400

## Applied Graph Theory

### Fall 2013

**Instructor:** Dr. M. Davidson  
431 Machray Hall  
204 474 8090  
davidson@cc.umanitoba.ca

#### Office Hours:

Monday, Wednesday, 2:00 - 3:00 ;  
Thursday 9:00 - 10:00

#### Lectures:

315 Buller  
12:30 - 1:20 Monday, Wednesday, & Friday

**Textbook:** Joan M. Aldous and Robin J Wilson, *Graphs and Applications, an introductory approach*, Springer, 2000.

#### Tentative Topics:

- ★ **Chapter 1:** Introduction to graphs, digraphs, networks
- ★ **Chapter 2:** graphs, subgraphs, degrees, paths, cycles, regular, bipartite, four cubes problem
- ★ **Chapter 3:** Eulerian graphs, Hamiltonian graphs, knight's tour, Gray codes
- ★ **Chapter 4:** Digraphs, rotating drum, tournaments
- ★ **Chapter 5:** Adjacency matrices, walks, incidence matrices
- ★ **Chapter 6 & 7:** Trees, spanning trees, rooted trees, labelled trees, binary trees, chemical trees
- ★ **Chapter 8 & 9:** Algorithms, traveling salesman problem, shortest path algorithm, longest path algorithm, scheduling
- ★ **Chapter 10:** (as time permits, selected topics) Path and connectivity, Menger's Theorem
- ★ **Chapter 11:** Planarity, Euler's Formula, Kuratowski's Theorem
- ★ **Chapter 12 & 13:** (as time permits, selected topics) Vertex colourings, edge colourings

#### Evaluation of Student Performance:

Participation	5 %	classroom participation, discussion of homework.
Midterm Tests	40%	Two test, written in class
Final Examination	55%	(3 hours) - to be scheduled during the final examination period

**Midterm Tests:** There will be midterms in class on:  
Wednesday, October 9<sup>th</sup> and Friday, November 8<sup>th</sup>  
Each midterm will count for 20% of your grade.

**Website:**

<http://home.cc.umanitoba.ca/~davidsom/>

**Notes:**

- ◇ The Voluntary Withdrawal Deadline is November 13<sup>th</sup>.
- ◇ Note that past examinations are to be used for practice only: there is no guarantee that your examinations in this course will in any way be similar.
- ◇ If you miss the midterm, you will be assigned a grade of 'zero' unless reasons and acceptable supporting evidence are provided. There will be no make-up midterms.
- ◇ Calculators will NOT be permitted during midterms or final exam.

## **Faculty of Science Statement on Academic Dishonesty**

The Faculty of Science and The University of Manitoba regard acts of academic dishonesty in quizzes, tests, examinations, laboratory reports or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence.

Acts of academic dishonesty include, but are not limited to bringing unauthorized materials into a test or exam, copying from another individual, using answers provided by tutors, plagiarism, and examination personation.

Note: cell phones, pagers, PDAs, MP3 units or electronic translators are explicitly listed as unauthorized materials, and must not be present during tests or examinations.

Penalties that may apply, as provided for under the University of Manitoba's Student Discipline ByLaw, range from a grade of zero for the assignment or examination, failure in the course, to expulsion from the University. The Student Discipline ByLaw may be accessed at:

[http://umanitoba.ca/admin/governance/governing\\_documents/students/868.htm](http://umanitoba.ca/admin/governance/governing_documents/students/868.htm)

Suggested minimum penalties assessed by the Faculty of Science for acts of academic dishonesty are available on the Faculty of Science webpage:

[http://umanitoba.ca/faculties/science/resources/Discipline\\_Penalties\\_Table\\_Jul09.pdf](http://umanitoba.ca/faculties/science/resources/Discipline_Penalties_Table_Jul09.pdf)

All Faculty members (and their teaching assistants) have been instructed to be vigilant and report all incidents of academic dishonesty to the Head of the Department.