MATH 6348 – Fall 2014

Graph Colouring

Instructor

- Name: Dr. David Pike
- Office: Henrietta Harvey Building – Room 2024
- Phone: 864-8096
- Email: *dapike@mun.ca*

- Office Hours: 15:15–16:00 on Tuesday and Thursday, or by appointment

Course Info

- Location: Henrietta Harvey Building – Room 3013
- Class Times: 14:00–15:15 on Tuesday and Thursday
- Prerequisites: an introductory (typically undergraduate) course in graph theory

Reference Books

The following books are held within the collection of the QEII Library:

- G. Chartrand and P. Zhang. Chromatic Graph Theory. CRC Press, 2009. [483 pages]
- R. Diestel. Graph Theory, third edition. Springer, 2005. [410 pages]
- T.R. Jensen and B. Toft. Graph Coloring Problems. Wiley, 1994. [295 pages]
- M. Molloy and B. Reed. Graph Colouring and the Probabilistic Method. Springer, 2002. [326 pages]
- E.R. Scheinerman and D.H. Ullman. Fractional Graph Theory. Wiley, 1997. [211 pages]
- H.P. Yap. Total Colourings of Graphs. Springer, 1996. [131 pages]

Course Outline

- Edge Colourings: types of edge colourings (proper, equalised, equitable, balanced), Vizing's theorem, overfull graphs, Fournier's theorem, the Chetwynd-Hilton-Hoffman theorem, critical graphs
- Vertex Colourings: bounds on the chromatic number, Brooks' theorem, Hadwiger's conjecture, Reed's conjecture, colour-critical graphs, Turán's theorem, the Erdős-Faber-Lovász conjecture
- Total Colourings: the total colouring conjecture, total colourings of complete and complete multipartite graphs, classification of type 1 and type 2 graphs, total colourings of planar graphs

- Fractional Colourings: bounds on the fractional chromatic number, proof of the Erdős-Faber-Lovász conjecture, proof of Reed's conjecture, fractional edge colouring, fractional total colouring

Method of Evaluation and Related Policies

- Assignment problems will be regularly given.

  Your work should reflect clear content as well as coherent and organised structure. What this effectively means is that your work should be clear to follow and should show a logical progression of thought. If you have to guide me through your work in order to point out your thought process (even if your work is correct), then you shouldn't expect to get full credit.

- Plagiarism, cheating, and academic dishonesty will not be tolerated. The minimum penalty for any form of cheating on an assignment, test, etc. will be a grade of zero for the corresponding assignment, test, etc.

- Be aware that not all learning takes place in the classroom. Expect to devote personal time to ensure that you fully comprehend and understand the material. This will likely entail reading from the textbook, consulting with additional resources, engaging in interactive discussions, as well as doing exercises beyond those which are assigned.

- Final course grades will be based upon the following scheme

Homework:	25
Midterm Exam(s):	25
Final Exam:	50
	100

- Requests for "extra-credit" projects will be denied. Put simply, your grade will be based upon the required course-work as indicated above.