

## GRAPH THEORY 2:00-3:20PM TTH FALL 2015 SH309

- Instructor: Jonathan White
- E-Mail: JWhite@Coe.Edu
- Web Page: <http://public.coe.edu/~jwhite/>
- Office: Stuart 316
- Office Hours: MTWF 9:30-10:30am, Th 1:00-1:50pm, and by appointment
- Office Phone: 399-8280
- Home Phone: 362-3350 (between 7am and 10pm)
- Text: The main text will be *Graph Theory: A Problem Oriented Approach*, Daniel Marcus, MAA.
- Problem Sets & Quests: There will be several problem sets and quests (which are similar to problem sets, but you can keep trying) through the semester. Together these will be worth 150 points.
- Participation: Successfully presenting a problem in class will earn 5 points, and absences cost 5 points each, up to a total of 100 points.
- Project: Students will undertake a major project during the semester, which may involve a paper, a coding project, or a significant amount of independent investigation. Topics will be selected in consultation with the instructor, and there will be considerable freedom to fit individual interests within the scope of the class. These projects will be worth 50 points, and are due by the last day of class.
- Math Culture Points: Up to 100 Math Culture Points may be earned by participating in various activities outside of class, as detailed on page 3 of this syllabus.
- Examlets: There will be two small in-class examlets administered during class time. The dates of these are indicated in the schedule on the back side of this sheet. These examlets will be worth 50 points each.
- The final exam will be held during finals week at the date and time indicated on the back side of this sheet. The final will be worth 100 points.
- Grading: Grading will approximately follow a [92.0%,  $\infty$ )  $\rightarrow$  A, [90%, 92%)  $\rightarrow$  A-, [87%, 90%)  $\rightarrow$  B+, [82%, 87%)  $\rightarrow$  B, [80%, 82%)  $\rightarrow$  B-, [77%, 80%)  $\rightarrow$  C+, [72%, 77%)  $\rightarrow$  C, [70%, 72%)  $\rightarrow$  C-, [67%, 70%)  $\rightarrow$  D+, [62%, 67%)  $\rightarrow$  D, [60%, 62%)  $\rightarrow$  D-, ( $-\infty$ , 60%)  $\rightarrow$  F scale.
- Makeups: For fairness to those who follow the schedule, makeups for examlets will be allowed only in extenuating circumstances, with documentation and advance notice when humanly possible. Late problem sets will generally not be accepted, and if accepted due to extenuating circumstances will generally be subject to a penalty of 20% of the possible points for each day past due.

This class is intended to serve a variety of different goals, since graph theory is increasingly relevant to serious study in many fields. There is a sizeable core of material which is essential to all, but also peripheral areas which are valuable (often surprisingly so) to some. In order to serve those various groups well, several aspects of the class will be individualizable. Students should think deliberately about which areas to focus on, and particularly use the project as a way of customizing part of the course. I hope you will make the most of the opportunities this presents.

The format of this course will generally be more collaborative, exploratory, and discussion-based than a traditional math class. This can only be successful if all students come to class well-prepared, so please hold up your part. Remember that I'm around to help.

**GRAPH THEORY 2:00-3:20PM TTH FALL 2015 SH309**

**Extremely Tentative Schedule**

Tuesday, 9/1 A: Basic Concepts	Thursday, 9/3 B: Isomorphic Graphs
Tuesday, 9/8 C: Bipartite Graphs	Thursday, 9/10 C: Bipartite Graphs
Tuesday, 9/15 D: Trees & Forests	Thursday, 9/17 E: Spanning Tree Algorithms
Tuesday, 9/22 E: Spanning Tree Algorithms	Thursday, 9/24 F: Euler Paths
Tuesday, 9/29 G: Hamiltonian Paths & Cycles	Thursday, 10/1 <b>Examlet 1</b>
Tuesday, 10/6 No Class – Fall Break	Thursday, 10/8 H: Planar Graphs
Tuesday, 10/13 H: Planar Graphs	Thursday, 10/15 I: Independence & Covering
Tuesday, 10/20 I: Independence & Covering	Thursday, 10/22 J: Connections & Obstructions
Tuesday, 10/27 J: Connections & Obstructions	Thursday, 10/29 K: Vertex Coloring
Tuesday, 11/3 K: Vertex Coloring	Thursday, 11/5 <b>Examlet 2</b>
Tuesday, 11/10 L: Edge Coloring	Thursday, 11/12 L: Edge Coloring
Tuesday, 11/17 M: Matching Theory for Bipartite Graphs	Thursday, 11/19 M: Matching Theory for Bipartite Graphs
Tuesday, 11/24 N: Applications of Matching Theory	Thursday, 11/26 No Class – Thanksgiving
Tuesday, 12/1 O: Cycle-free Digraphs	Thursday, 12/3 P: Network Flow Theory
Tuesday, 12/8 P: Network Flow Theory	Thursday, 12/10 Q: Flow Problems with Lower Bounds
<b>Final Exam – 2pm Friday, 12/18</b>	

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe's faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.

## Math Culture Points

A significant portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below. Note that none of these is mandatory – there are far more opportunities than necessary to earn full credit. You should be able to select activities the are particularly relevant to you.

A portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below:

Activity	Points	Maximum
Chapters of <i>Four Colors Suffice</i>	5	11
Colloquium Attendance	5	–
Colloquium Presentation	5-15	2
Conference Attendance Iowa Section of the MAA	5-15	2
Mathematics Competition Participation Iowa Mathematical Modeling Competition Putnam Competition	10	2
Math Culture Reading Some weeks specific readings will be posted on the course web page With approval, any relevant article from <i>Math Horizons</i> , <i>CMJ</i> , etc.	5	– 3
Math Club Activities (when appropriate) Movies, Speakers, Game Nights, math portion of Playground of Science, etc.	5	--
Volunteer Math Outreach Job Shadowing in any relevant field Working with students at McKinley Middle School, etc.	5 5	2 2

You should plan to spread your participation throughout the semester. In each case above, credit assumes both full participation and posting a brief summary/response on Moodle **in a timely manner**. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event, and **must be submitted within one week of the event**, or within the specified time window for other activities. Up to three units of credit may be submitted after normal deadlines in the “Math Culture – Late” category on Moodle, but otherwise exceptions will not be made without serious extenuating circumstances.

