
MATH 354: APPLIED DISCRETE MATHEMATICS

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Course Description:

MTH 354 Applied Discrete Mathematics (4 credits)
Topics include recurrence relations, graph theory, network models, and combinatorial circuits. Prerequisite: MTH 232 or MTH 253 or MTH 254 with a grade of C- or better.

Instructor Office Hours:
Tuesdays 10:00 - 12:00
Wednesdays 10:00 - 12:00
Thursdays 10:00 - 11:00

You do not need to make an appointment to come to office hours. At times other than my listed office hours, you are welcome and encouraged to call or email me with questions about the course. If you have scheduling conflicts with my office hours and would like further help, please let me know.

Course Materials:

- Text: Discrete Mathematics
  ISBN-13: 978-0-13-159318-3
  Author(s): Richard Johnsonbaugh
  Publisher: Prentice Hall
- Access to Moodle: `http://online.wou.edu/`. You should automatically be enrolled in the Moodle course if you successfully enrolled in the course.
- Calculator − A graphing calculator is highly recommended for this course, namely a TI-83 or TI-84. Please see me if you are considering purchasing a new calculator.

Expected Learning Outcomes:

- Understand recurrence relations and applications to analysis of algorithms
- Understand the basics of graph theory, including paths, cycles, trees and isomorphisms
- Understand properties of graphs, including hamiltonian, eulerian and planarity
- Understand network models and relevant algorithms
- Understand combinatorial circuits and properties

Course Policies

ATTENDANCE: Attendance is absolutely important to be successful in this course. If you miss class, you are responsible for the missed material and there will be no opportunities to make-up daily in-class assignments.

CLASSROOM BEHAVIOR: Please refer to the Standards of Conduct in the WOU catalog. In particular, please read `http://www.wou.edu/las/natsci_math/math/academicdishonesty.php`

GRADING:

- Written Homework – Written homework will be assigned and collected weekly. It is imperative for your success in the class that you work the homework as assigned and keep up with your study of the material. Written homework assignments will be due at the beginning of the designated class. *No late homework will be accepted under any circumstances.* Your lowest score of the approximately 9 assignments will be dropped.

- In-class work – Each week one or more in-class activities will be assigned. Often these will be due by the end of the class period. At times it will be possible to work in groups, but you should be prepared to work individually. *No late work will be accepted under any circumstances.* It is imperative that you are in class and actively participating to be successful in this class. Your lowest score will be dropped.

- Final Project – There will be a final project in lieu of a final exam. More details will be provided around week 7 of the term.

- Weekly Discussion – Each week I will post weekly discussion questions. You must post your initial answer by Thursday each week. After your initial post, you will see the posts of others in your group. You are welcome to have a discussion about the accuracy of your answers. Then you must post again by the end of Sunday with your final answer. The hope is that you have a discussion about questions, so then everyone in your group ends up getting the questions correct.

- Exams − There will be two midterm exams. Tentative dates for the exams are

  - Exam 1 – in-class Week 4ish
  - Exam 2 – in-class Week 10ish

  Makeup exams are generally not given. If you must miss an exam due to a documented emergency or a documented university sanctioned absence from class please inform me ASAP. Cell phones may not be used as calculators during an exam and must be turned off.

- Grades − The standard grading scale will be used with each component worth approximately:

Component	%
Written Homework	20
In-class work	15
Weekly Discussion	10
Exam 1	20
Exam 2	20
Final Project	15

Tentative Schedule

Schedule of Topics (sections in text)	
Week 1	Introduction to Recurrence Relations (7.1) Solving Recurrence Relations (7.2) Solving Recurrence Relations (7.2)
Week 2	Applications to Analysis of Algorithms (7.3) Introduction to Graph Theory (8.1) Paths and Cycles (8.2)
Week 3	Hamiltonian Cycles and the Traveling Salesperson Problem (8.3) A Shortest-Path Algorithm (8.4) A Shortest-Path Algorithm (8.4)
Week 4	Representations of Graphs (8.5) Exam 1
Week 5	Isomorphisms of Graphs (8.6) Planar Graphs (8.7) Introduction to Trees (9.1), Terminology and Characterizations of Trees (9.2)
Week 6	Spanning Trees (9.3) Minimal Spanning Trees (9.4) Binary Trees (9.5)
Week 7	Tree Traversals (9.6) Exam 2
Week 8	Introduction to Network Models (10.1) A Maximal Flow Algorithm (10.2) The Max Flow, Min Cut Algorithm (10.3)
Week 9	Matching (10.4) Combinatorial Circuits (11.1)
Week 10	Properties of Combinatorial Circuits (11.2) Properties of Combinatorial Circuits (11.2)

RESOURCES:

- TUTORING: Free drop-in tutoring for some material from MTH 232 is available at the Math Center in the library. Please see the schedule at `http://www.wou.edu/las/natsci_math/math/tutor/`. Tutoring is also available through the Learning Center. Information on available services may be found at `http://www.wou.edu/provost/aalc/learning/procedures.php`.

- WOLF CONNECT SYSTEM (WCS): If the instructor determines your performance in this class is placing you at academic risk, you may be referred to Western's Student Success Specialist. The specialist will offer to work with you to address issues and develop a student success strategy. Regardless of whether a referral has or has not been made, you are ultimately responsible for tracking your own progress in this course.

- INCOMPLETES: An Incomplete can only be granted for a student who is passing a class and has a documented emergency that prevents them from completing the course, after Friday of the seventh week of class, which is the last day for dropping a course with W grade.

- Learning Disabilities: If you have a documented learning disability, please talk to me during the first few days of class; I will be more than happy to accommodate you in any way that I can. If you have a documented disability that requires academic accommodations or auxiliary aids at Western Oregon University, please contact the Office of Disability Services (ODS). ODS is located in the APSC, Room 405, Phone 503-838-8250 V/TTY or email at ODS@wou.edu.

- Veterans and Active Military Personnel: Veterans and Active Military Personnel with special circumstances are welcome and encouraged to communicate these, in advance if possible, to the instructor.