Math 236 Syllabus | Spring 2018 | Laurel Langford
Discrete Mathematics | laurel.langford@uwrf.edu
Section 1; Credits: 4 | http://langfordmath.com/

Office hours (getting help): I will be available in my office to answer questions (206E NH; office phone 715-425-4360) MTWF 10:00-10:45, MWF 2:00-2:45. I am around a lot during the day when I am not in class, and I am (almost) always happy to see you (it is a good idea to make an appointment if you are able to plan ahead).

Schedule: We will meet in NH 16 at 9:00 Mon., Wed. and Fri. and at 8:30 Tues.

Final Exam: Tuesday May 8, 2018 7:45-9:45 AM

Text: you should have the textbook Discrete Mathematics by John A. Dossey and Albert D. Otto (5 ed.)

Announcements, schedules, assignments and review sheets are posted on my web site: http://langfordmath.com/. I will be posting your scores on D2L. Sometimes there are problems (both human and machine errors). Please save your graded work until after you have checked your grades in D2L to make sure I have scores recorded correctly.

Calculator: Most students prefer to have a calculator. You will be allowed to use a calculator, but not a cell phone calculator during quizzes and tests. It will be advantageous to have either a scientific or a graphing calculator (though we will not be using the graphing capabilities during this course)

Grading: Your grade will be based primarily on the weighted average of your assessments. I will occasionally raise a grade for someone who shows a greater understanding of the content (eg. in class discussions) than is reflected in the test scores, but I never lower a grade below what is indicated by the weighted average).
indicated by the weighted averages below:

A: 94-100%	A-: 90-93%	B+: 87-89%	B: 84-86%	B-: 80-83%
C+: 77-79%	C: 74-76%	C-: 70-73%	D: 60-69%	

Weighted averages: tests: 85%, homework: 10%, attendance and class participation 5%

Tests: 85%. There will be 3 hour-long tests (scaled to 100 pts), and a comprehensive final exam (scaled to 200 pts). There may also be a small number of mini-tests (variable points).

Homework: 10%. Homework scores will come from one of two sources:

- Homework completed outside of class and submitted
- Homework quizzes: in class quizzes on not-collected practice problems. You may use hand-written notes during homework quizzes.

homework scores will be adjusted in the gradebook to be equally weighted. The highest 10 homework scores will make up the homework section (10%) of your final grade. No late homework will be accepted.

Attendance and class participation: 5%. I will take attendance regularly, and update the participation grade in the grade book about every 2 weeks. I plan to use the following function to calculate the participation grade. ((days attended)/(class days)*10)-6)+min((positive classroom interactions)*8/(class days),1). This is somewhat experimental on my part, and I may adjust the formula slightly as needed.

Approximate schedule:
Weeks 1-3.5: Sets, functions, logic and proof, modular numbers (Test 1)
Weeks 3.5-7: Induction, combinatorics, probability (Test 2)
Weeks 8-10: Algorithms and recursions (Test 3)
Weeks 11-14: Graph theory (Final exam)

Individual concerns: If you are concerned about any aspect of the course requirements (test taking, homework, participation), please make an appointment to talk to me about your concerns.

Additional information

Teacher Content Standards: The College of Arts and Sciences has a webpage that links you to the teacher content standards by course number. " DPI CONTENT STANDARDS: The State of Wisconsin has established content standards that education programs are required to have in their courses. These standards are the basis of the Praxis II Content exams that all licensure candidates are required to pass prior to receiving a license to teach in Wisconsin." Linked by course number from this page: https://www.uwrf.edu/MATH/WisconsinContentTeacherStandardsMathematicsCourses.cfm.

The UWRF promotes safe, inclusive and effective learning environments that protect the rights and support the interests of both students and faculty. For additional information regarding our inclusivity expectations, academic accommodations, academic conduct expectations and processes, and other syllabi information, please consult http://go.uwrf.edu/Syllabi

Course Objectives

At the end of this course students will be able to:

1. Solve problems involving the definition and basic properties of sets and set operations.
2. Use modular arithmetic to solve an applied problem.
3. Use a basic proof technique to construct a valid proof.
4. Use mathematical induction to prove a claim.
5. Apply counting techniques to solve a problem.
6. Use counting techniques to compute a probability.
7. Solve a recurrence relation.
8. Solve problems involving the definition and basic properties and types of a graphs.
9. Determine properties of a given graph, such as the chromatic number or the existence of an Euler Circuit.
10. Show how graphs are used to model applied problems.
11. Apply the basic ideas of problem solving.

Required Course Content

I Preliminaries a) set theory b) integer properties, modular arithmetic, applications of modular arithmetic c) algorithms for computations, including analysis of efficiency as related to computer speeds. d) introductory logic including elementary proof techniques using number theory concepts (e.g. divisibility) e) mathematical induction f) introduce the basic ideas of problem solving (and apply these to all of the subsequent topics). II Combinatorial Reasoning a) basic principles 1. permutations 2. combinations b) binomial coefficients c) combinatorial identities d) introduction to discrete probabilities and its real world uses e) applications to and connections to other fields	III Recurrence Relations a) model solution to problem with a recurrence relation b) methods to solve recurrence relations c) view recurrence relations and difference equations as discrete analogs to differential equations IV Introduction to Graph Theory a) illustrations of graphs used to model 'real-world' phenomenon. 1. chemistry applications 2. scheduling applications 3. other applications b) paths, circuits and chromatic number 1. Euler circuits 2. Hamilton cycles 3. 'Shortest path' algorithms 4. Chromatic number of a graph

Mode of Instruction: Face to Face **Prerequisites:** MATH 156 or 166.