MAT 226: Discrete Mathematics  
Fall 2014  Sec 02  Class #2099  
Tu, Th 9:35-10:50 AMB 147

SYLLABUS AND COURSE INFORMATION

INSTRUCTOR INFORMATION  
Instructor: C. Tyler Diggans  
Office: AMB 135  523-6876  
Email Address: Tyler.Diggans@nau.edu

Office Hours:  
Tues, Wed: 12:30 - 2:00  
Th: 11:00 - 12:00  
Fri: 9:00 - 10:00

COURSE INFORMATION

Prerequisites: A grade of “C” or better in MAT 125 or equivalent.


Calculators: A scientific calculator will be needed for the homework and exams.

Website: [http://oak.ucc.nau.edu/ctd27/F14/226/226.htm](http://oak.ucc.nau.edu/ctd27/F14/226/226.htm)

COURSE DESCRIPTION

MAT 226 covers topics in three categories: (1) recursion and induction, (2) counting theory, and (3) graph theory.

COURSE OBJECTIVES

1. Use techniques of induction and recursion. The student should be able to:
   a) define sequences recursively;
   b) model appropriate phenomena with recursively defined sequences;
   c) solve some recursions to obtain closed-form solutions;
   d) write proofs using all variations on mathematical induction.

2. Analyze a counting problem. This means:
   a) determine which technique or techniques are relevant;
   b) determine how the processes are nested;
   c) apply them in an organized manner to produce a correct result.

3. Use techniques of graph theory effectively. In particular, the student should be able to:
   a) define and identify particular kinds of graphs
   b) express a discrete problem (scheduling, planning, relationships, etc.) in graph-theoretic terms;
   c) use graph techniques to solve problems;
   d) conduct an independent investigation into graph-theoretic questions at an elementary level.

COURSE OUTLINE:

I. Sets, Sequences, and Recursion Relations (Introductory topics)  
II. Counting Theory (Combinatorics) 
III Graph Theory

Assessment of Student Learning Outcomes:  

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Two In-Class Exams</td>
<td>50%</td>
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<tr>
<td>Homework/Quizzes and Projects</td>
<td>25%</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>25%</td>
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</tbody>
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Grading System:  

<table>
<thead>
<tr>
<th>% of points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>80-89</td>
<td>B</td>
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<tr>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
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<tr>
<td>Less than 60</td>
<td>F</td>
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Grading System:

- At least a grade of
Attendance: Although attendance will not be taken daily, there will be a lot of in-class work that will count as quiz grades. All in-class work/quiz points will be lost if absent, except in the case of institutional excuses. You are responsible for everything you miss if you choose to be absent from class. I do not mind answering questions in my office hours; however, I expect you to get any missed notes and formulate specific questions before asking me about missed material.

Classroom Etiquette: I expect students to be on time and focused on the day’s lesson. I expect students to refrain from working on homework during class. I expect students to refrain from all cell phone use including texting. If I see a cell phone out and in use during class time, I will deduct 5 points from your next exam grade.

Students in violation of these policies may be asked to leave class.

WeBWorK: A portion of your homework will be done online through WeBWorK. You can find the login page at https://webwork.math.nau.edu/webwork2/CDiggans_226/

Bookwork: We will have regular homework assigned from the book. All assignments can be found on the course website. In order for you to get credit for your bookwork, you MUST turn in NEAT, STAPLED, ORGANIZED work.

Take pride in your work and turn in a final copy of your work rather than some scratch papers stapled together in random order. I reserve the right to assign a grade of zero for unprofessional work that is turned in on time.

The purpose of the bookwork is to show how you get to the answer. Some problems may not need work, but I will be grading the work in between the question and the answer as much as I am grading the answer. The correct answer with no supporting work may not receive full credit.

You must do all of your own homework. If I see multiple copies of the same work, I will assign an even percentage of the total score to each “copy”.

In Class Activities: We will have in-class group work relatively often. These assignments will count toward your quiz grades and may not be announced prior to the start of class.

Exams: We will have 2 in-class exams. I will give you at least two class periods of notice before any exam. If you are planning on missing any class periods for any reason, come to my office hours to discuss the possible impact on your grade.

Project: You will have one project to do on your own which will be 5% of your overall grade. More information and possible topics will be given throughout the course. I encourage you to think of applications of discrete mathematics that are of interest to you as a possible topic for your project. You need to discuss any chosen topic with me before you begin.

Make-Up Exams: Make-up exams are rare. It may be possible to take an exam early at a time convenient for me, if you let me know at least a week in advance.

If you are ill, you must bring me a doctor’s note, before discussing a make-up exam. Do not come to me after an exam asking to make it up, unless you have documentation. If you are sick enough to miss an exam, then you are sick enough to go to the doctor. An unexcused absence at a test will result in a zero.

Any make up exams will be created to be more difficult in order to discourage unnecessary make up situations.

Final Exam: Tuesday, December 9th, 2014 at 7:30am-9:30am in our usual classroom. NO EXCEPTIONS. The final exam day and time are not negotiable. Do NOT arrange to leave town before the scheduled final exam. The final exam is worth 25% of your final grade. Poor performance on this comprehensive exam may cause your grade to drop significantly.

Drop Deadline: The last day to drop the course so that it will not appear on transcripts is Thursday, September 4th.

Withdraw Deadline: If you plan to drop this course, you must do so before Friday, October 24th. It is almost impossible to drop the course after this date, so consider your options in advance of the deadline. A failing grade or the consequences of a failing grade are not acceptable reasons to drop the course after this deadline.
Course Pre-requisites and Placement: Prior to enrollment in a course in the Department of Mathematics and Statistics a student must have completed the course pre-requisites or have proper placement for the course. It is the student’s responsibility to check that they are properly enrolled in a course and to drop the course if they are not. Failure to do so could result in not receiving credit for the course. The department may cancel student’s registration in a course in which they are not properly enrolled. However, it is the student’s responsibility to monitor their own enrollment.

Administrative Drops: An instructor may administratively drop from a course any student who is absent one or more times from class during the first week without contacting the instructor and receiving approval. Students who have not met all prerequisites for a course may be administratively dropped. However, it is the student’s responsibility to monitor their own enrollment.

Class Attendance: Students are expected to assume full responsibility for class attendance and are accountable for work missed because of absences. Instructors are under no obligation to make special arrangements for students who have been absent unless such absence has been excused by a formal institutional excuse. Institutional excuses permit a student to be absent from classes to represent the University in athletics and extracurricular or academic activities. Institutional excuses must be hand-delivered to the instructor and arrangements made for the work missed prior to the planned absence from class.

Dropping/Auditing a Course: The last day you may drop/delete a course (without the class appearing on your transcripts) is September 4, 2014. The last day you may drop a course (and receive a W) is October 24, 2014. Academic policy requires that a student who never attended class or stopped attending class receive an F should the student fail to officially drop the course. The deadline to change from credit to audit or vice versa is September 4, 2014. Once a student has registered and completed a class as an auditor, the audit grade cannot be changed to a credit-earning grade. The grade of AU is awarded to a auditors for satisfactory attendance. See the most recent Academic Catalog for more information at: http://catalog.nau.edu/. The College policies on exceptions can be found at http://nau.edu/CEFNS/Student-Resources/Advising/ at the bottom of the page.

The Grade of Incomplete: A grade of I is given by an instructor only if a student is unable to finish a course due to extraordinary, unforeseeable circumstances, and the deadline to drop has passed. An incomplete is only given to a student who was passing the course with a grade of C or higher at the time the student was forced to stop attending. Before a grade of I can be given the student and instructor must complete the official department form indicating the work to be completed, as well as the date(s) by which the work must be completed. A grade of I not removed within a one-year period automatically reverts to a grade of F.

Final Examinations: Final examinations are required in all classes and must be given at the scheduled times and dates indicated in the university final exam schedule. An exception to the official final examination schedule can be made if a student is scheduled to take more than two examinations in one day. For more information, see the schedule at: http://nau.edu/Registrar/Important-Dates/Fall/.

NAU Policy Statements: Students are responsible for the following policies: Safe Environment, Students with Disabilities, Institutional Review Board, Academic Integrity, and Academic Contact Hour. A copy of these policies may be downloaded from the website http://nau.edu/OCLDAA/Forms/UCC/SyllabusPolicyStmts2-2014/.

Department Policy on Use of Portable Electronic Devices: Cell phones, mp3 players and portable electronic communication devices, including but not limited to smart phones, cameras and recording devices, must be turned off and inaccessible during in-class tests. Any violation of this policy will be treated as academic dishonesty.

Rev 8/5/14