

FLORIDA STATE UNIVERSITY

MAD 3105

Discrete Mathematics II
Online Sections (Canvas)

Spring 2018

<https://my.fsu.edu>

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INTRODUCTION

MAD 3105 – Discrete Mathematics II **Dr. Parmjeet Cobb**

Welcome

Welcome to Florida State University's MAD 3105: Discrete Mathematics II, an online course. It is assumed that you have passed and understand the concepts covered in MAD 2104: Discrete Mathematics I.

This course is a continuation of Discrete Math I. There will be some overlap of the material. This course will introduce you to a variety of topics in discrete mathematics and their applications to computer science, develop your ability to understand mathematical reasoning and to prove material on your own, and develop your ability to communicate mathematics correctly and effectively. We will look at understanding mathematical reasoning and communication through the study of relations, graphs, and Boolean algebra.

Comments about Discrete Mathematics

Discrete Mathematics is usually the first math class students take that requires one to understand how to read and write mathematics. In particular, it is often the first class students are required to write proofs.

This course should be thought of as a "math composition" course. Since MAD 2104 and MAD 3105 are probably unlike previous math courses you have taken, it will require extra attention to definitions, technique, and practice with homework problems. As we all know, mathematics cannot be learned by reading it, it must be continually practiced on your own. Study well!

Syllabus for MAD 3105 – Spring 2018

Course Number, Title, and Prerequisites

Course Number: **MAD 3105**
Course Title: **Discrete Mathematics II**
Credit Hours: 3 semester hours
Prerequisites: You must have passed MAD 2104, Discrete Mathematics I, or MGF 3301, Introduction to Advanced Mathematics, with a C- or better and must never have completed with a grade of C- or better a course for which MAD 3105 is a (stated or implied) prerequisite. Recommended prerequisite: MAC2311.
It is the student's responsibility to check and prove eligibility.

Instructor for online sections

Parmy Cobb
Office: Holley Building A211-X, Panama City Campus
Office Hours: Regularly via Blackboard course Discussion Board
By appointment via phone or online. Also, see:
<http://pc.fsu.edu/Faculty-Staff/Resident-Faculty-Directory/Parmjeet-Cobb>
Phone: (850) 770-2128
E-mail: **pcobb@fsu.edu**

Course Mentors/graders

Ms. Martha Compton
Graders grade all weekly assignments. See the Canvas course website for contact information (see "Start Here" link, then "Instructor & Graders' Contact Info")

Course Description

The purpose of this course is to develop knowledge and skills in fundamental mathematical topics that are relevant to computing, particularly to the systematic development of software.
This course is intended for computer science majors and other science majors with an interest in mathematics. It is a requirement of the BS computer science major. This course covers techniques of definition and logical argument, graphs and digraphs, relations, Boolean algebra, and applications. In the text, Discrete Mathematics and Its Applications 7th ed., we will cover selected material from Chapters 8, 9, 10, and 11.

Course Objectives

At the end of the course, the student will be able to:

- Demonstrate the knowledge of fundamental concepts and techniques in graph theory and Boolean algebra
- Prove or disprove mathematical statements using mathematical induction and other proof techniques
- Understand and be able to use the language of set theory
- Demonstrate the understanding of abstract concepts in written form through proofs

Required Course Materials

Textbooks
Kenneth H. Rosen (2012) Discrete Mathematics and Its Applications (7th Ed.). McGraw-Hill Higher Education [ISBN-13: 9780073383095].
This textbook was also used in MAD 2104 Discrete Math I.

There is also an FSU Custom Edition (loose-leaf) available [ISBN-13: 9781398096056]. Some students find the loose pages difficult to deal with.

You may find an electronic versions online as well.

Recommended Supplementary Text: Kenneth H. Rosen and Kenneth W. Grossman (2012) Student Solution Guide for Discrete Mathematics and Its Applications (7th Ed.). McGraw-Hill Higher Education, [ISBN-13: 9780077353506]

Online Course Notes

The online Course Notes for this course may be downloaded from <http://www.math.fsu.edu/~pkirby/mad2104/>

Course Website

On Canvas: <https://my.fsu.edu>

Students will be able to access the Canvas course site by the first day of class. Videos are posted under the “**TEGRITY CLASSES**” link on Canvas. Make sure to select “**VIEW BY TITLE**” in order to see the videos in the correct order.

Course Requirements And Grading

Your grade will be based on quizzes, written assignments (to be completed individually-no group work), two proctored exams and a proctored cumulative final exam. The exam dates are given on the course calendar on the Canvas course web site, as well as the ODL (Office of Distance Learning) website:

<https://distance.fsu.edu>. Information about proctored testing can also be found on the Canvas course web site. You are responsible for meeting the requirements of your designated testing center regarding scheduling and fee payment (if any).

Note: The final exam *can* replace a low or missing exam grade. *Students who are registered with the Student Disability Resource Center should take a copy of their accommodation letter with them to their proctoring site* (if for some reason you fail to show up in the system with needing accommodations).

Grades in this course will be based on assessment of individual assignments and exams according to the following weighted average:

- 30% Graded Assignments
- 20% Exam 1
- 20% Exam 2
- 30% Final Exam

A 90-100

B 80-89

C 70-79

D 60-69

F 0-59

Plus/minus grade will be the upper/lower in each grade range.

At the end of the course a grade of I will not be given to give additional study time or to avoid a grade of F. Failure to process a course drop in a timely manner may result in a course grade of F.

Course Policies on (Weekly) Graded Assignments

Written graded assignments constitute 30% of your course grade. They are assigned and due weekly [as detailed in the course schedule on the Canvas course web site]. Assignments should be submitted in **pdf format** through the Canvas course web site. Additional details are available in the section Submitting Files to Canvas. The lowest assignment grade will be dropped.

The Canvas server will date/time stamp (using Tallahassee time - Eastern time zone) the assignment when turned in. Assignments should not be sent by e-mail. You are advised to submit early whenever possible to avoid the inevitable disasters such as file not saved properly, submission of wrong file, conflicting work schedule

demands, oversight of due date, computer malfunction, Internet connection disrupted, etc. These things really happen. You need to have a backup plan. **NO LATE ASSIGNMENTS ACCEPTED.** However, please contact the instructor ASAP if you have an emergency such as a death in the family, hospitalization, ice storm, etc. Those situations will be dealt with on an individual basis. The LOWEST assignment grade will be dropped. Assignments may be handwritten or typed but must be neat and well organized. Assignments that are illegible and/or disorganized will be given a grade of 0. Assignments are NOT a group effort. They must be **completed individually**.

You will be graded on clarity and use of mathematical notation and English explanation (if required). Your notation and graphs must conform to the standard notation and symbolism used in our course. There are some standard alternatives for the notation used in the course notes such as the pseudo- $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ commands listed at the end of this document. These can be used to type the mathematical content without using special symbols. You are NOT required to learn or use $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, but you may choose to substitute an appropriate $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ command in place of a symbol and your instructor or mentor/grader will read it as the correct symbol. Do not simply create your own notation for symbols!

NO EXTRA CREDIT

Policy on Outside Sources and Collaboration: You must complete your own work. You may consult with fellow classmates (including via the Canvas course Discussion Board), consult outside sources such as books or web sites, but in the end your work must be your own. You must cite all outside sources and collaborations with other students. Do not “cut and paste” or copy word for word from any source. Failure to submit only your own personal work is a violation of the Academic Honor Policy detailed in a later section.

Course Policies on Exams

You must arrange to take your exams in the presence of an approved proctor. You must submit the Online Proctor Designation Form during the first 2 weeks of classes each semester (if it is a summer course, then within the first week). A link to this with exact deadlines is available under Web Links on the Canvas course web site. It is also available on the “Course Schedule” and the ODL (Office of Distance Learning) web page: <https://distance.fsu.edu>

You will take two exams during the semester, plus a cumulative final exam. Each exam will be **2 HOURS** using pencil & paper. The exams, along with any provided scratch paper, will be scanned back to the instructor for grading. No calculators or other aides allowed on the exams.

EXAM 1 Window: Please see the Course Daily Schedule on Canvas

EXAM 2 Window: Please see the Course Daily Schedule on Canvas

FINAL EXAM Window: Please see the Course Daily Schedule on Canvas

Some proctors or testing centers are available only on selected days; for example, many testing centers do not open on weekends and some not on Fridays.

You are responsible for knowing and abiding by your proctor site’s requirements for scheduling and fee payment (if any). Always bring your FSU Identification with you and any other needed form of identification that your proctoring site may require.

A review with solutions will be posted on the course website before each exam. Most of the review questions will be similar to exercises in the course notes and/or

assignments. Students are responsible for all material and announcements given on the Canvas web site as well as the material in the course notes and assignments.

Excused absences from exams will be given only in cases of an unavoidable, documented, and verifiable emergency event during the exam window. Handling such absences will be at the discretion of the instructor. Examples would be an illness or hospitalization for which a written medical excuse is provided by the attending doctor or severe weather (hurricane, tornado, ice storm) in your immediate vicinity that prevented the proctoring test center from being open or prevented safe travel to the center. In such situations, contact the instructor as soon as you can.

Course Policies on Discussion Board

The Discussion Board should be one of the first places to check seek answers to questions and to ask questions about material you find difficult. It is also an area of the course web site that you and your classmates can use to collaborate asynchronously. However the Discussion Board should not be used to collaborate on graded assignments.

Follow the rules below when using the Discussion Board:

1. You may ask any question about any part of the reading material, practice problems, and previously graded problems on the Discussion Board.
2. You may ask questions about the examples in the online Course Notes or post solutions to the exercises in the online Course Notes.
3. Proposed solutions to any problems that are not assigned for a grade may be posted at any time.
4. Solutions to graded problems must not be posted until after the assignment is due.
5. You are encouraged to attempt to answer related questions and confirm your conceptual understanding of the course material.

Your postings on the discussion board will not be graded. The course instructor will regularly monitor the Discussion Board and post answers, clarifications, and (if needed) corrections. Please address any specific questions to “Professor,...” if you want an answer back quickly from the instructor. Otherwise, the instructor will wait a couple of days to see if other class members would like to reply.

Americans with Disabilities Act

Students with disabilities needing academic accommodation should:

(1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the: Student Disability Resource Center 874 Traditions Way 108 Student Services Building Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD)

sdrc@admin.fsu.edu <http://www.disabilitycenter.fsu.edu>

ALWAYS BRING A COPY OF YOUR ACCOMMODATION LETTER TO YOUR PROCTORING SITE BEFORE EACH EXAMINATION IN CASE THE PROCTORING CENTER DID NOT UPDATE THE TESTING INFORMATION/TIME.

Honor Code

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (FSU Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>.)

Attendance Policy

University Attendance Policy:

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Other

Free Tutoring from FSU: On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options at <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Netiquette Statement: *Considering online classes will take place in a variety of settings, it is important to have a reference point for successful participation in this online environment. Be mindful of the Core Rules of Netiquette taken from Virginia Shea's Book and Website - <http://www.albion.com/netiquette/corerules.html>*

Rule 1: Remember the Human.

Rule 2: Adhere to the same standards of behavior online that you follow in real life.

Rule 3: Know where you are in cyberspace.

Rule 4: Respect other people's time and bandwidth.

Rule 5: Make yourself look good online.

Rule 6: Share expert knowledge.

Rule 7: Help keep flame wars under control.

Rule 8: Respect other people's privacy.

Rule 9: Don't abuse your power.

Rule 10: Be forgiving of other people's mistakes.

Canvas Issues: Please contact Canvas support from the Canvas homepage.

Important Topics from Discrete Mathematics 1

Topics included in MAD 2104 Discrete Mathematics I are not consistent from one school to the next. If you did not take MAD 2104 Discrete Mathematics I at Florida State University you may have covered a different collection of topics, even if you used the same textbook. Also, some instructors cover the same topics, but emphasize application of the concepts rather than mathematical reasoning and proofs. You must understand those concepts.

The major topics covered in MAD 2104 at Florida State University are summarized below. Text sections are identified for each topic to assist in your review. In MAD 3105, you will be expected to utilize the proof techniques covered in the textbook sections listed below. Also, Dr. Kirby (lead faculty for on-campus sections of MAD 2104-3105) has made online notes for MAD 2104 available for your review at the following URL:

<http://www.math.fsu.edu/~pkirby/mad2104/>

A link to these notes is also included on the MAD 3105 schedule. Feel free to discuss any content with your instructor.

Introduction to Sets & Set Operations	Rosen7 Sections 2.1 – 2.2, 2.5
Introduction to Functions & Properties of Functions	Rosen7 Section 2.3
Logic	Rosen7 Section 1.1-1.2
Propositional Equivalences	Rosen7 Section 1.3
Predicates and Quantifiers	Rosen7 Section 1.4-1.5
Logical Arguments and Formal Proofs	Rosen7 Section 1.6
Methods of Proofs	Rosen7 Sections 1.7-1.8, 6.2
Induction	Rosen7 Sections 5.1-5.2
Recurrence	Rosen7 Section 5.3
Growth of Functions	Rosen7 Section 3.2
Integers and Division	Rosen7 Sections 4.1, 4.3
Integers and Algorithms	Rosen7 Sections 4.1, 4.3
Applications of Number Theory	Rosen7 Sections 4.2, 4.4
Matrices	Rosen7 Section 2.6
Introduction to Graphs & Graph Terminology	Rosen7 Sections 10.1 – 10.2
Representing Graphs & Graph Isomorphism	Rosen7 Section 10.3
Introduction to Relations	Rosen7 Section 9.1

Submitting Assignment Files

Submitting an Assignment

All assignment documents to be graded will be submitted for grading through the Canvas course website (www.my.fsu.edu). Canvas automatically places a date and time stamp once the file is uploaded. The time is Eastern Standard time zone (Tallahassee time). All work must be submitted by the end of the day posted, **Eastern Standard time**. It is **your responsibility to verify** that your file was in fact submitted correctly and that the correct and entire file was submitted. You will not be permitted to submit after the submission period has ended, even if the wrong file was submitted. If there is a problem, you will be contacted via email. The file uploaded will be the one that the graders will grade. *All previous submission scores of the same assignment will be “erased,” so that the last attempt will be the one that is left to receive a grade. You have an unlimited amount of attempts to resubmit the assignment before the due date/time.*

File Naming Convention

Use the following file naming convention for assignment documents submitted for grading in this course: **A##xyLASTNAME.pdf** where A## is the assignment number (A01, A02, A03, etc), and xyLASTNAME is your initials followed by your FULL last name in CAPS. For example, if your name were Xavier Young Last, then you would name the file for assignment 1: **A01xyLAST.pdf**

Make sure you only submit **ONE file (in .pdf form)**. Do NOT submit each page/problem separately. Compile your pages to ONE file. **Scan the assignment page to the front of your work, and make sure your name is on each page of your work.** There are many free scanning programs (like CamScanner) that will allow you to use easily compile to one pdf.

Assignment Document Requirements

- Assignments must be in .pdf format. You may use a scanner on campus or at home if submitting written work, use a converter on the computer if submitting typed work, or use an ipad/smartphone app like CamScanner that allows you to easily scan your work by taking pictures of your assignment. Make sure your **IMAGES/SCANS come out LEGIBLE** (not too much light, not too little light, etc).
- Assignments must be downloadable and LEGIBLE. You **MUST** verify this. Otherwise, you will receive a 0 on your Assignment (deemed as ungradable).
- Your notation and graphs must conform to the standard notation and symbolism used in our course. Sometimes there are standard alternatives for notation used in the course notes or in your text. If you are typing your assignments and cannot create the appropriate symbol, please look up the LaTeX command for the symbol or ask your instructor for an alternative notation (perhaps even writing out the symbol in words would be best). Do not simply create your own notation.

Note: You are not required to learn or use LaTeX commands. You simply may choose to substitute a LaTeX command for any symbol you wish to represent and your grader will read it as though the symbol were used.

Submitting Assignment Files Con't

Creating Assignment Documents (.pdf)

You may use Word, LaTeX, or other appropriate processing programs. Once you have created the document file, you will need to convert the document to a .pdf file.

Graphs may be created in Word, Powerpoint, Photoshop, or by hand. A graphic tablet (such as Wacom Tablet) is convenient to as well and save as a .pdf file.

If doing work by hand, please take your time to be neat.

Note that light color font will **not** show up when graders print out the assignments. Only **use dark font color** when typing assignments.

Handwritten assignments may be scanned to create a .pdf file, or a scanner may create a file format that then needs to be converted to .pdf format. Make sure to use white paper and pen with dark ink, or press very firmly with a pencil. Write legibly and neatly. Do NOT use dark lined notebook paper or light colored pens. If you use a pen, please clearly cross out errors rather than erasing. Papers with eraser marks do not scan well. Affordable apps are available for the ipad/smart phone, like CamScanner, that allows you to make ONE .pdf file of your work.

You must verify that your scans are legible; otherwise you may receive a 0 for the assignment.

Guide to Studying Discrete Mathematics 2
MAD 3105
Parmjeet Cobb, Ph. D.

Discrete Mathematics is possibly unlike your previous math classes. You will be required to know and apply definitions, read and present proofs, etc.

Time Requirements: Typically, distance students spend just as much time on the course as face-to-face students. They just have more flexibility when to schedule their study hours. A good rule of thumb for studying time for college courses is to spend about **2-3 hours per week per unit credit**. This 3 unit course would require about **6-9 hours per week** outside of “class time” working on this class. Distance students would be expected to spend the additional 3 hours of class time working on reading through and interpreting the notes/material. Thus, the course should take **9-12 hours per week total of your time**.

Comments on Course Notes: The course notes provided (courtesy of Dr. Kirby and Dr. Bryant) contain the material you will be expected to know. The videos are provided by Dr. Parmjeet Cobb. The Rosen textbook provides supplementary content and exercises for you to practice. Graded assignments will be similar to those practice problems.

How to Study for each Unit

- **Preview** the assigned practice exercises, graded assignment problems. Begin by reading exercises that are assigned for a grade. You may not understand all the questions, but that is OK. This will help you know what information is important from the reading.
- **Read** the course notes and assigned textbook sections. Make note of definitions.
- **View** the course videos make sure to set your view as “by title” in Tegrity.
- **Practice** the Rosen textbook practice exercises. Refer to the Student Solutions Guide for more detail about solutions when needed.
- **Ask questions** about the material from the online course notes, the Rosen textbook reading, or the Rosen textbook practice exercises. The Discussion Board on Canvas will have a forum for you to post questions.
- **Review Discussion Board Forums** on Canvas: Perhaps a question you had was already answered on the Discussion Board.
- **Complete graded assignments.** Work on the written, graded assignments for each unit. Either type or NEATLY write your solutions to each problem. Review your completed exercises after converting to .PDF format to insure the conversion was correctly completed and all problems are in the file. Make sure that you compile to ONE .pdf file.
- **Study** the material. Learn definitions, properties, theorems, and formulas. Flash cards may be helpful.
- **Submit your graded assignment** on Canvas as ONE .pdf, **NO LATE assignments**.

Preparing for Exams

- As needed, review material you need more practice on: definitions, theorems, formulas, and exercises from the course notes, textbook, etc. If you are still having difficulty with the material, ask your instructor for help on that specific topic.
To prepare for exams, complete the review assignment when it is posted. Review problems are generally like those in the course notes and written assignments. Exam problems are very similar to those in the assignments and review.