SUNY Old Westbury, Spring 2024

MA 3030 Discrete Mathematics

Syllabus

(Last revised: January 23, 2024)

This document is subject to change

Instructor: Yogesh More

Email: morey@oldwestbury.edu

Class meeting times and location:

9:50 am - 11:30 am MW New Academic Building 3121

Office Hours:

MW 11:30 am - 1:00 pm NAB 2012

Course description:

From the course catalog: An introduction to discrete mathematical structures. Topics propositional and predicate logic, set theory, relations and functions, induction and recursion, algorithms and number theory, graph theory

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Textbook:

Discrete Mathematics and Its Applications by Kenneth Rosen (Any edition is fine)

An excerpt of an older edition (7th edition) that I will annotate during class is: https://notability.com/n/1h0PgqVQlEqfEbeqDJnhDv

Kimberly Brehms playlist matching up with the textbook: https://youtube.com/playlist?list=PLl-gb0E4Mll28GykmtuBXNUNoej-vY5Rz&si=8ks94rGyBEZ8lo45

In this course we will cover Chapters 1, 2, 4, 5, and then select sections of later chapters.

Supplementary Resources:

- Trefor Bazett's YouTube playlist for Discrete Math: https://youtu.be/rdXw7Ps9vxc?si=_9pyasp9cfdQeCkF
- My notes when I taught this course out of a different textbook by Susanna Epp: **Lecture Notes**: https://github.com/morey-ow/ma3030-fall2023/blob/master/3030-lecture%20notes.pdf **Slides**: https://github.com/morey-ow/ma3030-fall2023/blob/master/3030-slides.pdf

- Prof. David Ralston's YouTube playlist: https://youtube.com/playlist?list=PLYPU-RArkLZOu7j172N2ZDDUxw4XgE5X2&si=NcIlC7kO1vQygbGZ

###Math Learning Center

In the library. https://www.oldwestbury.edu/math-learning-center

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Course Website:

Brightspace/D2L: mylearning.suny.edu

Grading

Grading will be based on:

- in class work (quizzes, 'exit tickets')
- 2 mid term exams
- final exam: Wednesday May 15

Grading scale: (Taken from a syllabus by Prof. James Thomas)

A demonstrates **excellent** understanding and ability to explain the course material

B demonstrates **good** understanding and ability to explain the course material

C demonstrates **moderate** understanding and ability to explain the course material

D demonstrates **little** understanding and ability to explain the course material

F demonstrates **very little to no** understanding and ability to explain the course material

Participation You are responsible for your own learning. I think you will learn best if you attend all classes, otherwise it is easy to fall behind quickly.

Schedule

(tentative, will be completed later)

An excerpt of an older edition (7th edition) that I will annotate during class is here: https://notability.com/n/1h0PgqVQlEqfEbeqDJnhDv

Before each class,

1. either **read the section of the text** listed for that day, OR **watch the videos of the corresponding sections** in this playlist by Kimberly Brehm https://youtube.com/playlist?list=PLI-gb0E4MII28GykmtuBXNUNoej-vY5Rz&si=8ks94rGyBEZ8Io45

2. then try the homework (and check your answers in the back of the text). During class we will go over the homework problems.

3. 'Exit ticket' for each class will be a few problems similar to the homework problems - you do these in class and submit them before you leave.

Week 1

Wednesday January 24 (Logic)

- Introduction to the course
- 1.1 Introduction to Propositional Logic HW: 9d, 17, 27, 31d, 41, 50

Week 2 (Logic)

Monday January 29

- 1.3 Propositional Equivalences HW: 5, 6, 11, 15, 25

Wednesday January 31

- 1.4 Predicates and Quantifiers HW: 1, 5, 13, 35
- 1.5 Nested Quantifiers HW: 1, 5, 27, 39

Week 3 (Logic and Proofs)

Monday February 5

- 1.6 Rules of Inference HW: 3, 15, 19, 23, 27, 29

Wednesday February 7

- 1.7 Introduction to Proofs HW: 1, 3, 5, 7, 9, 11, 13, 17

Week 4 (Logic)

Monday February 12

- 1.8 Proof Methods and Strategy HW: 5, 9, 11, 17, 19, 21, 23

Wednesday February 14

Chapter 1 Review p. 111 3bc, 4, 7, 8, 10, 13

Week 5

Monday February 19

- President's Day, no class

Wednesday February 21

Exam 1

Week 6

Monday February 26

2.1 Sets HW: 1, 7, 9, 11, 19, 21, 33

2.2 Set Operations

- 2.3 Functions
- 2.4 Sequences and Summations

Wednesday February 28

- 2.5 Cardinality of Sets

Week 7 TBD

Monday March 4

Wednesday March 6

Week 8

Monday March 11

Wednesday March 13

Week 9 Spring Break, no classes

Monday March 18

Wednesday March 20

Week 10

Monday March 25

- 5.1 Mathematical Induction

Wednesday March 27

- 5.2 Strong Induction and Well-Ordering

Week 11

Monday April 1

- 5.3 Recursive Definition and Structural Induction

Wednesday April 3

Week 12

Monday April 8

- 6.1 Basics of Counting

Wednesday April 10

- 6.2 Pigeonhole Principle

Week 13

Monday April 15

- 6.3 Permutations and Combinations

Wednesday April 17

- 6.4 Binomial Coefficients and Identities

Week 14

Monday April 22

9.1 Relations

Wednesday April 24

9.5 Equivalence Relations

Week 15

Monday April 29

Wednesday May 1

Week 16

Monday May 6

Wednesday May 8

Week 17

Wednesday May 15

- Final exam

Academic Integrity

Do not copy and submit answers you do not understand and can't explain. I reserve the right to meet with you and ask you to explain your answers, and may give you an F for the assignment or course if you cannot reasonably explain an answer. In other words, don't turn in things just to turn in things.

I am **happy to give you the answer to any question** in the textbook, and the textbook itself has solutions to odd numbered problems. But you are cheating yourself if you just copy them, and you are **missing the point of the course** if you do so. **The point of the course is to learn to THINK, not to parrot information!**

The college's policy on academic integrity also applies to this course https://www.oldwestbury.edu/policies/academicresearch/policy-academic-integrity Here are some excerpts from that policy:

> As members of the Old Westbury community, students are expected to adhere to standards of honesty and ethical behavior. Plagiarism and other types of academic dishonesty are condemned at all academic institutions. These acts detract from the student's intellectual and personal growth by undermining the processes of higher learning and the struggle with one's own expression of ideas and information. Good academic procedure requires giving proper credit when using the words or ideas of others.

> Plagiarizing means "presenting somebody else's words or ideas without acknowledging where those words and ideas come from" (Ann Raimes, Keys for Writers, 7th ed., p.135). Examples include:
>
> - copying material from the Internet or other sources and presenting it as one's own
> - using any author's words without quotation marks; using any quotation without credit
> - changing any author's words slightly and presenting them as one's own
> - turning in any assignment containing material written by someone else (including tutor or friend); buying work and submitting it as one's own

> Know what plagiarism is and how to avoid it; for guidance see Raimes or any other college writing handbook.

Course Policy on Usage of AI Chatbots or Codelike ChatGPT, Bard, Bing, GitHub Copilot, etc.

AI Chatbots can be helpful in learning topics, however, at the moment, by and large they tend to struggle with math because they are parroting words without any reasoning.

AI Chatbots sometimes give inaccurate, incomplete, outdated, or outright false responses in an *extremely confident* tone, so use with caution and DO NOT BLINDLY TRUST THEM!

That being said, I allow their use in a limited and appropriate way - namely as a tool to help you learn. However they can also be used as a tool to avoid learning, to avoid engaging with the material, etc., and you are cheating yourself if you use tools this way.

Here are some appropriate ways to use them:

- if you can't resolve an error message, you can try asking an AI Chatbot to explain it
- You can ask it to test your understanding of course material: e.g. ask it to make up quiz questions on concepts you just learned
- Ask it to explain something

For this course, you must understand and be able to explain (at an appropriate level) any answers you submit, whether your answer is your own or you get it from classmate, internet, textbook, AI chatbots, etc.

Accommodations for students with disabilities

If you have or suspect you may have a physical, psychological, medical or learning disability that may impact your course work, please contact Stacey DeFelice, Director, The Office of Services for Students with Disabilities (OSSD), NAB 2065, Phone: 516-628-5666, Email: defelices@oldwestbury.edu. The office will help you determine if you qualify for accommodations and assist you with the process of accessing them. All support services are free and all contacts with the OSSD are strictly confidential. SUNY Old Westbury is committed to assuring that all students have equal access to all learning activities and to social activities on campus. https://www.oldwestbury.edu/academics/support/OSSD

Title IX, Sexual discrimination, harassment, and violence

SUNY Old Westbury prohibits sexual discrimination, harassment and violence, and will promptly respond to all complaints. The purpose of Title IX is to prevent sex discrimination on campus, address reported assaults and incidents, limit the effects of harassment on the educational environment, and prevent its recurrence. If you or someone you know believes they have been subjected to sexual discrimination, harassment or violence, help is available. To report or for more information please visit https://www.oldwestbury.edu/title-ix, please contact the Title IX coordinator, Deputy Title IX coordinator or University Police at 516-876-3333. Confidential resources and support is also available from the counseling professionals in the Counseling and Psychological Wellness Services department, located in the Student Union Lower Level Room LL100 (off the Rotunda) at 516-876-3053.

Dean of Students and Deputy Title IX Coordinator Student Union Suite 303 Phone: 516-876-3067

The syllabus is subject to change at the instructor's discretion to accommodate the needs of the class.