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Department of Mathematics, College of Sciences

**MATH 4200: Discrete Mathematics**

Section A, CRN: 11494

Fall 2023

Course Delivery Method: In-person

Location and Meeting Time(s): 204 GH, 11:00-12:15 M/W

## **Faculty Information**

**Faculty**: Yi Wang

**Office Phone**: 334-244-3318

**Email Address:** ywang2@aum.edu

**Office Location**: GH 213

**Office Hours**: 4:00-5:00 Monday-Thursday

**Important Dates:**

[09/04] Labor Day (or MLK) holiday & student holiday!

[day] [month] [date], [time span] Midterm Exam

[11/13/2023] Last day to drop classes with a ‘W’

[11/18-26] Thanksgiving holiday (or Spring break)!

[11/13-27, 2023] Curtiss on-line Course evaluations

[11/29/2023] Last day of M/W classes

[11/28/2023] Last day of T/R

[Wed] [12] [06], [10:45am-1:15pm] Final Exam

## **Course Information**

**Course Description:** Discrete Mathematics is the language of computing. This course introduces the fundamental concepts and methods of discrete mathematics to apply in many fields including computer science, data science, machine learning, and software engineering. Topics include basic mathematical concepts, combinatorics and probability, graph theory, number theory and cryptography. A hands-on project solving the well-known travelling salesman problem will be introduced.

**Credit Hours:** 3 credit hours

**Prerequisite(s):**

1) MATH 3000.

**2) AND MATH 2660 or MATH 3660.**

**Learning Outcomes:** Upon successful completion of this course the student will demonstrate an understanding of and ability to apply each of the following topics:

* basic mathematical concepts including probability, induction, proof theory, logic, and random variables.
* combinatorics
* graph theory
* number theory
* cryptography

**Recommended Textbook:**

*Discrete Mathematics for Computer Science*, by M. Broadsky, A. Golovnev, A. Kulikov, V. Podolskii, A. Shen. Published by Leanpub, 2023. <http://discrete-math.tilda.ws/(only> e-book).

*Discrete Mathematics,* Richard Johnsonbaugh, published by Pearson. 2018. 8th Ed.

*Discrete Mathematics for Computer Science*, by Gary Haggard, John Schliph, Sue Whitesides, Published by Cengage Learning; 2005.

*Practical Discrete Mathematics*, by Ryan T. White and Archana Tikayat Ray. Published by Packt Publishing, 2021.

**Blackboard Use:** This course uses Blackboard (Bb) for course announcements, instructional materials, interactions, assignments, assessments, posting of grades and feedback, and resources.

For Bb training videos and tutorials, visit <https://help.blackboard.com/Learn/Student>. For information on how this technology protects your privacy, please visit [Blackboard’s Privacy Statement](https://help.blackboard.com/Privacy_Statement). For information on the accessibility of this technology, please visit the [Accessibility in Blackboard Learn Ultra](https://help.blackboard.com/Learn/Administrator/SaaS/User_Interface_Options/Ultra_Experience/Accessibility) page.

**Disability Accommodations (For face-to-face classes)** Students who need accommodations are asked to arrange a meeting during office hours to discuss your accommodations. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not registered for accommodation services through the [Center for Disability Services](https://www.aum.edu/center-for-disability-services/) (CDS), but need accommodations, make an appointment with CDS, 147 Taylor Center, or call 334-244-3631, or e-mail CDS at [cds@aum.edu](mailto:cds@aum.edu).

## **Student Support**

**Free Academic Support:** All students have the opportunity to receive free academic support at AUM. Visit the Learning Center (LC) in the WASC on second floor of the AUM Library Tower or the Instructional Support Lab (ISL) in 203 Goodwyn Hall. The [LC/ISL](https://www.aum.edu/academics/academic-support/warhawk-academic-success-center/learning-center-isl/) offers writing consulting as well as tutoring in almost every class through graduate school. The LC may be reached at 244-3470 (call or walk-in for a session), and the ISL may be reached at 244-3265. ISL tutoring is first-come-first served.

**Technology Support:** For technology assistance, visit the ITS Help Desk located in the computer lab on the first floor of the Taylor Center, call 334-244-3500, email [helpdesk@aum.edu](mailto:helpdesk@aum.edu), or visit the [**Online Help Desk**](https://my.aum.edu/web/wiki/home).

## **Policies and Procedures**

For all university policies, please visit *Current University Policies* at <https://www.aum.edu/governance/university-policy/current-university-policies/>.

**Netiquette Policy:**

Short for internet etiquette, netiquette refers to professional behavior in all online communications, including email, discussions, papers, group work, etc., as described below:

* Avoid using abbreviations (such as IDK, BRB, TTYL or LOL) because not everyone is familiar with them and may find them confusing.
* If you use an acronym, explain it the first time you use it.
* Avoid using the red font, all caps, or multiple exclamation marks, as they are equivalent to yelling.
* Use joking and sarcasm very carefully; they may be misunderstood in the online classroom because of the lack of the facial cues and tone of voice from which we benefit in face-to-face communication.
* Check spelling, grammar, and punctuation carefully & think twice about what you are going to add to an online classroom, as you may not be able to modify or retract it.
* In discussion forums, avoid making simplistic peer responses such as “ditto” or “I agree”. All your posts need to be substantive and supported with evidence from the course or library, in an effort to deepen or move the conversation forward.
* Be forgiving of other people’s mistakes and respectful of the feelings of others.
* When appropriate, use private email instead of posting to the group.
* Use descriptive subject lines to give everyone in the class a clue as to what your post or email is about.

**Attendance Policy: (**For face-to-face class.) Class attendance is mandatory and will be taken in both lecture and lab meetings. Students are expected to arrive at each meeting on time and will be considered absent if they come in after attendance has been taken or leave early. A grade of FA (Failure due to absence) may be issued for students with **more than 5 absences in either the class meetings or lab meetings (more than 3 absences during Summer semesters).** For example, missing 6 lecture meetings, regardless of overall test average and grade in the course, may yield a grade of FA for the course.

A grade of FA will be issued for students who **fail to take the final exam**.

**Classroom Behavior**: Patterns of disruptive behavior that obstruct or disrupt the teaching/learning process will not be tolerated. I would appreciate if mobile phones or pagers are turned off or switched to vibration mode during class meeting. **During tests and the final exam, all cell phones must be ringed off/turned off.**

Please be courteous to your fellow students and the instructor at all times. For example, do not converse with other students, read the newspaper, or sleep during the lecture.

Children should not be brought to class, except in emergency circumstances and only with the permission of the instructor.

Food, drinks, or gum should not be brought into the classroom.

AUM prohibits smoking in campus buildings. If you smoke, you may only do so outside the buildings.

**Academic Honesty Policy:**

The policies of the Student Discipline Code apply. You are advised to familiarize yourself with these policies, which can be found in the current edition of the AUM Catalog. Please, adhere to the standards of academic integrity stated in the AUM Catalog.

Plagiarism or cheating of any kind will not be tolerated. You cannot copy (totally or partially) someone else’s solution or allow someone else to copy your solution.  You may not let somebody else do the quizzes or exams for you. You will receive an “F” in the course if you are caught.

**Electronic Devices**: Cell phones, computers, tablets, and other electronic devices (except approved calculators) should be powered off, set to emit no audible sound, and put away during class. \*\*\*Use of cell phones for any purpose during class is in violation of class policy\*\*\* If you have to answer a cell phone call during class, please quietly leave the classroom and move to a location where your conversation does not disrupt any class in progress.

**Late, Missed, & Make-up Work Policy:**

* 1. There is no make-up for the homework/quizzes/worksheets. Late work passing the given deadline is not accepted.  No make-up test/exam is allowed for a missing test/exam. A missing test/exam receives a grade of zero. No exam will be given earlier than the scheduled time.  Each quiz will be available for about a week for most cases.
  2. Requests for a makeup for an assignment or a test is ONLY allowed for the reasons outlined in the AUM Attendance Policy and must be justified with an official written excuse:

1. official university events **with excuses provided in advance** by the head of the University unit involved (e.g. for intercollegiate athletic matches, required academic events/academic travel)
2. student illness/medical emergency or medical emergency for member of student’s immediate family
3. death of a member of student’s immediate family
4. military orders (**notification should occur prior to the absence**)
5. jury duty or court subpoena (**notification should occur prior to the absence**)
6. religious holiday (**notification should occur prior to the absence**)
7. weather emergencies or perilous driving conditions (**with notification if feasible**)

**Extra Credit Policy:** Ido NOT give any extra credits whatsoever. Every student in the class are evaluated equally by the above grading policy. Emails requesting extra credits will not be answered!

**Grades and Feedback:** Expect grades and feedback within a week after you submit your assignment, quiz or test.

**Communication Policy:** Please deliver your questions using the regular aum.edu email. Students' questions via email system will be answered within one working day.

**Appeals:** After final course grades have been submitted, you may appeal your final grade. As a first step, you would make a written appeal to the instructor of the course together with a copy of your photo ID.

**Syllabus Contingency Plan statement**:  If normal class and/or lab activities are disrupted due to emergency, or crisis situation (such as a COVID-19 outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to the syllabus and/or course assignments will replace the original materials.

**Grades**

### **Grading Scale: If your overall course average**

|  |  |
| --- | --- |
| >= 90% and Final >=90% | A |
| >= 86% and Final >= 86% | B+ |
| >= 80% and Final >=80% | B |
| >= 76% | C+ |
| >= 70% | C |
| >= 66% | D+ |
| >=60% | D |
| < 60% | F |

**Grade Weight Distribution:**

|  |  |
| --- | --- |
| **Learning Activities** | **Weights** |
| Quizzes / Homework | 45 % |
| Midterm Exam and Projects | 30 % |
| Final Exam | 25 % |
| Total | 100% |

**Amended Grade Weight Distribution: (Oct. 10, 2023)**

|  |  |
| --- | --- |
| **Learning Activities** | **Weights** |
| Quizzes ~~/ Homework~~ | ~~45~~ 50 % |
| ~~Midterm Exam and Projects~~ Homework | ~~30~~ 25 % |
| Final Exam | 25 % |
| Total | 100% |

Exams must be completed independently by the students themselves. Violation of the policy will result in a `F'.

**Midterm Grade:** Your midterm grade will consist of the weighted average of quizzes, projects and exams graded to date using the previously designated weights. *This grade is only meant to be an estimate of current progress in the class and can be quite different than your final course grade.*

## **Learning Activity Descriptions**

#### **Discussions**

There is a Discussion Forum for each week in BB. You are encouraged to post questions and interact with your peers. Remaining active in discussion is a proven way to succeed.

## **Schedule**

* Each assignment due date is indicated either in syllabus or announced in class and/or in Blackboard.

**Tentative Schedule and Assignments (subject to change)**

| Topic | Number of Weeks |
| --- | --- |
| Mathematical Thinking for Computing; Quiz 1 | 3 |
| Combinatorics; Quiz 2 | 1 |
| Probability; Quiz 3 | 1 |
| Introduction to Graph Theory; Quiz 4 | 2.5 |
| Midterm Exam | 0.5 |
| Number Theory; Quiz 5 | 2 |
| Cryptography; Quiz 6 | 2 |
| Routing and Delivery Problem; Project 1 | 2 |
| Final Exam |  |

*Course schedules and Assignments are subject to change at the faculty member’s discretion. If any changes take place, you will be informed through an announcement.*