



## Math 2305.7RE, Discrete Mathematics

CLASS SYLLABUS: Fall, 2022

### INSTRUCTOR INFORMATION

Instructor: Dr. Tingxiu Wang, Professor of Mathematics  
Office Location: Binnion 306 Office Hours: MWF 10:00am-11:00am in Binnion 306  
Or by appointment  
Office Phone: 903-886-5958 Office Fax: 903-886-5945  
Email Address: [Tingxiu.wang@tamuc.edu](mailto:Tingxiu.wang@tamuc.edu) Preferred Form of Communication: **email**  
Communication Response Time: usually within 24 hours during weekdays, M-F.

### COURSE INFORMATION

Course: MATH 2305, Discrete Mathematics, 3 credit hours

Course Materials: DISCRETE MATHEMATICS, 5th Edition, by Kenneth A. Ross and Charles R. B. Wright. Tentatively, chapters 1, 2, 3, and 4 of the text will be covered. If time permits, parts of 5 and 10 will also be covered.

Course Description: A course designed to prepare math, computer science, and engineering majors for a background in abstraction, notation, and critical thinking for the mathematics most directly related to computer science. Topics include: logic, relations, functions, basic set theory, countability and counting arguments, proof techniques, mathematical induction, combinatorics, discrete probability, recursion, sequence and recurrence, elementary number theory, graph theory, and mathematical proof techniques. Prerequisites: Math 2413 with a grade of C or better.

Student Learning Outcomes: A student who passes this course will demonstrate through solving problem the ability to apply mathematical reasoning to physical problems and theoretical situations. The student will have demonstrated problem solving ability that includes but is not limited to proving theorems, working with relations, and identifying relationships between set operations, logic operators, and Boolean algebra. The student will be eligible to enroll in a variety of upper-level mathematics courses (catalog specified).

### COURSE REQUIREMENTS

**Attendance:** Attendance is required. You are responsible for all announcements and materials presented in the class.

**Time for this course:** It is said that education is an investment. In addition to the tuition, a student invests the time for education. The time for study is essential for the success of your education or investment. How much time do you need for this class? A thumb of rules in education is that you need to spend the number of hours equal to at least three times of the credit hours per week in a regular semester, which means that a fulltime student is to take at least 12 credit hours, spending  $12 \times 3 = 36$  hours per week, a fulltime job. This is a three-credit hour class. So, you need to spend at least 9 hours per week. For 9 hours per week, you will spend three hours in the classroom and six hours outside the classroom. After each class, you would need two hours to review lecture notes and do homework. If one has a weaker math background or rusty on the prerequisite, or wants to learn well for a better grade, more time is necessary.

Homework: *Without practice, no one can learn. Without sufficient practice, no one can learn well.* Thus, please do homework. Homework assignments for each week are worth of 10 points. The total for homework is 120 points. Please see homework assignments in Appendix A. **Homework for each week is due by 11:59 PM each Sunday.** Late submission for each week will have an additional deduction of 2 points. The assignment you submit must be your own work. Plagiarism is prohibited. Submit homework to Activities, Assignments on D2L with the following format for your file name: LastName-HW-Week#.

Tests&Final: There will be three tests and a final. Each test is worth 80 points. The final is worth 120 points. Please see Appendix B for the date of each test. The final exam is at 8:00 AM – 10:00 AM, Thursday, Dec. 15.

Extra Credit: The Mathematics Department offers colloquia and math club activities. You will receive 3 points of extra credit for each colloquium and a math club activity you attend up to 15 points. You need to watch flyers posted in the hallways. There is no make-up for extra credit.

Grading: The maximum possible points available in this course are:

Homework	120 points
Tests	240 points
Final	120 points
Total	480 points

Your course grade will be based on the percentage of the points you make to the total points available in the course:

A  $\geq$  90%,      B  $\geq$  80%,      C  $\geq$  70%                      D  $\geq$  60%                      F < 60%.

## TECHNOLOGY REQUIREMENTS

- D2L/LMS: All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the [myLeo](#) Online Learning Management System (LMS). Course materials will be posted on D2. You cannot distribute the course materials without permission of the instructor. To access LMS, go to [myLeo](#), then Apps, then My Leo Online D2L Brightspace. You also have an email account via myLeo - all my emails sent from D2L (and all other university emails) will go to this account, so please be sure to check it regularly.
- TI-NSPIRE or other calculators with similar capability is highly recommended.
- We use D2L to post some course materials and collect homework. You need Scanner/digital camera/cell phone for making PDF files of your work and submit them to D2L. Make one PDF file for homework of each week. Please visit the following video clips for making one PDF file:
  - Using CamScanner: <https://www.youtube.com/watch?v=sZFcQJCmtMI>
  - Android: <https://www.youtube.com/watch?v=FWIVYd2Zc-E>
  - iPhone: <https://www.youtube.com/watch?v=10XH6VfGLqI>

Below are technical requirements

- LMS Requirements: <https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>
- LMS Browser Support: [https://documentation.brightspace.com/EN/brightspace/requirements/all/browser\\_support.htm](https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm)

## ACCESS AND NAVIGATION

You need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

Course materials and grades are posted through LMS. Your homework needs to be turned in through LMS. The course materials are only for this course. You cannot distribute the course materials without permission of the instructor.

**Note:** Computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## COMMUNICATION AND SUPPORT

**Math Lab:** Free tutoring service offered by the Mathematics Department (Binnion Hall Room 328). Please visit the web site for the hours of operation and more details.

<http://www.tamuc.edu/academics/colleges/scienceEngineeringAgriculture/departments/mathematics/students/default.aspx>

**The TAMUC One Stop Shop-** provides as many student resources as possible in one location.

<http://www.tamuc.edu/admissions/oneStopShop/>

**The TAMUC Academic Success Center** provides academic resources to help you achieve academic success.

<http://www.tamuc.edu/CampusLife/CampusServices/AcademicSuccessCenter/default.aspx>

### Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

### Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

## University Specific Procedures

### Student Conduct

- All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).  
<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>
- Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: <https://www.britannica.com/topic/netiquette>

### TAMUC Attendance

- For more information about the attendance policy please visit the [Attendance](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx) webpage and [Procedure 13.99.99.R0.01](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx). <http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

- <http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

### **Students with Disabilities-- ADA Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

#### **Office of Student Disability Resources and Services**

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

### **Counseling Service:**

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit [www.tamuc.edu/counsel](http://www.tamuc.edu/counsel).

### **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

### **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

document and/or consult your event organizer. Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

**COPYRIGHT:** The course materials are only for use in this course. You cannot distribute or share the course materials without permission of the instructor.

### Appendix A: Homework Assignments

Section 1.1, Page 6-7:	2, 3, 4, 7, 11, 20(a)
Section 1.2, Page 14-15:	2, 5, 10, 11, 16, 21
Section 1.3, Page 21-22:	1, 3, 7, 8(a, c, g, h), 13
Section 1.4, Page 27-28:	1, 3, 7, 9(a), 10(a), 11
	Use a Van diagram to show $(A \cap B)^c$ , $(A \oplus B)^c$ and $(A \setminus B) \cap C$ .
Section 1.5, Page 33-34:	2, 3, 5, 6, 10(a), 11(a)
Section 1.6, Page 38-39:	2, 4, 7, 9,
	Also: Let $A_n = \left[ \frac{1}{n}, 1 \right]$ , find $\bigcup_{n=1}^{\infty} A_n$ and $\bigcap_{n=1}^{\infty} A_n$ .
Section 1.7, Page 44-45:	1, 4, 7, 11
	Also: Let $f(x) = x^3 - 4$ .
	(a) Prove $f(x)$ is one-to-one.
	(b) $a = [-1, 4]$ , find $f(A)$ .
	(c) $B = [-3, 5]$ , find $f^{-1}(B)$
	(d) Find $f^{-1}(-4)$ .
Section 2.1, Page 56-57:	1, 2(a, b, c), 6, 12, 17, 18
Section 2.2, Page 65:	1, 2, 4(a-d), 5, 7, 11, 24
Section 2.3, Page 67:	1(b)
Page 70-71:	6, 11, 13, 14
Section 2.4, Page 76:	1, 2, 3, 5, 13 (hint: #5, #13, proof by cases)
Section 3.1, Page 99-100:	1(b, d), 2(a, c, f), 7, 13
Section 3.2, Page 105-106:	1, 2, 10, 11, 12, 16
Section 3.3, Page 111-112:	3, 5, 7, 12, 15, 17
Section 3.4, Page 118-119:	1(a, b, c, d), 2(a, b), 3, 4, 7, 8
Section 3.5, Page 125:	2(c, e, f), 3, 6, 9, 10
Section 4.2, Page 142-143:	4, 5, 7(a, b, d), 8, 11, 14
Section 4.3, Page 151-152:	2, 3, 4, 6, 7, 9, 13
Section 4.4, Page 158-159:	2, 4, 5, 10, 11
Section 4.5, Page 166-167:	1, 2, 7, 10, 11(a, b, c, d, e)
Section 5.1, Page 188:	1, 3(a, b, d), 5, 6, 7, 8, 10, 11
Section 5.2, Page 195-196:	5, 7, 9, 11, 15
Section 5.3—5.4:	TBA

Test 1 covers Chapters 1 and 2. Test 2 covers Chapter 3. Test 3 covers Chapters 4 and the rest. The Final covers all we learn in this semester.

## Appendix B: Suggested Day-by-Day Schedule

This schedule gives you an idea how much you need to learn each day. In case you miss a class, it shows what you should learn by yourself. Please attend to see what is exactly covered in a class. We may modify this Schedule based on actual coverage. **The deadline of each homework assignment is 11:59 PM, Sunday of each week.**

Week of		Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Aug. 29		Syllabus 1.1		1.2	
Week 2	Sept. 5	Labor Day no classes	1.3		1.4	
Week 3	Sept. 12		1.5		1.6, 1.7	
Week 4	Sept. 19		2.1		2.2, 2.3	
Week 5	Sept. 26		2.4		Review	
Week 6	Oct. 3		Test 1		3.1	
Week 7	Oct. 10		3.2		3.3	
Week 8	Oct. 17		3.4		3.5	
Week 9	Oct. 24		Review		Test 2	
Week 10	Oct. 31		4.2		4.3	
Week 11	Nov. 7		4.4/4.5		5.1	
Week 12	Nov. 14		5.2		5.3	
Week 13	Nov. 21		5.4		Thanksgiving	Thanksgiving
Week 14	Nov. 28		Review		Test 3	
Week 15	Dec. 5		Review		Review	
Week 16	Dec. 12		Study for final. No classes		Final 8:00AM-10:00AM	

\* This schedule is for reference. The actual coverage of each day may be different. Please attend each class to learn what is taught. If you miss a class, you need to catch up by yourself.