

**Math 3336 – 17684 (Fall 2020)**  
**Discrete Mathematics Course Syllabus**

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**Course Homepage:** [www.math.uh.edu/~irina](http://www.math.uh.edu/~irina)  
**Lecture Time/Room:** Asynchronous/ see CASA calendar  
**Office:** Online through MS TEAMS  
**Office Hours:** TBA  
or by appointment  
**Prerequisites:** MATH 2331 (formerly 2431) or equivalent.

**Textbook:** Discrete Mathematics and its Applications by Kenneth H. Rosen, **8th edition**, McGraw-Hill Publishing Co.

**The information contained in this class outline is an abbreviated description of the course. Additional important information is contained at your instructor's personal webpage. You are responsible for knowing all of this information.**

**IMPORTANT:** *The instructor reserves the right to make changes on these policies. Any changes will be announced on CASA or in class in a timely manner. Students are expected to be aware of any additional course policies presented by the instructor during the course.*

### **Course Description**

The course provides a careful treatment of logic, proofs, sets, functions, and mathematical reasoning. Using this basis, counting techniques are studied thoroughly. This course concludes with coverage of relations and graphs with a brief introduction to trees.

A student in this class is expected to complete the following assignments:

1. Weekly Homework
2. Poppers
3. 3 Regular Exams
4. Final Exam

### **Grading**

1. Homework 10%
2. Poppers 8%
3. 3 Regular Exams: 57% (19% each)
4. Final Exam: 25%

**Note:** The percentage grade on the final exam (without extra credit) can be used to replace your lowest test score if it is better than your lowest test grade.

**Grading Scale:** If “x” is your average, letter grades will be assigned as follows:

A	$93 \leq x$	B-	$80 \leq x < 83$	D+	$67 \leq x < 70$
A-	$90 \leq x < 93$	C+	$77 \leq x < 80$	D	$63 \leq x < 67$
B+	$87 \leq x < 90$	C	$73 \leq x < 77$	D-	$60 \leq x < 63$
B	$83 \leq x < 87$	C-	$70 \leq x < 73$	F	below 60

### **How does this class work? (Course Structure and Delivery Format)**

#### **Asynchronous Online**

This course is taught **asynchronously**, which means there is no designated day or time assigned to the course (optional synchronous sessions will be provided, such as virtual office hours or discussion groups). Asynchronous instruction generally involves accessing content, such as recorded video lectures, readings, discussion prompts, assignments, and assessments during a flexible time frame, with due dates as specified. This course is **not self-paced**; students are expected to follow assignment due dates as specified on CASA calendar.

**Lecture videos** are posted on CASA calendar; students are expected to watch these videos in a timely manner.

**Live meetings** for this course will take place on the dates and times announced on CASA calendar. During these live meetings the instructor will answer your questions, review important topics, or work on additional topics to be covered. Videos will be posted after live meetings. If you cannot attend the live meeting, make sure you watch the video. Attendance is not mandatory but is recommended.

Live meetings will take place on **MS TEAMS**. All students at UH have access to Office 365 which includes use of Microsoft Teams. For help and instructions accessing Microsoft Teams please consult [this video guide](#). Students enrolled in this class will be automatically added to their instructor’s Team. Make sure you are a member of the Teams: MATH3336-17684-2020-FA

- Students are expected to behave professionally during live meetings. Any students who do not follow the university’s code of conduct might be removed from the meeting.
- Turn off your webcam and microphone before joining the meeting.
- By joining a live meeting, students give consent to be recorded on the live meeting video.

Another key resource that will be used for this course is CASA/ CourseWare.

#### **CASA CourseWare**

Homework, grade book, class notes and prerecorded videos and any additional help materials will be made available at [CASA/CourseWare](http://www.casa.uh.edu) (<http://www.casa.uh.edu>).

*The materials provided by the instructor in this course are for the use of the students enrolled in the course only. Copyrighted course materials may not be further disseminated without instructor permission. This includes sharing content to commercial course material suppliers*

*such as Course Hero or Chegg. Students are also prohibited from sharing materials derived from the instructor's content (e.g., a student's lecture notes).*

### **Technology Requirements**

Computer, web camera, and internet access is required for this course. For the current list of minimum technology requirements and resources, copy/paste/navigate to the URL <http://www.uh.edu/online/tech/requirements>. For additional information, contact the office of Online & Special Programs at [UHOnline@uh.edu](mailto:UHOnline@uh.edu) or 713-743-3327.

In summary, students will need:

- a functioning and updated computer (with microphone, speaker or earphones, and webcam)
- reliable internet connection
- PDF viewer
- Ability to log in to CASA for online assignments.
- Ability to watch mp4 files.
- Ability to access Microsoft TEAMS platform. Note that all UH students have access to MS teams with their cougar net ID.

### **Resources for Online Learning**

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our [Power-On](#) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH; requesting a laptop through the Laptop Loaner Program; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance, contact [UHOnline@uh.edu](mailto:UHOnline@uh.edu).

### **Homework**

Homework will be assigned weekly. A list of homework problems can be found under "Assignments" tab in your CASA account. Homework is generally due at midnight and have to be submitted through a CASA account. The detailed instructions for homework submission are posted on your class web page. Late homework or homework by email is not permitted for any reason. Two (2) lowest homework scores throughout the term will be dropped to allow for missed assignments. The primary reason for this policy is to offset the impact of zero/low homework scores due to emergencies (medical, personal, or otherwise) on a student's final course grade. Hence, students should not expect to have an option to make up missed homework.

You may discuss the problems with other classmates as you figure out how to do the problem or establish its truth, but the write-up should be done by you alone and in your own words. If you have any issues with the way the homework or a particular problem is graded, please contact me.

### **Poppers**

Poppers might be given in two forms; during live meetings or embedded in pre-recorded lecture videos.

- 1) Poppers given during LIVE CLASS MEETINGS:

I might assign poppers during live meetings. Turn in these poppers before the due date under the EMCF tab at CASA. Videos will be posted after live meetings; if you cannot attend the live meeting; make sure you watch the video ASAP and turn in the popper questions.

2) Poppers embedded in LECTURE VIDEOS:

Pre-recorded lecture videos with popper questions embedded in them might be assigned. Turn in the popper under EMCF tab at CASA under the corresponding title (the title will be specified on the video).

Popper due dates and times can be seen under EMCF tab at CASA. Some poppers will be dropped to cover for emergencies or unexpected events.

Sharing answers to popper questions (online, or at group chats, or at any other source) is considered an academic honesty policy violation. Please read the information regarding Academic Honesty below and do not share answers to poppers with your friends. Not only this is cheating; it also prevents other students from watching videos to learn the material and hence this violation is taken very seriously.

### **Exams**

There will be three midterm exams and a final exam.

**Test 1: October 6 @ 4PM**

**Test 2: November 6 @ 4PM**

**Test 3: December 4 @ 4PM**

The **Final exam** is mandatory and comprehensive. It will be held on **December 11, 2020 beginning at 4PM.**

- All tests will be taken online at CASA using the CASA Monitor.
- Students are expected to meet the technology requirements as announced by UH (a working webcam, reliable internet, etc.).
- Access to a webcam is required for students participating remotely in this course. Webcams must be turned on during exams to ensure the academic integrity of exam administration.
- Books and notes will not be allowed on all exams. Please have your Student ID available during each exams.
- Four-function calculators are allowed on each test.

Your raw score on the final will be used to replace the lowest test score if it is better. The primary reason for this policy is to offset the impact of zero scores due to emergencies (medical, personal, or otherwise) on a student's final course grade.

### **Grade Appeals**

Grade appeals on any assignments should be made within five business days of the posting of the assignment grade.

### **Extra Credit**

Extra credit opportunities may be announced during the semester.

### **Late Assignments and Make-up Policy**

This course is a cumulative course. You as a student need to keep up with the reading, poppers, homework assignments and exams. Students are expected to check the calendar on CASA several times a week and plan ahead so that they do not miss assignments. We drop some assignments primarily to offset the impact of zero/low scores due to emergencies on a student's final course grade. Hence, students should not expect to have an option to make up missed assignments unless in the case of an excused absence (See: Excused absence policy below).

Your final exam score will replace your lowest midterm exam score if the former is higher. A missed test will result in a score of zero. If you miss two or more exams, only one of those scores will be replaced. The primary reason for this policy is to offset the impact of zero/low test scores due to emergencies on a student's final course grade.

**If requesting make up work (assignment or test) due to an excused absence: the student needs to contact the instructor in writing before the next class meeting (or as soon as possible afterwards with an explanation regarding why the notice could not be sent before the next class meeting). Read the [Undergraduate Excused Absence Policy](#) to see a list of documentations to support your request; follow the guidelines provided on this document to make your request. Your instructor will inform you of the decision in writing (via email).**

Note: If students lose access to CASA temporarily due to not entering access code by the deadline, or being temporarily dropped from the course for non-payment, then they are responsible for any assignment deadlines that are missed.

### **Excused Absence Policy**

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

**Religious Holy Days:** Students whose religious beliefs prohibit class attendance or the completion of specific assignments on designated dates may obtain an excused absence. To do so, please make a written request for an excused absence and submit it to your instructor as soon as possible, to allow the instructor to make arrangements. For more information, see the Student Handbook. <http://catalog.uh.edu/index.php>

### **Interim Undergraduate Grading Policy**

Due to the unique and unprecedented challenges associated with the COVID-19 pandemic, the University of Houston has implemented an [Interim Undergraduate Grade Policy](#) for undergraduate grades which applies to all undergraduate students in courses offered in all sessions during fall 2020. Under this policy, students have the option of converting final assigned letter grades to S (Satisfactory, applicable to any letter grade from A to D-) or NCR (No Credit Reported COVID-19, applicable to grades of F) on their transcripts. Please visit [FAQs](#) for additional information.

### **Recording of Class**

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Center for Students with DisABILITIES](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

### **Syllabus changes**

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible on CASA or in class.

### **Communication via Email**

Email communications related to this course will be sent to your [Exchange email account](#) which each University of Houston student receives. The Exchange mail server can be accessed via Outlook, which provides a single location for organizing and managing day-to-day information, from email and calendars to contacts and task lists. Exchange email accounts can be accessed by logging into Office 365 with your Cougarnet credentials or through Access UH. They can also be configured on [IOS](#) and [Android](#) mobile devices. Additional assistance can be found at the [Get Help](#) page.

Per UH Policy, notices properly addressed and so sent (for example, via PeopleSoft) shall be presumed to have been received by the student. Thus, you are responsible for the content in emails sent to your UH account, regardless if your external (non-UH) email provider filters or blocks them.

When emailing your instructor, it is recommended that you use a professional email address and include the course name on the subject line so that your instructor can address your questions accordingly. Please read this link for more on communication via email: [EMAIL ETIQUETTE \(https://www.math.uh.edu/~tomforde/Email-Etiquette.html\)](https://www.math.uh.edu/~tomforde/Email-Etiquette.html).

**IMPORTANT:** Note that your instructor will communicate with you via email. Your instructor will not reply to chat messages via MS TEAMS outside of class times. Calls from MS TEAMS will not be responded to unless they are made by appointment. If you leave a voice mail at your instructor's office phone, he/she might not receive it. The best way of communication with your instructor outside of class times is via email.

### **Academic Honesty Policy**

University of Houston students are expected to adhere to the Academic Honesty Policy as described in the UH Undergraduate Catalog. "Academic dishonesty" means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at the University of Houston or by a course instructor to fulfill any and all academic requirements. Academic dishonesty includes, but is not limited to, the following: *Plagiarism; Cheating and Unauthorized Group Work; Fabrication, Falsification, and Misrepresentation; Stealing and Abuse of Academic Materials; Complicity in Academic Dishonesty; Academic Misconduct.* Refer to [UH Academic Honesty website](#) and the UH Student Catalog for the definition of these terms and university's policy on Academic Dishonesty. Anyone caught cheating will be reported to the department for further disciplinary actions, receive sanctions as explained on these documents, and will have an academic dishonesty record at the Provosts office. The sanctions for confirmed violations of this policy shall be commensurate with the nature of the offense and with the record of the student regarding any previous infractions. Sanctions may include, but are not limited to: a lowered grade, failure on the examination or assignment in question, failure in the course, probation, suspension, or expulsion from the University of Houston, or a combination of these. Students may not receive a W for courses in which they have been found in violation of the Academic Honesty Policy. If a W is received prior to a finding of policy violation, the student will become liable for the Academic Honesty penalty, including F grades.

**Posting answers for Poppers or Homework questions online (at group chats or other online tools) is considered an academic honesty violation.** Students are expected to know the difference between "getting/giving HELP on a problem" and "getting/giving answers to a problem". If a student is caught sharing answers (in person or online), he/she might be reported to the departmental hearing officer for an academic honesty violation. If a student becomes aware of cheating or any other violations; that student is responsible for informing the instructor.

### **UH CAPS**

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS ([www.uh.edu/caps](http://www.uh.edu/caps)) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus.

<https://uh.edu/caps/outreach/lets-talk/>



## **CSD Accommodations**

Academic Adjustments/Auxiliary Aids: The University of Houston System complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for students who have a disability. In accordance with Section 504 and ADA guidelines, University of Houston strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please visit The Center for Students with DisABILITIES (CSD) website at <http://www.uh.edu/csd/> for more information.

Accommodation Forms: Students seeking academic adjustments/auxiliary aids must, in a timely manner (usually at the beginning of the semester), provide their instructor with a current Student Accommodation Form (SAF) from the CSD office before an approved accommodation can be implemented.

Details of this policy and the corresponding responsibilities of the student are outlined in The Student Academic Adjustments/Auxiliary Aids Policy (01.D.09) document under [STEP 4: Student Submission (5.4.1 & 5.4.2), Page 6]. For more information please visit the Center for Students with Disabilities FAQs page.

Additionally, if a student is requesting a (CSD approved) testing accommodation, then the student will also complete a Request for Individualized Testing Accommodations (RITA) paper form to arrange for tests to be administered at the CSD office. CSD suggests that the student meet with their instructor during office hours and/or make an appointment to complete the RITA form to ensure confidentiality.

**Students should bring a copy of their approved SAF form when meeting with the instructor to complete a RITA form.**

\*Note: RITA forms must be completed at least 48 hours in advance of the original test date. Please consult your counselor ahead of time to ensure that your tests are scheduled in a timely manner. Please keep in mind that if you run over the agreed upon time limit for your exam, you will be penalized in proportion to the amount of extra time taken. **Please keep in mind that if you run over the allotted time indicated on your RITA form, then your exam score will be reduced 1 percentage point for each minute over.**

## **Helpful Information**

COVID-19 Updates: <https://uh.edu/covid-19/>

Coogs Care: <https://www.uh.edu/dsaes/coogscare/>

Laptop Checkout Requests: <https://www.uh.edu/infotech/about/planning/off-campus/index.php#do-you-need-a-laptop>

Health FAQs: <https://uh.edu/covid-19/faq/health-wellness-prevention-faqs/>

Student Health Center: <https://uh.edu/class/english/lcc/current-students/student-health-center/index.php>



# Math 3336 Discrete Mathematics – Topics List

## ***1. The Foundations: Logic and Proofs***

- 1.1 Propositional logic
- 1.2 Applications of propositional logic
- 1.3 Propositional equivalences
- 1.4 Predicates and quantifiers
- 1.5 Nested quantifiers
- 1.6 Rules of inferences
- 1.7 Introduction to proofs
- 1.8 Proof methods and strategy

## ***2. Basic Structures: Sets, Functions, Sequences, Sums and Matrices***

- 2.1 Sets
- 2.2 Set operations
- 2.3 Functions
- 2.4 Sequences and summations

## ***3. Algorithms***

- 3.1 Algorithms
- 3.2 The growth of functions

## ***4. Number Theory and Cryptography***

- 4.1 Divisibility and modular arithmetic
- 4.2 Integer representation and algorithms
- 4.3 Primes and greatest common divisors
- 4.4 Solving congruencies
- 4.6 Cryptography\*

## ***5. Induction and Recursion***

- 5.1 Mathematical induction
- 5.2 Strong induction and well-ordering
- 5.3 Recursive definitions and structural induction

## ***6. Counting***

- 6.1 The basics of counting
- 6.2 The Pigeonhole principle
- 6.3 Permutations and combinations
- 6.5 Generalized permutations and combinations \*

**7. Discrete Probability**

**8. Advanced Counting Techniques**

8.1 Application of recurrence relations

8.2 Solving linear recurrence relations

**9. Relations\***

**10. Graphs\***

**11. Trees\***

**12. Boolean Algebra\***

(\* optional sections, cover as time allows)