

Discrete Mathematics I (MATH 20123-055) in Spring 2013

Room	Time
TUC 138	TuTh 2–3:20 PM
Instructor	E-mail
Loren Spice	l.spice@tcu.edu
Office	Office hours
TUC 315	Tu 11–11:50 AM (shared) TuTh 1–1:50 PM F 11–11:50 AM and by appointment

Textbook Course notes by Hatcher, available from TCU Printing & Copying at 2865 W Bowie St (by the Grand Marc)

Course goals This class takes a **new** approach to mathematics, replacing memorised rules by formal, logical reasoning that **you** discover, based on precisely stated laws and axioms.

Calculus studies *continuous* structures, like the real-number line and derivatives, which are governed by many rules. We'll work instead with *discrete* structures, like the counting numbers and the principle of induction, which have fewer 'ground rules', but can still exhibit very complicated behaviour. We'll study both general (applicable whenever logical reasoning is appropriate) and specific approaches to managing this complexity.

We will cover most of the text. Particularly important topics for later use in mathematics and computer science are techniques of proof; the algebraic laws governing logical connectives and set operations; modular arithmetic and its application to cryptography; and induction. If time permits, we will continue with a discussion of combinatorics.

Attendance Given the importance of regular participation, attendance is required. You must sign the attendance sheet each class, or you may be marked absent. For each exam, if you have attended all classes since the previous exam, you will receive 1 bonus point. Official Absences are not counted against your attendance. One un-official absence will be excused per exam.

Grading Course components will be weighted as follows:

Homeworks	Class participation	Midterms	Final
15%	10%	15% each (45% total)	30%

You can see your current weighted percentage on the course web-page at any time. If you think that a grade has been mis-computed, you **must** talk to me within 1 week of its being recorded.

Your course grade will be determined as follows:

Min. %	Min. Grade	Min. %	Min. Grade	Min. %	Min. Grade
90%	A-	94%	A		
80%	B-	84%	B	87%	B+
70%	C-	74%	C	77%	C+
60%	D-	64%	D	67%	D+

If you have earned less than 60% of the course credit, then you may receive an F. Exam and course grades may be curved.

Academic Conduct You must comply with the University's academic-conduct policies at http://www.catalog.tcu.edu/current_year/undergraduate/1411.htm, from which the following partial quote is taken.

Any act that violates the spirit of the academic conduct policy is considered academic misconduct. Specific examples include, but are not limited to:

A. **Cheating.** Includes, but is not limited to:

1. Copying from another student's test paper, laboratory report, other report, or computer files and listings.
2. Using in any academic exercise or academic setting, material and/or devices not authorized by the person in charge of the test.
3. Collaborating with or seeking aid from another student during an academic exercise without the permission of the person in charge of the exercise.
4. Knowingly using, buying, selling, stealing, transporting or soliciting in its entirety or in part, the contents of a test or other assignment unauthorized for release.
5. Substituting for another student, or permitting another student to substitute for oneself, in a manner that leads to misrepresentation of either or both students work.

B. **Plagiarism.** The appropriation, theft, purchase or obtaining by any means another's work, and the unacknowledged submission or incorporation of that work as one's own offered for credit. Appropriation includes the quoting or paraphrasing of another's work without giving credit therefore.

C. **Collusion.** The unauthorized collaboration with another in preparing work offered for credit.

D. **Abuse of resource materials.** Mutilating, destroying, concealing or stealing such materials.

E. **Computer misuse.** Unauthorized or illegal use of computer software or hardware through the TCU Computer Center or through any programs; terminals; or freestanding computers owned, leased or operated by TCU or any of its academic units for the purpose of affecting the academic standing of a student.

F. **Fabrication and falsification.** Unauthorized alteration or invention of any information or citation in an academic exercise. Falsification involves altering information for use in any academic exercise. Fabrication involves inventing or counterfeiting information for use in any academic exercise.

G. **Multiple submission.** The submission by the same individual of substantial portions of the same academic work (including oral reports) for credit more than once in the same or another class without authorization.

H. **Complicity in academic misconduct.** Helping another to commit an act of academic misconduct.

I. **Bearing false witness.** Knowingly and falsely accusing another student of academic misconduct.

Calculators and technology A calculator is permitted, but not required, for the class (although it may be **forbidden** for selected problems).

Homeworks Homeworks will be posted on the course web-page after most classes, and are due by the **beginning** of class, one week after they are assigned.

Homeworks must be handed in to me **in person**. If you are not able to do so, then you may have a friend hand it in, or, in exceptional circumstances, e-mail me a scanned copy by the due time. Late homeworks will be accepted **only** in case of an Official Absence, and only with **advance approval**.

You are encouraged to work with classmates on the homeworks, but you must write up your own work **independently** unless otherwise directed. The lowest homework grade will be dropped.

You should budget about **10 hours** per week for reviewing notes and doing homework. You **cannot** earn better than a C, regardless of exam scores, without satisfactory homework and class-participation grades.

Class participation Each non-review and non-exam day, at least one participation question will be asked. Volunteers will be chosen to work out the question on the board. If several people volunteer, priority will be given to those who have answered fewer questions. If a 'tie-breaker' is necessary, volunteers will be chosen in alphabetical order by last name.

The first question answered is worth 3% if correct. Subsequent questions answered are worth 0.5% if correct. Partial credit will be available for the first question only. The 'questions-answered' count will reset after the first and second exams.

You are expected to listen actively and courteously when your classmates are solving problems at the board. If you do not understand a solution, you should ask questions. If a classmate makes a mistake, you should offer a constructive suggestion for how to repair it. The remaining 1% of your class-participation grade is awarded on the basis of these questions and suggestions.

Midterms Midterms will be held in class on Thursdays: **February 14; March 21; and April 18**.

Re-scheduling of exams will be provided **only** in case of an Official Absence; or at my discretion, for extreme, documented reasons. In either case, you must tell me **one week** in advance, or as soon as is reasonably possible.

The final exam will be **Tuesday, May 7, 3–5:30 PM**, in a location to be announced. The time is set by the registrar, and **not** subject to change. In particular, **travel plans** are not a sufficient reason to miss a final.

Disability policy This course complies with the University disability statement at <http://www.ugradcouncil.tcu.edu/forms/DisabilitiesStatement.doc>, quoted in full below.

Texas Christian University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 regarding students with disabilities. Eligible students seeking accommodations should contact the Coordinator of Student Disabilities Services in the Center for Academic Services located in Sadler Hall, 1010. Accommodations are not retroactive, therefore, students should contact the Coordinator as soon as possible in the term for which they are seeking accommodations. Further information can be obtained from the Center for Academic Services, TCU Box 297710, Fort Worth, TX 76129, or at (817) 257-6567.

Adequate time must be allowed to arrange accommodations and accommodations are not retroactive; therefore, students should contact the Coordinator as soon as possible in the academic term for which they are seeking accommodations. Each eligible student is responsible for presenting relevant, verifiable, professional documentation and/or assessment reports to the Coordinator. Guidelines for documentation may be found at http://www.acs.tcu.edu/disability_documentation.asp.

Students with emergency medical information or needing special arrangements in case a building must be evacuated should discuss this information with their instructor/professor as soon as possible.