Math 295, Section 01: Discrete Mathematics
Spring 2011 Syllabus

1 Course Information

- Location and Time: TuTh 2:00-3:20pm, 209 Lee Drain Building

- Professor: Dr. Martin Malandro

- Department: Mathematics and Statistics

- Office: 409 Lee Drain Building

- E-mail (preferred method of contact): malandro@shsu.edu

- Phone number: (936) 294-1580

- Office Hours: Mon and Wed 1-2pm and 3-3:30pm, Tues 1-2 pm, and by appointment

- Required Materials:

  - Textbook: Discrete Mathematics and Its Applications (sixth edition) by Kenneth H. Rosen.

Course Description: This is a fast-paced course in mathematical proof, computational complexity, and discrete mathematical structures. This course is designed for computer science majors, so programming applications will be emphasized. Prerequisite: Calculus I (either MTH 142 or 299). Credit 3.

Course Objectives/Learning Outcomes: A successful student will...

- be able to write clear, concise, and correct mathematical proofs,

- understand the major methods of mathematical proof (direct, contrapositive, contradiction, induction) and their relationship to programming,

- be able to analyze code for efficiency and report their results using O, Ω, or Θ notation as appropriate,

- understand mathematical logic, truth tables, and their applications to programming and hardware design,

- be able to compute with modular arithmetic and understand its use in cryptography,

- understand basic graph theory and its applications to computation and hardware design, and

- understand the P vs. NP problem and be able to give specific examples of NP-complete problems.

  Other topics will also be covered.

2 Grading Policy

Your grade in the course will be calculated using the following weights:

Homework	20%
Exam 1	25%
Exam 2	25%
Final Exam	30%

Grading Scale:

A	90% or better final average
B	80–89% final average
C	70–79% final average
D	60–69% final average
F	59% or lower final average

Homework: I will assign homework on a regular basis. Some homework will be collected and graded, but more often I will ask students to present their homework solutions to the class. I will choose problems from the homework and call on students randomly to either put solutions to those problems on the board or allow me to project their written solutions on the document camera. A proper solution to a computational problem is an unbroken chain of logic leading to the answer, not just the answer itself. The proofs that you will write will have a general format that we will discuss in class.

Your homework score will be determined by your graded written work and your participation when I call on you to present in class. Obviously, you can only present if you are present. Attendance is important! I will grade all presentations on a 4-point scale (which I will convert to a percentage before I compute your semester average). Presentations and written homework assignments will be weighted equally. See the example grade calculation below.

Homework make-up policy: No make-ups for missed homework assignments or presentations will be available. Therefore, in calculating your homework average, I will drop your (1) lowest homework score.

Example homework score computation: Suppose on your written work you received scores of 100, 76, 92, and 40, and your presentation scores are 4, 4, 4, 4, 3, and 0. Your homework score for the semester would be

$$\frac{100 + 76 + 92 + 40 + 100 + 100 + 100 + 100 + 75}{9} = 87.0\%$$

Exams: Many exam problems will be similar to homework problems or examples worked in class. The final exam will be cumulative.

If you arrive late to an exam, you may still take the exam in the remaining time as long as nobody has finished the exam yet.

Exam make-up policy: If you miss an exam, you will be expected to show appropriate cause in writing. If you must miss an exam, I expect you to contact me beforehand. If that is impossible, then you must contact me no later than 24 hours after the exam. If you miss an exam and have not contacted me by this time, you forfeit your right to a make-up.

Academic Honesty Policy: Unless otherwise stated, you may work together on homework assignments and you may consult whatever sources you deem necessary while doing so. The purpose of the homework is to LEARN—specifically, to better your understanding of the underlying concepts and to gain proficiency in using them to solve problems.

Exams, on the other hand, exist for you to DEMONSTRATE what you have learned. They are individual endeavors, where no help is to be given or received. Cheating on an exam includes, but is not limited to, sharing answers or using any form of cheat sheet (note: notes programmed into a calculator count as a cheat sheet). If you are caught cheating on an exam, you will be forbidden from attending any further class meetings and will receive a grade of F in the course. You may also be referred to the dean on academic dishonesty charges.

Extra Credit Policy: There may be occasional opportunities for extra credit over the course of the semester. All extra credit opportunities will be announced in class. Under no circumstances will individual extra credit opportunities be available.

Grade Dispute Policy: All grade issues need to be brought to my attention within one week of having your grade returned/posted.

Final Exam Schedule: Thurs May 12, 2pm-4pm

3 Classroom Policies

Attendance Policy: I expect you to attend every class. If you miss a class, then I expect you to get notes from a classmate. I expect you to arrive to class on time.

Classroom Rules of Conduct: Students must refrain from behavior in class that disrupts the learning process. Students are prohibited from using tobacco products in class, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times or about inappropriate things, wearing inappropriate clothing, using cellphones, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Math-related questions and math-related discussion in the classroom are encouraged. However, chatter is disruptive to the learning process and will not be tolerated under any circumstances. Furthermore, any variation of the question "do we need to know this for the test?" is banned.

Use of Telephones and Text Messengers in Class: Generally speaking, you may not use cell phones, computers, or other devices capable of communication in class. The one exception is that during lecture periods, you may keep your cell phone on vibrate so that you can receive text messages in case of an emergency. You may not, however, be distracted or distracting to others in checking your text messages in class, and you may not send text messages in class. All messengers must be put away for exams. SHSU Academic Policy Statement 100728 states that *even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty.* So, if your phone goes off during a test, don't answer it or even pull it out to look at it.

4 Tentative Schedule

Calculus review (brief), algorithms and computational complexity, intro to proofs and number theory	Jan 19-Feb 23
Exam 1	Feb 24
More proofs, number theory, recursion	Feb 25-Apr 6
Exam 2	Apr 7
Graph theory, circuits, P vs. NP	Apr 8-May 6
Final Exam	Thurs May 12, 2pm-4pm

The date/time of the final exam is set by official SHSU policy. All other dates in this list are tentative and subject to change.

5 Additional Information

All information on this syllabus is subject to change. All changes will be announced in class. Further university policies regarding academic dishonesty, student absences on religious holy days, disabilities, and visitors in the classroom which apply to this course may be found at http://www.shsu.edu/syllabus/. If there is a conflict between information on this syllabus and official university policy, university policy takes precedence.