

Prerequisites: CSCI 121 with a grade of C or better, and either MATH112 or 151 with a grade of C or better.

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Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
2:00-2:50	2:00-2:50	2:00-2:50	2:00-2:50	2:00-2:50

Required Texts: Discrete Structures, Logic, and Computability, by Hein

Recommended: Lecture Slides available at <http://www.voutsadakis.com/teach.htm>. Use to study ahead of time, to review after class and as you see fit. Do not use to skip class; they are not written as substitutes for the lectures, in which the instructor will try to explain and to discuss difficult points.

Course Description: logic and proof techniques; recursion, recurrence relations and combinational methods; analysis of algorithms; algebraic structures; trees and graphs; Boolean algebra and computer logic; models of computation and formal languages. Emphasis will be on applications to computer science.

Course Objectives: Upon completion of CSCI 341, students will be able to:

1. Define, construct illustrative examples of, and make practical use of sets, tuples, lists, graphs, and trees.
2. Define, construct illustrative examples of, and make practical use of mathematical functions.
3. Define, construct illustrative examples of, and make practical use of regular and context-free languages.
4. Define, construct illustrative examples of, and make practical use of finite automata and pushdown automata.
5. Define, construct illustrative examples of, and make practical use of computability and complexity classes.
6. Define, construct illustrative examples of, and make practical use of Turing machines.
7. Construct a well-founded proof.
8. Perform complexity analysis techniques on algorithms.

Grading Scale and Policies:

Point Values:

Four Exams	4 x 50 = 200 points
Final exam	100 points
Quizzes	100 points
	<u>Total 400 points</u>

Grading Scale%:

94-100	A	70-74	C
90-93	A-	65-69	C-
87-89	B+	60-64	D+
84-86	B	55-59	D
80-83	B-	50-54	D-
75-79	C+	0-49	F

Grading Policies: You will be graded on correct methodology, i.e., if you provide an answer but show no work or your work is incorrect, you will receive no credit. Your solutions must be written in a connected, step-by-step logical fashion and all variables should be clearly defined. If your solution is not written clearly, you will not receive full credit. In many cases, setting up the correct mathematical model and using this model to solve a problem will be just as important as computing a numerical answer.

The homework exercises for each section covered are on the last pages of this handout. You should spend a lot of your math study time doing homework. If you are struggling with your homework seek help from your instructor or the tutors in the Learning Center.

The course outline on the next-to-last page is a projection of the general structure and content of the course. It is tentative and will be loosely followed.

Ground Rules:

- 1. Calculator:** The TI-83/84 Plus is the recommended calculator for this course. Your instructor reserves the right to ask you to solve problems in class, during quizzes and during exams without the use of a calculator. All other electronic devices, including computers, PDAs and cell phones, must be turned off for all class lecture sessions.
- 2. Purpose of Lecture:** Lectures are an opportunity for students to ask questions and seek clarification on material. This implies student preparation has been accomplished prior to class. Lecture is also the opportunity for the instructor to coordinate coverage of the material and present material that is historically or potentially difficult. It does not negate student preparation or study.
- 3. Attendance Policy:** Attendance is strongly encouraged. If you miss a class, or are late, you are still responsible for class notes and assignments. Moreover, you will be assigned a 0 score should a quiz take place during that missed lecture.
- 4. Make-up Policy:** Each exam should be taken at the designated time. An exam may be taken prior to or after the scheduled date, by agreement with the instructor, provided that the student provides a request with a documented valid excuse well in advance of the scheduled date. If an absence is unexcused, no make-up will be provided, either for exams or for quizzes.
- 5. Academic Integrity:** Students are expected to perform all assigned work themselves. Any form of cheating or plagiarism will be handled in accordance with the Academic Integrity Procedures. Violations of the University Academic Integrity Policy may result in an F course grade.
- 6. Testing:** Use of head phones, cell phones and hats during exams is prohibited.

University Policies

Online and Blended Course Attendance Policy

Students in online or blended classes are required to log in to the Course Management System (Blackboard, Wimba, TaskStream, etc.) and complete at least one “Academic Related Activity” within the Add/Drop period.

The Americans with Disabilities Act & Accommodations

In compliance with Lake Superior State University policies and equal access laws, disability-related accommodations or services are available to students with documented disabilities.

If you are a student with a disability and you think you may require accommodations you must register with Accessibility Services (AS), which is located in the KJS Library, Room 233, (906) 635-2355 or x2355 on campus. AS will provide you with a letter of confirmation of your verified disability and authorize recommended accommodations. This authorization must be presented to your instructor before any accommodations can be made.

Students who desire such services should meet with instructors in a timely manner, preferably during the first week of class, to discuss individual disability related needs. Any student who feels that an accommodation is needed – based on the impact of a disability – should meet with instructors privately to discuss specific needs.

IPASS (Individual Plan for Academic Student Success)

If at mid-term your grades reflect that you are at risk for failing some or all of your classes, you will be contacted by a representative of IPASS. The IPASS program is designed to help you gain control over your learning through proactive communication and goal-setting, the development of intentional learning skills and study habits, and personal accountability. You may contact Academic Services or email ipass@lssu.edu if you would like to sign up early in the semester or if you have any questions or concerns.

Tentative Course Outline:

Week	Dates	Monday	Tuesday	Thursday	Friday
1	08/27	1.1	1.1	1.2	1.2
2	09/03	BREAK	1.2	1.3	1.3
3	09/10	1.3	2.1	2.1	2.2
4	09/17	2.2	2.3	2.4	Exam 1
5	09/24	3.1	3.1	3.2	3.2
6	10/01	3.3	3.3	4.4	4.4
7	10/08	5.1	BREAK	5.1	Exam 2
8	10/15	5.2	5.3	5.3	5.4
9	10/22	5.4	5.5	5.5	5.6
10	10/29	11.1	11.1	11.2	11.2
11	11/05	11.4	11.4	11.5	Exam 3
12	11/12	11.5	11.6	11.6	11.7
13	11/19	11.7	12.1	BREAK	BREAK
14	11/26	12.1	12.3	12.3	Exam 4
15	12/03	12.5	12.5	12.5	Review

Homework Practice:

Section 1.1: 2-17

Section 1.2 (Sets): 1-16, 17a-c, 18a-c, 30, 31, 34, 36, 37

Section 1.3 (Ordered Structures): 1-13, 18-20

Section 2.1 (Definitions): 1-3, 33, 34

Section 2.1 (Useful Functions): **Ceiling** 4-6, 23-25, **gcd** 7-9, 31, 37, **mod** 10-14, 22, **log** 18-20, 30

Section 2.2 1-11

Section 2.3 1-6, 15-19

Section 2.4 1-9

Section 3.1 1-12, 16-18

Section 3.2 1-12

Section 3.3 1-11, 13

Section 4.4 1-6, 8-9, 11-12, 14-15

Section 5.1 1-9

Section 5.2 1-5, 7-11, 13-15

Section 5.3 1-11

Section 5.4 1-19, 22-25, 28-30, 33, 36

Section 5.5 1-10

Section 5.6 1-11, 14-20

Section 11.1 1-7, 10-11

Section 11.2 1-9

Section 11.3 1-5, 10, 11

Section 11.4 1-8, 10

Section 11.5 1, 2

Section 11.6 1, 2, 4-9

Section 11.7 5, 6, 8, 9

Section 12.1 1-3, 4a, 5a,b

Section 12.3 1-6

Section 12.5 1, 2, 4, 5, 7, 8