



## Math 321, Discrete Mathematics 1, CRN:12374

<b>Instructor:</b>	Mark Arrasmith
<b>Department:</b>	Mathematics, Statistics and Physics
<b>Office Location:</b>	Jabara Hall Room 314
<b>Telephone:</b>	316-978-3937
<b>Email:</b>	arrasmith@math.wichita.edu or mark.arrasmith@wichita.edu
<b>Preferred Method of Contact:</b>	In Person
<b>Office Hours:</b>	1pm to 2pm MWF
<b>Classroom; Days/Time:</b>	AH 214; 10:30am - 11:20am MWF
<b>Prerequisites:</b>	MATH 242 or equivalent with a grade point of 2.000 or better

### How to use this syllabus

This syllabus provides you with information specific to this course, and it also provides information about important university policies. This document should be viewed as a course overview; it is not a contract and is subject to change as the semester evolves. Any changes made over the semester will be communicated in class lectures.

### Academic Honesty

Students are responsible for knowing and following the Student Code of Conduct and the Student Academic Honesty Policy.

A standard of academic honesty, fairly applied to all students, is essential to a learning environment. Consequences of violating the honesty policy include possible grade reduction, failing grade for the semester, or dismissal from the college.

### Course Description

Cross-listed as CS 321. Provides a mathematical foundation essential to the entire computer science curriculum. Includes propositional and predicate logic, induction, recursion and counting techniques. Prerequisite: MATH 242 or equivalent with a grade point of 2.000 or better.

### Definition of a Credit Hour

Example for 3 credit hour class: Success in this 3 credit hour course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction and preparation/studying or course related activities for a total of 135 hours.

### Measurable Student Learning Outcomes

Using evaluations based on homework and exams upon successful completing of this course students will be able to:

1. Demonstrate knowledge and fluency in Propositional and Predicate logic using translation from natural language to and from symbols, operators, and quantification.
2. Prove mathematical statements using proof methods and strategies.
3. Demonstrate knowledge and fluency in Naive Set Theory, representations of sets, set operations, and the cardinality (both finite and infinite) sets.
4. Draw and describe functions, sequences, and series.
5. Apply matrix and zero-one matrix operations.
6. Demonstrate knowledge and fluency in Number Theory including the division algorithm, divisibility, and modulus arithmetic.

7. Apply integer representations, operations, and prove properties of the prime numbers.
8. Apply cryptography functions.
9. Demonstrate knowledge and fluency in recursion and induction.
10. Demonstrate knowledge and fluence in Mathematical Induction and relevent proofs and applications.
11. Apply counting and advanced counting techniques, state and apply the pigeonhole principle, permutations, combinations, and the Binomial Theorem.

## Required Texts/Readings Textbook

Discrete Mathematics and Its Applications, 7E, Rosen.

## Class Protocol

Students are expected to attend class and be on time. Students are expected to bring all necessary course materials with them. In most instances, this included the textbook, paper, pencil/pen, completed homework. If an absence is anticipated, the student will contact the instructor via e-mail or phone call PRIOR to the absence, if at all possible. Positive participation is expected. Mistakes are to be expected, respected, inspected, and corrected. Respect will be shown at all times. (Instructor/student and student/student). Should you find it necessary to make or take a phone call or text, please step outside the classroom to do so.

## Grading Scale

WSU uses a +/- grading scale for final grades and to calculate grade point averages. In this class, grades are assigned according to the following chart.

Points/percentages, as instructor chooses	Letter grade	Grade Points	Interpretation
92 or above	A	4.00	<i>The A range denotes excellent performance.</i>
90 to 91	A-	3.70	
88 to 89	B+	3.30	
82 to 87	B	3.00	<i>The B range denotes good performance.</i>
80 to 81	B-	2.70	
78 to 79	C+	2.30	
72 to 77	C	2.00	<i>The C range denotes satisfactory</i>
68 to 71	C-	1.70	
66 to 67	D+	1.30	
64 to 65	D	1.00	<i>The D range denotes unsatisfactory</i>
60 to 63	D-	0.70	
59 or below	F	0.00	<i>F denotes failing performance.</i>

## Assignments

Grades are assigned based on total points earned in four weighted categories: Attendance/Participation = 5%, Homework = 10%, Exams = 68%, and Comprehensive Final Exam = 17%. Assignments are given from the textbook sections as they are covered in the schedule at the end of this document. Assignments are due one week after they are assigned.

## Extra Credit

Extra credit is not available.

## Late Assignments

Late assignments are not accepted.

## Missed Assignments and Exams

Missed assignments are not accepted. Make-up examinations are given only if a student has a good reason and obtains permission directly from the instructor. To be eligible to make up a missed exam, the student must provide documentation as to the reason for missing exams. The student MUST contact the instructor BEFORE the exam, if at all possible. A telephone message left on voice mail (answering machine in my office or a message taken by a secretary in the department) will not be considered as permission to take a make-up examination. An email sent on the day of the exam will not be considered as permission to take a make-up examination. Should a need for a make-up exam be required, the student must take the exam at the testing center in Grace Wilkie Hall, Room 320. Cost is 10 dollars (cash, MasterCard, Discover, VISA). Photo-ID is required. You may call 316-978-3440 to verify the test is available at the testing center. You do not need an appointment. Be sure to allow sufficient time to complete the exam prior to the end of the testing hours. Testing Center hours: MRF 8:00 a.m. 5:00 p.m. and TW 8:00 a.m. 7:00 p.m. You must know the course number and the instructors name to avoid additional charges.

## Important Academic Dates

- For Fall semester 2016, classes begin Monday, August 22, 2016, and end Thursday, December 08, 2016.
- The last date to drop a class and receive a W (withdrawn) instead of F (failed) is Tuesday, November 1, 2016.
- There are no classes on Labor Day, Monday, September 05, 2016.
- There are no classes during Fall Break from Saturday, October 15, 2016 after 17:00 through Tuesday, October 18, 2016.
- There are no classes during Thanks Giving Break from Wednesday, November 23, 2016 through Sunday, November 27, 2016.
- *The final exam period is Wednesday, December 14, 2016 from 9:00am to 10:50am*

## Disabilities

If you have a physical, psychiatric/emotional, or learning disability that may impact on your ability to carry out assigned course work, I encourage you to contact the Office of Disability Services (DS). The office is located in Grace Wilkie Annex, room 150, (316) 978-3309 (voice/tty) (316-854-3032 videophone). DS will review your concerns and determine, with you, what academic accommodations are necessary and appropriate for you. All information and documentation of your disability is confidential and will not be released by DS without your written permission.

## Counseling & Testing

The WSU Counseling & Testing Center provides professional counseling services to students, faculty and staff; administers tests and offers test preparation workshops; and presents programs on topics promoting personal and professional growth. Services are low cost and confidential. They are located in room 320 of Grace Wilkie Hall, and their phone number is (316) 978-3440. The Counseling & Testing Center is open on all days that the University is officially open. If you have a mental health emergency during the times that the Counseling & Testing Center is not open, please call COMCARE Crisis Services at (316) 660-7500.

## Diversity and Inclusive

Wichita State University is committed to being an inclusive campus that reflects the evolving diversity of society. To further this goal, WSU does not discriminate in its programs and activities on the basis of race, religion, color, national origin, gender, age, sexual orientation, gender identity, gender expression, marital status, political affiliation, status as a veteran, genetic information or disability. The following person has been designated to handle inquiries regarding nondiscrimination policies: Executive Director, Office of Equal Opportunity, Wichita State University, 1845 Fairmount, Wichita KS 67260-0138; telephone (316) 978-3186.

## Intellectual Property

Wichita State University students are subject to Board of Regents and University policies regarding intellectual property rights. Any questions regarding these rights and any disputes that arise under these policies will be resolved by the President of the University, or the Presidents designee, and such decision will constitute the final decision.

## Shocker Alert System

Get the emergency information you need instantly and effortlessly! With the Shocker Alert System, we will contact you by email the moment there is an emergency or weather alert that affects the campus. Sign up at [www.wichita.edu/alert](http://www.wichita.edu/alert).

## **Student Health Services**

WSUs Student Health clinic is located in 209 Ahlberg Hall. Hours are 8:00am to 7:00pm (8:00 am to 5:00 pm on Fridays), though the clinic may be closed occasionally on Wednesdays from noon to 1:30pm. The telephone number is (316) 978-3620. In addition to outpatient and preventive care (including immunizations, a prescription service, and testing/counseling for sexually transmitted infections), Student Health can handle minor injuries. All services are confidential. For more information see [www.wichita.edu/studenthealth](http://www.wichita.edu/studenthealth).

## **Title IX**

Title IX of the Educational Amendments of 1972 prohibits discrimination based on sex in any educational institution that receives federal funding. Wichita State University does not tolerate sex discrimination of any kind including: sexual misconduct; sexual harassment; relationship/sexual violence and stalking. These incidents may interfere with or limit an individuals ability to benefit from or participate in the Universitys educational programs or activities. Students are asked to immediately report incidents to the University Police Department, (316) 978-3450 or the Title IX Coordinator (316) 978-5177. Students may also report incidents to an instructor, faculty or staff member, who are required by law to notify the Title IX Coordinator. If a student wishes to keep the information confidential, the student may speak with staff members of the Counseling and Testing Center (316) 978-3440 or Student Health Services (316)978-3620. For more information about Title IX, go to the Title IX page on WSU's website.

## **The Heskett Center and Campus Recreation**

Whether you are wanting to be active on campus, relieve the stress from classes or take care of your body, Wichita State Campus Recreation is the place for you. Campus Recreation, located inside the Heskett Center, contributes to the health, education, and development of Wichita State University students, faculty, staff, alumni, and community members by offering quality programs and services. With many programs and facilities which are free to all students and members, Campus Recreation offers its members limitless opportunities. For more information about our services see [www.wichita.edu/heskett](http://www.wichita.edu/heskett).

## **Video and Audio Recording**

Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Unless explicit permission is obtained from the instructor, recordings of lectures may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

## Tentative Schedule

Week	Topics (Readings/Lectures) Homework due at end of week	Homework/Exam Problems Assess
1	Propositional Logic and Applications (1.1 to 1.2)	Outcome 1
2	Propositional Equivalences and Quantifications (1.3 to 1.5) 1.1(1ace, 5, 7ac, 11ace, 15ace, 23ace, 27a, 31e, 37e, 41, 43a) 1.2(3, 5, 7c, 15, 17, 19, 21, 27, 29) 1.3(1ac, 3a, 7c, 9ae, 11ac, 15, 17, 23) 1.4(1, 5, 7, 15c, 21, 23c, 33c)	Outcome 1
3	Rules of Inference and Proofs (1.6 to 1.7) 1.5(1c, 3, 7b, 9ce, 13ce, 19c) 1.6(1, 3ac, 7, 9ac, 15ac, 23)	Outcomes 1 and 2
4	Proof Methods (1.7 to 1.8) 1.7(3, 7, 9, 13, 15, 19, 21, 27) 1.8(1, 7, 9, 13)	Outcomes 1 and 2
5	Exam 1 and Sets and Operations (2.1)	Outcomes 1 and 2
6	Functions, Sequences, and Summations (2.2 to 2.4) 2.1(1, 3, 7, 11, 13, 19, 21, 25, 35) 2.2(3, 7, 9, 13, 17, 27, 31) 2.3(3, 5ac, 7ac, 9ac, 15ac, 21, 35)	Outcomes 3 and 4
7	Cardinalities and Matrices (2.5 to 2.6) 2.4(3, 5c, 9c, 13ac, 17ac, 25ac, 31, 33, 35, 38) 2.5(1ace, 5, 7, 9) 2.6(2a, 3b, 11, 19, 26, 29)	Outcome 5
8	Exam 2 and Intro to Number Theory (4.1)	Outcomes 3-5
9	Integer Representation, Primes, and Properties (4.2 to 4.3) 4.1(3, 7, 9ac, 13c, 15, 23c, 33d) 4.2(1b, 3b, 5b, 7b, 17, 22ac, 27)	Outcomes 6 and 7
10	Applications of Number Theory and Cryptograpy (4.3 and 4.6) 4.3(3ef, 11, 17c, 25ac, 29, 33d, 39e, 43) 4.6(1b, 5b, 7, 9, 15, 25)	Outcome 8
11	Induction (5.1 to 5.3) 5.1(5, 7, 11, 21, 29, 33) 5.2(1, 3, 7, 11) 5.3(3ac, 5ac, 7, 9, 13, 15, 18, 23)	Outcomes 9 and 10
12	Exam 3 and Recursion (6.1)	Outcomes 6-10
13	Basics of Counting and the Pigeonhole Principle (6.1 to 6.3) 6.1(3, 7, 11, 13, 17, 21, 25, 31) 6.2(1, 5, 7, 10, 11, 17)	Outcome 11
14	Permutations, Combinations, and the Binomial Theory (6.4)	Outcome 11
15	Recurrence Relations (8.1 and 8.2) 6.3(7, 11, 15, 19, 21ac, 26) 6.4(3, 7, 11, 13, 19, 25, 31) 8.1(1, 5, 7, 11, 13, 27, 30) 8.2(3ac, 5, 7, 11, 19)	Outcome 11
16	Exam 4	Outcome 11
Finals	Comprehensive Final Exam	Outcomes 1 to 11