MAT 267: Discrete Mathematics, Union County College

Cranford, NJ
Dr. Cynthia Roemer, Department Chair
roemer@ucc.edu
www.ucc.edu

Per College policy, all course materials are password-protected. Instructional resources are available upon email request.

Knowledge Areas that contain topics and learning outcomes covered in the course

Knowledge Area	Total Hours of Coverage
Discrete Structures (DS)	42 hours

Where does the course fit in your curriculum?
Union County College offers this course both Fall and Spring semesters. Computer Science majors typically complete the required Discrete Mathematics course as sophomores. Students are eligible to enroll in this course after passing pre-calculus (MAT 143) with a grade of C or better, or scoring well enough on the College Level Mathematics Test to place directly into it. CS majors are also required to complete Calculus I (MAT 171).

What is covered in the course?
This course will develop advanced mathematics skills appropriate for students pursuing STEM studies such as Engineering, Science, Computer Science, and Mathematics. Topics include sets, numbers, algorithms, logic, computer arithmetic, applied modern algebra, combinations, recursion principles, graph theory, trees, discrete probability, and digraphs.

What is the format of the course?
This course earns 3 credit hours and consists of 3 lecture hours per week for 14 weeks. Discrete Mathematics offered at Union County College currently meets twice per week for 80 minutes each.

How are students assessed?
Students are assessed on a combination of homework, quizzes/tests, group activities, discussion, projects, and a comprehensive final exam. Students are expected to complete homework assignments/projects on a weekly basis. For a typical student, each assignment will require at least 3 hours to complete.

Course textbooks and materials
Text: Discrete Mathematics by Sherwood Washburn, Thomas Marlowe, & Charles T. Ryan (Addison-Wesley)

A graphing calculator (e.g. TI-89) and a computer algebra system (e.g. MAPLE) are required for completing certain homework exercises and projects.

Union County College has a Mathematics Success Center that is available for tutoring assistance for all mathematics courses.

Why do you teach the course this way?
Discrete Mathematics is a transfer-oriented course designed to meet the requirements of Computer Science, Engineering and Mathematics degree programs. Many of the Computer Science majors at Union County College

matriculate to New Jersey Institute of Technology. Furthermore, this course is designed to meet the following program objectives. (Also see Other Comments below). Upon successful completion of this course, students will be able to:

- Demonstrate critical thinking, analytical reasoning, and problem solving skills
- Apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
- Identify a problem and analyze it in terms of its significant parts and the information needed to solve it
- Formulate and evaluate possible solutions to problems, and select and defend the chosen solutions
- Construct graphs and charts, interpret them, and draw appropriate conclusions

Body of Knowledge coverage

KA	Knowledge Unit	Topics Covered	Hours
DS	Sets, Relations, Functions	all topics	6
DS	Basic Logic	all topics	9
DS	Proof Techniques	all topics	9
DS	Basics of Counting	all topics	7
DS	Graphs and Trees	all topics except Graph Isomorphism (core tier-2)	6
DS	Discrete Probability	all topics except Conditional Independence (core tier-2)	5

Other comments

Correlation of Program Objectives, Student Learning Outcomes, and Assessment Methods

Program Objectives	Student Learning Outcomes	Assessment Methods
Demonstrate critical thinking, analytical reasoning, and problem solving skills	Recognize, identify, and solve problems using set theory, elementary number theory, and discrete probability Recognize, identify, and apply the concepts of functions and relations and graph theory in problem solving Apply proof techniques in logic	**Written:** Homework assignments, examinations in class, and projects to be completed at home **Verbal:** Classroom exercises and discussion
Apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems	Recognize, identify, and solve problems using set theory, elementary number theory, and discrete probability Recognize, identify, and apply the concepts of functions and relations and graph theory in problem solving	**Written:** Homework assignments, examinations in class, and projects to be completed at home **Verbal:** Classroom exercises and discussion

Identify a problem and analyze it in terms of its significant parts and the information needed to solve it	Recognize, identify, and solve problems using set theory, elementary number theory, and discrete probability Recognize, identify, and apply the concepts of functions and relations and graph theory in problem solving Apply proof techniques in logic	**Written:** Homework assignments, examinations in class, and projects to be completed at home **Verbal:** Classroom exercises and discussion
Formulate and evaluate possible solutions to problems, and select and defend the chosen solutions	Recognize, identify, and solve problems using set theory , elementary number theory, and discrete probability Recognize, identify, and apply the concepts of functions and relations and graph theory in problem solving Apply proof techniques in logic	**Written:** Homework assignments, examinations in class, and projects to be completed at home **Verbal:** Classroom exercises and discussion
Construct graphs and charts, interpret them, and draw appropriate conclusions	Recognize, identify, and apply the concepts of functions and relations and graph theory in problem solving	**Written:** Homework assignments, examinations in class, and projects to be completed at home **Verbal:** Classroom exercises and discussion