BERGEN COMMUNITY COLLEGE
DIVISION OF MATHEMATICS, SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS

COURSE SYLLABUS

MAT-285 DISCRETE MATHEMATICS

COURSE DESCRIPTION: Discrete Mathematics is a study of mathematical concepts and techniques that form the foundation for many upper level mathematics courses. Topics considered include sets, logic, proof techniques, functions, recurrence relations, complexity of algorithms, counting techniques, discrete probability, relations, graphs and trees, Boolean Algebras, finite state machines, and finite automata. Mathematical reasoning and proofs will be stressed.

CREDITS/HOURS: 4 lecture hours   4 credits

PREREQUISITE: MAT-280 with a grade of C or better or by permission of the Department Chair.

GEN'L ED COURSE: No

STUDENT LEARNING OBJECTIVES: **As a result of meeting the requirements for this course, students will:**

1. understand the fundamental concepts of sets and logic and how they are used in real-world applications.
2. be able to employ proofs to validate properties and arguments.
3. understand the fundamental concepts of functions and relations.
4. be able to solve first and second order recurrence relations.
5. be able to perform fundamental analysis of an algorithm.
6. understand the properties of graphs and trees, and be able to apply them to solve problems that can be represented by these structures.
7. be able to apply counting techniques and fundamental laws of probability in the solution of problems.
8. understand the properties of a Boolean Algebra and its application to combinatorial circuits.
9. understand the representations and applications of finite state machines and finite automata.

ASSESSMENT MEASURES: Each of the above listed student learning objectives will be assessed by,
1. Written assignments and/or quizzes.
2. Written examinations
3. Other, as announced by the professor

COURSE GRADE: Students should refer to the professor's grading policy which will be distributed during the first meeting of the class. Attendance and lateness policies are to be determined by the professor for each section of the course. These will be established in writing on the individual course policies.

TEXTBOOK: Discrete Mathematics, (revised) 3rd edition, Lipschutz and Lipson
Schaum's Outlines, McGraw-Hill Publisher, ISBN: 978-0-07-161586-0
Lecture notes (LN) will be distributed for many of the topics.

COURSE CONTENT:

TOPIC	READING
Set Theory	1.1 – 1.7
Logic	4.1 – 4.9
Proof Techniques and Mathematical Induction	LN, 1.8, 11.3, 11.5, 11.8
Functions and the Complexity of Algorithms	LN, 3.1 – 3.3, 3.6, 3.8, 3.9
Recurrence Relations	LN, 6.6 – 6.9
Relations	2.1 – 2.9, 14.3
Graphs and Trees	LN, 8.2 – 8.8, 9.1 – 9.4, 9.6, 9.9, 10.1, 10.2, 10.8
Counting Techniques	5.1 – 5.8, 6.1 – 6.3
Discrete Probability	LN, 7.1 – 7.6
Boolean Algebra and Circuits	LN, 15.1 – 15.4, 15.8 – 15.12
Finite State Machines and Finite Automata	LN, 12.5, 13.1 – 13.2

REFERENCES: <u>Discrete Mathematics</u>, Johnsonbaug, Pearson, Prentice-Hall
Discrete Mathematics with Applications, Epp, Brooks/Cole, Cengage Learning
<u>Discrete Mathematics and its Applications</u>, Rosen, McGraw-Hill

ELECTRONIC DEVICES: **The Department of Mathematics prohibits the use of cell-phones, PDA's, laptops, headphones, IPODs and other such devices in mathematics classes unless otherwise specified in the grading policy provided by the professor at the beginning of the semester.**

FACULTY ABSENCE PROCEDURE: CLASS CANCELLATIONS may be found at http://www.bergen.edu/classcancellations
A list is also posted in a glass case near A-129, the main corridor on the first floor and in Ender Hall. If a cancelled class is not listed, it should be reported to the Department Office (B-302) or the Adjunct Office (C-107).

WEBSITE: Go to http://www.bergen.edu/academics/academic-divisions-departments/mathematics for more information regarding the Mathematics Department.

STUDENT SUPPORT SERVICES:			
	Learning Assistance Center	Room: L-125	879-7489
	Math and Science Walk-In	Room: L-131	879-7489
	Office of Specialized Services	Room: L-115	612-5269