COURSE STRUCTURE

COURSE NAME	**APPLIED DISCRETE MATHEMATICS**
CODE	**MTH 2215**
CLASS MEETING TIME	
LOCATION	**HUST**
WORTH	**3 credits**
PREREQUISITE	**MTH 1112, MTH1125**
INSTRUCTOR	**Dr. Ho Minh Toan** **Ph.D. in Mathematics** **hmtoan@math.ac.vn**
OFFICE HOURS: Quoc Viet.	**Friday 10-12 at 105-A5, Institute ò Mathematics, 18 Hoang**

COURSE OBJECTIVES

- To develop students' mathematical reasoning, including formal logic and proofs. Specifically:
  - The student should be able to manipulate truth tables and logical operators, including implication, as well as understand propositional and predicate logic and quantification, and recognize logical fallacies.
  - The student should demonstrate competence in several styles of proof, including proof by contradiction and proof by induction.
- To develop students' knowledge of relations and their properties. Specifically:
  - The student should demonstrate a grasp of the basic properties of relations, including reflexive, symmetric, antisymmetric and transitive relations. The student should be able to recognize partial orderings and equivalence relations. The student should understand the concept of a function.
- To develop the basis for combinatorial analysis. Specifically:
  - The student should be able to compute permutations and combinations and make use of the Pigeonhole Property and the Principle of Inclusion/Exclusion.
- To introduce the mathematics of recurrences.
- To develop students' ability to manipulate abstract structures such as sets, graphs, and trees. Specifically:

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  - The student should understand the formal properties of directed and undirected graphs. The student should demonstrate familiarity with the abstract representation of graphs, and with major graph traversal algorithms and their properties.
- To provide students with the basic tools to compare the relative efficiency of algorithms. Specifically:
  - The student should be able to compute the Big-O of functions, and to demonstrate knowledge of the comparative growth of functions.

COURSE FORMAT

Lecture: 3 hrs per week

STUDENT EVALUATION

Attendance: 10%, Assignment/Quizzes: 20%, Midterms: 30% , Final exam: 40%

EXAMINATION FORMAT

Midterm: 2 hours, Final: 2.5 hours.

GRADING SCALE

A (90% - 100%)
B (80% - 89%)
C (70% - 79%)
D (60% - 69%)
0 - 59% : Fail

BASIC TEXT

Discrete Mathematics and Its Applications: And Its Applications, McGraw-Hill Higher Education; 7th edition , by Kenneth H. Rosen.

CLASS SYLLABUS

The course will cover the following topics from the text book:

Week(s)	Topics
1-2	**Logic** Propositional equivalences, sets and set operations, functions, sequence and summations .
3-4	**Methods of proof** Mathematical inductions, recursive algorithms.
5-6	**Set Theory and counting** Pigeonhole Principle, permutations and combinations .
7	**Modular Arithmetic** Congruence, linear congruence, applications of number theory.
8	**Midterm**
8-9	**More Counting** Discrete probability, generalized permutations and combinations, inclusion-exclusion.
10 - 12	**Relations** Recurrence relations, n-ary relations, solving recurrence relations.
13 - 14	**Graphs and trees**

Introduction to graphs, Euler and Hamilton paths, planar graphs, introduction to trees, applications of trees

15 **Final Examination.**

CLASS REGULATION: The students are expected to attend all scheduled classes. *Mobile phone* is not allowed to use in class

ABSENCES: The following is the official policy of Troy University as written in the Undergraduate *Bulletin*.

"In registering for classes at the University, undergraduate students accept responsibility for attending scheduled class meetings, completing assignments on time, and contributing to class discussions and the exploration of ideas.

"A student will be excused if he/she has been absent from a class by reason of circumstances beyond his/her control or if the student has been required to attend an activity sponsored by the University. Faculty members who sponsor activities that require class absences must send a list of student names to each faculty member concerned at least three days before the scheduled absence.

"Faculty members may levy academic penalties upon unexcused absences; however, such penalties for unexcused absences will be a part of each course syllabus and will be distributed to each class at the beginning of each term, a copy filed in the departmental office."

For all sections, each student is to be in class and prepared for class each scheduled class day. A student whose absence is not warranted by an official excuse or by a doctor's written statement will receive a grade of zero for work due in class and for all work done in class on the day of the absence.

Your attendance and participation in class are essential for a complete learning experience. The type of learning that takes place between you, your instructor, and your classmates cannot be acquired on an individual basis. This class meets only one day per week, and much information must be covered to help you maximize your potential for success at TROY and in life after the University. **THEREFORE, IF YOU MISS MORE THAN TWO CLASSES--EXCUSED OR UNEXCUSED—YOU WILL RECEIVE A FAILING GRADE FOR THE COURSE.**

INCOMPLETE GRADE POLICY

• If a student is unable to complete all course grading requirements, the student may be eligible to request the assignment of an incomplete grade. An incomplete grade is not automatically assigned by the instructor, but must be requested by the student and approved by the instructor. The decision to approve or reject a student's request for an incomplete grade is at the discretion of the instructor using the following criteria:

1. Student submits a completed "Petition for an Incomplete Grade" form prior to assignment of a course grade.
2. Student's progress in the course is deemed satisfactory. This includes having completed over 50% of the course materials, meaning all 50% of assignments/exams.
3. Student is passing the course when the request is made.

LATE WORK: Only those students who have been excused from class may hand in work late, and they must hand in all assigned work within on week from the last day of the excused absence.

ACADEMIC DISHONESTY:

Academic dishonesty is not accepted in this course. Cheating on a map quiz will result in a deduction of 10 points from your overall assessment. Cheating on an exam or handing in plagiarized materials will result in an automatic failing grade for the course. Troy University's definition of misconduct is defined in the student handbook, *The Oracle,* which may be accessed at http://trojan.troy.edu/oracle/assets/documents/2012-2013_Oracle.pdf .

AMERICANS WITH DISABILITIES ACT: Any student whose disabilities fall within ADA must inform the instructor at the beginning of the term of any special needs or equipment necessary to accomplish the requirements for this course.
THIS SYLLABUS IS TENTATIVE AND SUBJECT TO CHANGE. The instructor may make changes if deemed necessary. Changes will be announced in class.