

University of Macau
Faculty of Science and Technology
Computer and Information Science Department
SFTW110 – Discrete Structures
Syllabus
Fall 2011

Part A – Course Outline

Compulsory course in Computer Science

Catalog description:

(2.5-1) 3 hours credit. Set Theory, Logic, Counting, Relations, Graph Theory, and other topics. Students will be trained in developing skills in mathematics, such as Modeling, Abstraction and Proof Methods.

Prerequisites:

None

Textbook(s) and other required material:

Discrete Mathematical Structures, Kolman, Busby, Ross, Pearson Prentice Hall, 6th Edition, 2009, 0-13-207845-7; 978-0-13-207845-0 (Required)

References:

Discrete Mathematics and its applications, Rosen, Kenneth H. McGraw-Hill Higher Education, 2007, 0071244743; 9780071244749

Major prerequisite by topic:

College algebra or pre-calculus.

Course objectives*:

1. Introduce a formal system on which mathematical reasoning is based. [a, e, k]
2. Develop an understanding of mathematical statements (theorems) and how to read and construct valid mathematical arguments (proofs). [a, e]
3. Develop the ability to see a problem from a mathematical perspective. [a, e]
4. Introduce various problem-solving strategies, especially thinking algorithmically. [a, e]
5. Introduce important discrete data structures such as sets, relations, discrete functions, graphs and trees. [a, e]
6. Motivate the need for mathematical structures and techniques by introducing computing applications. [a, e, k]

Topics covered:

1. Introduction to Discrete Mathematical Structures.
2. Sets and Sequences.
3. Integers and Matrices.
4. Mathematical Structures.
5. Propositions, Logical Operations, and Conditional Statements.
6. Methods of Proof and Mathematical Induction.
7. Counting, Pigeonhole Principle, and Recurrence Relations.
8. Relations and Digraphs.
9. Functions and Growth of Functions.
10. Trees.

Class/laboratory schedule:

2.5-hour lecture per week (14 weeks)

1-hour tutorial class per week (14 weeks)

Contribution of course to meet the professional component:

This course presents the foundations of many basic computer related concepts, such as set theory, logic, graph theory, and combinatorics.

Relationship to Computer Science program objectives and outcomes:

This course primarily contributes to Computer Science program outcomes that develop student abilities to:

- (a) an ability to apply knowledge of mathematics, science, and engineering.
- (e) an ability to identify, formulate, and solve engineering problems.

The course secondarily contributes to Computer Science program outcomes that develop student abilities to:

- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Relationship to CS program criteria:

Criterion	DS	PF	AL	AR	OS	NC	PL	HC	GV	IS	IM	SP	SE	CN
Scale: 1 (highest) to 4 (lowest)	1													

Discrete Structures (DS), Programming Fundamentals (PF), Algorithms and Complexity (AL), Architecture and Organization (AR), Operating Systems (OS), Net-Centric Computing (NC), Programming Languages (PL), Human-Computer Interaction (HC), Graphics and Visual Computing (GV), Intelligent Systems (IS), Information Management (IM), Social and Professional Issues (SP), Software Engineering (SE), Computational Science (CN).

Coordinator:

Yan Zhuang

Persons who prepared this description:

Yan Zhuang, Sept.1, 2010.

Part B General Course Information and Policies

Fall 2011

Instructor: Dr. Yan Zhuang
Office Hour: MW 3:30 – 5:00PM or by appointment
Email: syz@umac.mo

Office: N414
Phone: 8397-4464

Time/Venue: To Be Announced

Assessment:

Final assessment will be determined on the basis of:

Homework: 10%
Quiz: 25%
Mid-term Test: 30%
Final Exam: 35%

Grading Distribution:

100—93 A	92—88 A-	87—83 B+	82—78 B	77—73 B-	72—68 C+
67—63 C	62—58 C-	57—53 D+	52—50 D	Below 50 F	

Comment:

The objectives of the lectures are to explain and to supplement the text material. Students are responsible for the assigned material whether or not it is covered in the lecture. Students who wish to succeed in this course should work all homework and exercises given in tutorial classes. You are encouraged to look at other sources (other texts, etc.) to complement the lectures and text.

Homework Policy:

Doing exercises is of vital importance to help the students to master the concepts covered, therefore:

- There will be approximately 10 homework assignments.
- Homework is due one week after assignment unless otherwise noted, no late homework is accepted.
- Possible revision of homework grades may be discussed within one week from the return of the marked homework.
- The course grade will be based on the average of the homework grades.

Test

One quiz, one mid-term test and one final exam will be held for a whole semester.

Note

- Attendance at both lectures and tutorial classes is strongly recommended.
- Check UMMoodle (<http://ummoodle.umac.mo>) for announcement, homework and lectures. Report any mistake on your grades within one week after announcement.
- No make-up test is give except for CLEAR medical proof.
- No exam is given if you are 15 minutes late in the mid-term test and 30 minutes late in the final exam. Even if you are late in the exam, you must turn in at the due time.
- Cheating is absolutely prohibited by the university.