



SCHOOL OF SCIENCE, ENGINEERING & HEALTH
DEPARTMENT OF SCIENCE & ENGINEERING
MAT 223: DISCRETE MATHEMATICS I
JANUARY- APRIL 2017 SEMESTER

Lecturer: SAMUEL KIRANGA DAY: Tuesday TIME: 1330 - 1630hrs

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1.0: COURSE PURPOSE

This course is intended to help students to understand mathematical reasoning, teach them how to work with discrete structures and solve problems by use of algorithms.

2.0 Learning outcomes

At the end of the course the learner should be able to:

- a) Read, comprehend and construct mathematical arguments;
- b) Perform combinatorial analysis to solve counting problems;
- c) Work with discrete structures;
- d) Apply discrete mathematics to construct models; and
- e) Construct algorithms to solve problems and to use the computers to implement the algorithms.

3.0 Delivery plan

Week 1: Elementary notations: proof primer, logical statements.

Week 2: Sets.

Week 3: inductively defined sets and other structures.

Week 4: Language constructions **ASSIGNMENT I.**

Week 5: Functions: definitions, constructing functions, properties of functions, construction techniques

Week6: CAT I

Week 7: Recursively defined functions, equivalence, order and inductive proof.

Week 8: Properties, equivalence relations and optimal algorithms.

Week 9: Elementary counting principles, solving recurrences. **ASSIGNMENT II.**

Week 10: Elementary logic, propositional calculus.

Week 11: CAT II

Week 12: Formal reasoning systems, predicate logic, equity.

Week 13: Program correctness, computational logic.

Week 14: Algebraic structures and techniques, graphs, and trees.

4.0: Teaching Methodologies

The course will be conducted by way of lectures, tutorials, group discussions and problem-solving.

5.0: Course procedures, requirements & Evaluations

- The course carries three credit hours and the class will be once per week for fourteen weeks.
- The course comprises lectures, class work, assignments, a continuous assessment test and a final written examination.
- Assignment must be handed-in on or before the indicated deadlines.
- Students are required to sit for all CATs. Only for valid reasons (evidence provided) will a Make up CAT be administered.
- Attendance and punctuality must be observed except for unusual circumstances with prior notification.

6.0: Class attendance

1. **Class attendance is mandatory in Daystar University.** There are no “excused” absences for any reason including sickness or student activities. Any student who misses more than 25% of the scheduled classes (including the first week of each semester) will receive a grade E (failure due to poor attendance) for the course. Please note that informing the lecturer, or anyone else, of your intended absence does not exempt you from this rule. The 25% is to allow for sickness, emergencies, or student activities that could not have been planned for.
2. It is the responsibility of the student to ensure that they sign the attendance register each time. Your signature will be the only evidence of your attendance.
3. Signing the attendance record on behalf of another person is an offence and will result in disciplinary action. This is the case even if it is the lecturer who has asked you to sign for a day that the class didn’t meet.

7.0 Methods of Evaluation

Continuous Assessment Tests:

Assignments	-	20%
CAT I	-	10%
CAT II	-	10%
End of semester Examination	-	60%
TOTAL		100%

GRADE SYSTEM

Marks (%)	Grade	G.PA		Marks (%)	Grade	G.PA	
91 - 100	A	4.0		61 -65	C+	2.3	
81 - 90	A-	3.7		56 - 60	C	2.0	
76 - 80	B+	3.3		51 - 55	C-	1.7	
71 - 75	B	3.0		46 - 50	D+	1.3	
66 - 70	B-	2.7		41 - 45	D	1.0	
				40 & below	F	0.0	

8.0: Recommended Text Books

- Rosen, K. H. (2012). *Discrete Mathematics and Its Applications*. McGraw-Hill, ISBN 0073383090, 9780073383095
- Johnsonbaugh, R. (2008). *Discrete Mathematics*. Prentice Hall, ISBN 0131593188, 9780131593183
- Biggs, N. (2002). *Discrete mathematics*. Oxford University Press, ISBN 0198507178, 9780198507178
- Grimaldi, R. P. (1994). *Discrete and Combinatorial Mathematics: An Applied Introduction*. Addison-Wesley, ISBN 0201549832, 9780201549836
- O'Donnell, J., Hall, C., Page, R. L., & Page, R. (2006). *Discrete Mathematics Using a Computer*. Springer, ISBN 1846282411, 9781846282416
- Hein, J. L. (2003). *Discrete mathematics*. Jones & Bartlett Publishers, ISBN 0763722103, 9780763722104