

COURSE SPECIFICATION

1- Course Data

Course Title	Mathematics I	Code: Math. 101
Academic year / Semester	2013 / 2014, Autumn	
Program on which the course is given	All	
Major or Minor element of program	Major	
Department offering the course	Basic Science	
Prerequisites	None	
Credit hours	3	
Contact hours per week	Lecture: 4 Hours	Tutorials: 2 Hours

2- Course Aims

- To provide the students essential information and fundamentals of Differential and Integral Calculus and their applications in engineering.
- To teach the students the basic concepts of derivative and integral of real functions of single variable.
- To apply mathematical techniques for modeling, solving and analyzing real problems.

3- Intended Learning Outcome (ILOs)

a- Knowledge and understanding	a1- Identify theories and fundamentals of mathematics. a2- Define mathematical methods for solving problems. a3- Outline mathematical techniques for modeling real problems.
b- Intellectual Skills	b1- Analyze mathematical problems and categorize them. b2- Solve practical problems using mathematical methods. b3- Make mathematical models to real problems in the light of available data and information.
c- Professional and Practical Skills	c1- Apply mathematical logic and techniques for solving real life problems c2- Diagnose solutions to real life problems. c3- Prepare professional reports via mathematical logic.
d- General and Transferable Skills	d1- Communicate effectively using different means. d2- Use information technology for obtaining information. d3- Work in a group and lead a team. d4- Manage time effectively and conduct self learning .

4- Contents

Topic	No. of Hours
Introduction and basic concepts	4
Elementary functions: polynomial, exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic, inverse hyperbolic functions.	4
Limits and continuity	4
Derivative of elementary functions, higher derivatives , implicit differentiation	8
Applications: Extreme values, inflection points, tangent and normal, curve tracing.	8

Mean value theorems, Taylor's and Maclurin's expansion.	4
Indefinite integrals, integrals of elementary functions, integration by parts, integration by partial fractions, integration by substitution, integration of trigonometric and hyperbolic functions.	12
Definite integral and its properties	4
Applications: area, volume of solids of revolution, arc length, surface area	4
Simple differential equations, improper integrals, numerical integration, trapezoidal rule, Simpson's rule	4

5- Teaching and Learning Methods for Students with Special Needs

White board, Prepared notes, Data Show.

6- Learning and Teaching Activities

Tools	Intended Learning Outcomes Achieved
Interactive Lectures	ILOs: a1, a2, a3, b1, b2, b3, c1, c2, c3.
Tutorials	ILOs: b1, b2, b3, c1, c2, c3.
Assignments and Homework	ILOs: d1, d2, d3, d4.

7- Student Assessment

Assessment Strategy

Tools	Intended Learning Outcomes Achieved
Quizzes	ILOs: a1, a2, b1, b2, c1, c2.
Written Exams	ILOs: a1, a2, a3, b1, b2, b3, c1, c2, c3.
Assignments and Homework	ILOs: d1, d2, d3, d4.

Assessment Details

Methods of Assessment	Grading Mode	Weighting %	Minimum Pass Mark	Outline Details
Quizzes	20	20 %		Weeks: 4, 11
Assignments	10	10 %		Weeks: 3, 5, 10, 12
Mid-Term Exam	30	30 %		Week 8: 1 hour
Final Exam	40	40 %	13	Week 15: 2 hours

8- List of References

a- Course Notes	Lecture notes.
b- Required Books (text books)	<ul style="list-style-type: none"> • Calculus, 3rd Edition, R. T. Smith and R.B. Minton, McGraw Hill, U.S.A, 2009. • Calculus, 6th Edition, James Stewart, Thomson Brooks / Cole, U.S.A, 2008.
c- Recommended Books	<ul style="list-style-type: none"> • Advanced Engineering Mathematics, E. Kreyszig, John Wiley and Sons, New York, 1999.
d- Periodicals, web sites,...	www.mhhe.com www.intmath.com www.thomsonrights.com

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Head of Department: