



COURSE SPECIFICATION

1- Course Data

Course Title	Differential and Integral Calculus I	Code: BAS 111
Academic year / Semester	2013 / 2014, First Semester	
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



Culture and Science City

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	10	10 %		Weeks: 4, 11
Assignments	10	10 %		Weeks: 3, 5, 10, 12
Mid-Term Exam	20	20 %		Week 8: 1 hour
Final Exam	60	60 %	18	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: