Mathematics – Credit Hours **All Programs / Departments**

Course Plan **2017** **Dr. Mohamed Eid**

Course Title: Engineering Mathematics 1 Code: EMP 101
Teaching Hours : 4 Lecture : 2 Tutorial : 2

Contents

Week	Topic	No. of Hours	
		Lecture	Tutorials
1	**Introduction** Elementary functions: exponential, logarithmic, trigonometric functions and polynomials.	2	2
2	Limits and continuity.	2	2
3	Derivative of elementary functions.	2	2
4	Maximum and minimum values.	2	2
5	Taylor's expansion, L'Hopital's rule, Mean value theorem.	2	2
6	Integral of exponential, trigonometric functions and polynomials.	2	2
7	Mid-Term Exam 1	1	
8	Algebra of matrices.	2	2
9	Eigenvalues and eigenvectors of square matrices.	2	2
10	Linear systems and methods of solution.	2	2
11	Mid-Term Exam 2	1	
12	Algebra of complex numbers.	2	2
13	Partial fractions.	2	2
14	Binomial theorem.	2	2
15	Final Exam	2	

Assessment Schedule

Methods of Assessment	Grading / Marks	Weighting %	Outline Details
Assignments	10	10 %	Week: All
Mid-Term Exam 1	30	30 %	Week: 7 1 hour
Mid-Term Exam 2	20	20 %	Week: 11 1 hour
Final Exam	40	40 %	Week : 15 2 hours

List of References

Course Notes	Lectures Notes (PDF)
Required Books	• Calculus, 6th Edition, James Stewart, Thomson Brooks / Cole, U.S.A, 2008. • The Theory of Matrices, 2nd Edition, P.Lancaster and M.Tismenetsky, Academic Press, London, New York, 1985.
Recommended Books	Advanced Calculus With Applications In Statistics, 2nd Edition, A.I. Khuri, John Wiley & Sons, Inc., New Jersey, 2003.
Periodicals, web sites	www.intmath.com www.thomsonrights.com

Mathematics – Credit Hours **All Programs / Departments**

Course Plan **2017** **Dr. Mohamed Eid**

Course Title: Engineering Mathematics 2 Code: EMP 102
Teaching Hours : 4 Lecture : 2 Tutorial : 2

Contents

Week	Topic	No. of Hours	
		Lecture	Tutorials
1	**Introduction** Hyperbolic functions and its derivatives	2	2
2	Inverse functions, Implicit differentiation.	2	2
3	Methods of integration: Method of partial fractions, Integration by parts.	2	2
4	Integration by reduction.	2	2
5	Integration by substitution, Definite integral and its properties.	2	2
6	Applications : Plane area, arc length, volumes and surface area	2	2
7	Mid-Term Exam 1	1	
8	Fundamentals of analytical geometry and coordinates, Pair of lines.	2	2
9	Equation of circle, radical axis, orthogonal circles.	2	2
10	Conic sections, Equation of parabola and its properties.	2	2
11	Mid-Term Exam 2	1	
12	Equation of ellipse and equation of hyperbola and their properties.	2	2
13	Line in space and the equation of plane.	2	2
14	Quadratic surfaces : Sphere, Cylinder, Cone.	2	2
15	Final Exam	2	

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Mathematics – Credit Hours **All Programs / Departments**

Course Plan **2017** **Dr. Mohamed Eid**

Course Title: Engineering Mathematics 3 Code: EMP 201
Teaching Hours : 4 Lecture : 2 Tutorial : 2

Contents

Week	Topic	No. of Hours	
		Lecture	Tutorials
1	**Introduction** Parametric relations, Derivative of parametric relations.	2	2
2	Applications of Integral in parametric form: Plane area, Volumes, Arc length, Surface area.	2	2
3	Functions of several variables, Partial derivatives	2	2
4	Envelope of family of curves, Maximum and minimum values.	2	2
5	Conditional extrema and optimization problems.	2	2
6	Vectors algebra, Derivative of vector functions and gradient.	2	2
7	Mid-Term Exam 1	1	
8	Periodic functions, Piecewise continuous function, Fourier series.	2	2
9	Harmonic analysis, Even and odd functions.	2	2
10	Double integral, Line integral, Closed integral.	2	2
11	Mid-Term Exam 2	1	
12	Complex functions, Analytic functions, Harmonic functions.	2	2
13	Complex integrals and line integrals.	2	2
14	Matlab in solving mathematical problems.	2	2
15	Final Exam	2	

Assessment Schedule

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Assignments	10	10 %	Week: All
Mid-Term Exam 1	30	30 %	Week: 7 1 hour
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Final Exam	40	40 %	Week : 15 2 hours

List of References

Course Notes	Lectures Notes (PDF)
Required Books	"Advanced Engineering Mathematics", A. Jeffrey, Harcourt / Academic Press, New York, 2002.
Recommended Books	"Advanced Engineering Mathematics", E. Kreyszig, John Wiley and Sons, New York, 1999.
Periodicals, web sites	www.intmath.com www.academicpress.com

Mathematics – Credit Hours **All Programs / Departments**

Course Plan **2017** **Dr. Mohamed Eid**

Course Title: Engineering Mathematics 4 Code: EMP 202
Teaching Hours : 4 Lecture : 2 Tutorial : 2

Contents

Week	Topic	No. of Hours	
		Lecture	Tutorials
1	**Introduction** Basic concepts of ordinary differential equations.	2	2
2	First order differential equations: Separable, Homogeneous, Exact Linear equations.	2	2
3	Higher order differential equations with constant coefficients.	2	2
4	Laplace transformations	2	2
5	Inverse Laplace transformations.	2	2
6	Solving ordinary differential equations by Laplace transformations.	2	2
7	Mid-Term Exam 1	1	
8	Introduction to numerical analysis, Bisection method for solving equations of one variable.	2	2
9	Numerical differentiation, Numerical integration.	2	2
10	Curve fitting, regression line, correlation coefficient.	2	2
11	Mid-Term Exam 2	1	
12	Statistical measures: mean, variance, standard deviation.	2	2
13	Random variable, probability density function, Cumulative function.	2	2
14	Software Applications : Excel-SPSS.	2	2
15	Final Exam	2	

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