

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing		Trimester III	
Sub: COMPUTER APPLICATIONS AND NUMERICAL TECHNIQUES		Code: 517 CSS 518 MAS	
Periods per week	Lecture*	5	
	Practical	3 Hrs.	
	Tutorial		
		Hours	Marks
Evaluation system	Theory Examination	3	100 (Scaled down to 50)
	Term work		50
*Each lecture of 1hr duration			
Objective: This will lay strong foundation for solving calculus problems of numerical methods using computer.			
Prerequisite	Computer Fundamentals, Computer Programming		
Detailed syllabus			
Unit	Topics		Duration (Hr)
1	Introduction to Spreadsheets: Understanding Workbooks and Worksheets, Editing Worksheet Data, Working with cells and ranges, Worksheet Formatting, Understanding Files and Templates, Working with Formulas and Functions, Creating charts and Graphics.		08
2	Introduction to Databases: Reaching the limits of spreadsheets, importing the spreadsheet idea into Access, Obtaining information using Queries, Relational Database Design, Different types of Access Queries, Designing Reports		09
3	Web-Site Design: HTML: Common Tags in HTML, Cascading Style Sheets, Frames, Form elements, DHTML, Introduction to Client Side Scripting.		09
4	Solution: of Algebraic and Transcendental Equations.		05
5	Curve fitting (including relevant engineering Problems): Interpolation – Newton's divided difference, language interpolating polynomials, Approximation; least square approximation, linear regression, and polynomial regression.		07
6	Numerical differentiation (including relevant engineering application): Methods based on interpolation and finite differences,		05
7	Numerical integration (including relevant engineering Problems): Taylor's method, Picard's method of successive approximation, Runge-Kutta methods, Euler's predictor-corrector Milne's method, Runge-Kutta methods of second and fourth order, boundary value and eigen-value problems.		07
TOTAL			50

Books:

John Walkenbach “Excel Bible”, Wiley publishing, Inc
Bernam V. Liengme, “A guide to Microsoft Excel 2003 for Scientists and Engineers”,
Butterworth Heinemann
Alex Homer, “The Beginners Guide to Access”, Wrox
Thomas A.Powell, “HTML: The complete Reference”, TMH
S.S.Sastry, “Introductory Methods of Numerical Analysis”, PHI
Chapra, Steven C. Canale, Raymond P.”Numerical Methods for Engineers”, TMH
Robert S. Schilling, Sandra Hasses “Applied Numerical Methods for
Engineers”(Using MATLABS and C), Thompson Learning Publications.
Balagurusamy, “Numerical Methods”, TMH.
Veer Rajan “Numerical Methods & Solutions.”

Internet references: As given by the Faculty

Term work: Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus. The 10 experiments should include 6 experiments on Numerical Techniques using Excel, 4 experiments on HTML.

Two class tests

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester - III	
Sub: Applied Mathematics - III			Code: 514 MAS	
Periods per week	Lecture*	5		
	Practical	-		
	Tutorial	-		
			Hours	Marks
Evaluation system	Theory Examination		3	100 (Scaled down to 50)
	Term work			50
*Each lecture of 1hr duration				
Objective: To provide an understanding of the basic concept of applied mathematics at post secondary level				
Prerequisite				
Detailed syllabus				
Unit	Topics			Duration (Hr)
1	<p>Matrices: Definition, transpose; addition, subtraction and multiplication of matrices, Types of matrices, adjoint of a matrix, determinant, inverse of a matrix, rank of a matrix, linear dependence and independence of rows and columns of a matrix over real field.</p> <p>Simultaneous equations: Three unknowns, consistency of a set of equations and its solution, Cramer's rule.</p> <p>Polynomial: Characteristic equation, characteristic roots and characteristic vectors of a square matrix.</p>			16
2	<p>Laplace transform, Definition, Laplace transform of, a constant, t, e^{-at}, $\sin at$, $\cos at$, $e^{-at} \sin a$ and, $e^{-at} \cos at$, evaluation of Inverse Laplace using partial fraction expansion (simple cases), Laplace transform of the derivatives of a function, solution of linear constant coefficient inhomogeneous differential equations using Laplace transforms.</p>			12
3	<p>Fourier Series: Orthogonality and orthonormal functions, Expression for a function in a series of orthogonal functions, Dirichlet's conditions, with period 2π, and $2l$ (Derivation of Fourier coefficients a_0, a_n, b_n is not expected) Dirichlet's theorem, Even and Odd functions. Half range sine and cosine expansions, Parseval's identities (without proof).</p>			10
4	<p>Random variables: Discrete and continuous random variables, probability mass function, and density probability distribution for random variables, expected value, variance, moments, and moment generating functions, relation between raw moments and central moments</p>			12
TOTAL				50

Books:

Reference books:

Advanced Engineering Mathematics- Erwin Kreyszig, (Wiley Eastern Ltd.)
Schaum's Outline Series- Mc Graw Hill Book Co.

Internet references: As given by the Faculty

Term work:

1. Minimum two class tests.
2. Assignments given by the faculty based on above syllabus

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester - III	
Sub: Engineering Mechanics			Code: 515 MAS	
Periods per week	Lecture*	5		
	Practical	3 Hrs		
	Tutorial		-	
			Hours	Marks
Evaluation system	Theory Examination		3	100 (Scaled down to 50)
	Term work			50
*Each lecture of 1hr duration				
Objective: Engineering Mechanics is a physical science, which is concerned with the study of resultant effect of action of forces on bodies, both in a state of rest and in motion. This subject is a basic course in engineering study of advance engineering subjects, like Mechanics of Deformable bodies, Mechanics of fluids, Structural Analysis, Theory of Machines and Robotics.				
Prerequisite	Knowledge of H.S.C level Physics			
Detailed Syllabus				
Unit	Topics			Duration (Hr)
	<u>STATICS</u>			
1	Coplanar Forces: <ul style="list-style-type: none"> System of forces, Moment of force, Varignon's Theorem, Resultant of – I. Concurrent Forces ii. Parallel Forces, iii. General force system. Equilibrium of coplanar forces, Condition of Equilibrium, Free Body diagrams, Types of supports and their reactions, Determination of support reactions, Lami's theorem. 			10
2	Frames and Trusses: <ul style="list-style-type: none"> Analysis of determinate pin-jointed frames. Analysis of determinate plane trusses by method of joints and method of sections 			6
3	Friction: <ul style="list-style-type: none"> Laws of friction, Angle of friction, Angle of repose, cone of friction. Applications to problems involving bodies on inclined plane, wedges, ladders and screw jack. 			6
4	Centroid and Moment of Inertia: <ul style="list-style-type: none"> Centroid of Centroid composite plane areas, Centroid of bent up wires. Moment of Inertia of composite plane areas, Parallel axis theorem, Perpendicular axis theorem, Radius of gyration. 			6

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	<u>DYNAMICS</u>	
5	Kinematics of Particles: <ul style="list-style-type: none">• Rectilinear motion, Uniform velocity, Uniform acceleration, Variable acceleration, Graphical analysis using motion curves.• Curvilinear motion, Rectangular system, Normal and Tangential components of acceleration, Projectile motion.• Relative motion.	10
6	Kinetics of Rigid Bodies: <ul style="list-style-type: none">• Types of rigid body motion, Translation motion, Rotation about fixed axis, General plane motion.• Instantaneous center method for bodies in General plane motion	4
7	Kinetics of Particles: <ul style="list-style-type: none">• Newton's second law of motion applied to particles in rectilinear and curvilinear motion, D'Almebert's principle.• Work done by force, Work energy principle, Principle of conservation of energy, Power & efficiency.• Linear momentum, Impulse, Application of Impulse Momentum Equation, Principle of conservation of momentum, Direct central impact, Oblique central impact.	8
TOTAL		50

Books:

Reference books:

- Engineering Mechanics – M. D. Dayal
- Engineering Mechanics – Beer and Johnston
- Engineering Mechanics – J. L. Meriam

Internet references: As given by the Faculty

Term work:

- Report on experiments performed (minimum five) based on syllabus
- Assignment consisting of numerical problems
- Minimum two written class test

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing		Trimester - III	
Sub: Instrumentation Fundamentals		Code: 516 EES	
Periods per week	Lecture*	5	
	Practical	3 Hrs.	
	Tutorial	-	
		Hours	Marks
Evaluation system	Theory Examination	3	100 (Scaled down to 50)
	Term work		50
*Each lecture of 1hr duration			
<p>Objective: Sensors and measurements form the basis of instrumentation branch of electronics engineering. Instrumentation is the backbone of all industrial development and at the end of this course, student becomes familiar with basics of most frequently used sensors and measurements techniques of physical quantities like temperature, pressure, flow, velocity, torque, humidity etc.</p>			
Prerequisite	Basic Electrical & Electronic Engineering		
Detailed syllabus			
Unit	Topics	Duration (Hr)	
1	Principles used in Instrumentation: -		
	(a) Basic behaviour of materials: - Linear expansion with stress and temperature, Volumetric changes, Resistance changes with temperature, Thermoelectric effects, effect of pressure, changes in materials because of light (photoelectric), piezo electric effect, Hall effect.	7	
	(b) Basic principles: - Bernoulli's principles, Force, torque flow calculation, Heat and heat transfer	5	
	(c) Measurement Principles: - Displacement, Speed linear & rotational, flow, Pressure level, weight, temperature	5	
	(d) Electrical Principles: - Galvanometer, Potentiometric Devices, Bridges	2	
2	Transducers: - (a) Mechanical: - Bellows, Metallic Diaphragm, Bourdon' spring, flow nozzles, orifice plate, pitot tube, rotameter, turbine type meters.	5	
	(b) Electrical: - Strain gauges, RTD's, Thermocouple, Pirani gauge, LVDT, magnetic flow meter	3	
	(c) Characteristics: - Speed response and accuracy span and range, repeatability.	3	
3	Measurements using Transducers for a given application: - Pressure, force, torque, velocity, flow, level, Ph, humidity & position	6	
4	Signal Conditioning: - Need for signal conditioning, Op-amps as inverting and non-inverting modes, integrators, differentiators, Instrumentation applications.	5	

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5	Converters & Transmitters: - Current to Voltage, Voltage to Current using o/ps of transducers, 4-20 mA source	5
6	Indicating & Recording Devices: - Introduction to D.C. & A.C. recorders, Data logging-A/D converters, counters.	4
Total		50

Books:

Reference books:

Fundamentals of Electrical & Electronic -B.L.Theraja

Modern Electronic Instrumentation and measurements techniques- Albert D. Helfrick,
William D. Cooper

Electronic Instrumentation –Curtis Johnson

Internet references: As given by the Faculty

Term work: The term work shall comprise of at least six laboratory experiments and assignments based on the whole syllabus, duly recorded and graded. Minimum two class tests

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester III	
Sub: Work Shop Practice			Code: 513 MES	
Periods per week	Lecture*	Nil		
	Practical	06 Hrs.		
	Tutorial	-		
			Hours	Marks
Evaluation system	Theory Examination		-	-
	Term work			100
*Each lecture of 1hr				
Objective: To impart training to help the students develop skill sets for creating entities from primitive engineering materials. This exercise also aims at inculcating respect for physical work and hard labour in addition to some amount of value addition by getting exposed to inter disciplinary engineering domains.				
Prerequisite				
Detailed syllabus				
Unit	Topics			Duration (Hr)
1	Fitting (compulsory): Use and setting of fitting tools for chipping, cutting, filing, Marking, centre punching, drilling, tapping.			12
2	Carpentry (compulsory): Use the setting of hand tools likes handsaws, jack planes, chisels and gauges for construction of various joints, wood turning, modern wood turning methods.			12
3	Welding & Sheet Metal Fabrication: Edge preparation for welding jobs. Arc welding for different jobs like; lap welding of two plates, butt-welding of plates with cover plates, welding to join plates at right angles, etc. Spot welding, Brazing and Soldering. Use of hand tools for sheet metal fabrication. Sheet metal fabrication of jobs involving cutting, shearing, bending, edge folding, soldering, brazing etc.			12
4	Machine shop (Conventional &CNC): At least one turning job is to be demonstrated on a conventional lathe as well as on a CNC lathe.			08
5	PCB Laboratory Exercises: Layout drawing, +ve and -ve film making, PCB etching and drilling, tinning and soldering techniques.			08
6	Plumbing: Various fittings/joints used in plumbing work. Use of hand tools in plumbing. Preparation of pipe joint assembly involving various pipefittings.			08
Total				60

Books:

Reference books: As given by the Faculty

Internet references: As given by the Faculty

Term work:

1. **Fitting:** One job-involving Fitting to size, one simple male-female joint.
2. **Carpentry:** One workshop practice carpentry job involving a joint and a report on demonstration of a job involving woodturning.