

SVKM's NMIMS (University)

Mukesh Patel School of Technology Management & Engineering

MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester II	
Sub: Applied Mathematics - II			Code: 509 MAS	
Periods per week	Lecture*	6		
	Practical	-		
	Tutorial	-		
			Hours	Marks
Evaluation System	Theory Examination	3		100(Scaled down to 50)
	Term work			50
*Each lecture of 1 Hr.				
Objective: To provide an understanding of the basic concept of Applied Mathematics at post secondary level				
Prerequisite	To provide an understanding of the basic concept of Applied Mathematics at post secondary level			
<u>DETAILED SYLLABUS</u>				
Unit	Topics			Duration (Hr)
1	Hyperbolic functions: Complex numbers and De Moivre's theorem, roots of unity, Log z, Sinh Z, Cosh Z; graphs, identities, derivatives and integrals; catenary (hanging cable); inverse hyperbolic functions			08
2	Double and Triple integrals: Set up and change of order; centre of mass and moments of inertia; radius of gyration; polar coordinates using the Jacobian; triple integrals in rectangular and spherical coordinates; application of double and triple integral to area, mass, volume and centroid.			12
3	Beta and Gamma functions: Definitions; relation between beta and gamma functions; duplication formula; evaluation of integrals.			12
4	Differential Equations: First order and first degree exact differential equation and those which can be reduced to exact by use of integrating factor (only four rules of IF and IF by inspection), Linear differential equation and equation reducible to linear equation, Linear differential equation of higher order with constant coefficients. Complementary functions. Particular integrals for the equation of the type $f(D)y = X$ where $X = e^{ax}$, x^m , $\sin(ax + b)$, $\cos(ax + b)$, $e^{ax}V$, $x.V$ where V is a function of x (Derivations of PI are not expected), Cauchy's linear homogenous equation and Legendre differential equation. Variation of parameter methods and method of undetermined coefficients. LRC circuit equation and its solution			18
5	Standard curves: Straight line, circle, parabola, ellipse, hyperbola, regular hyperbola			10
TOTAL				60

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BOOKS:

Reference books:

- Advanced Engineering Mathematics: Erwin Kreyszig, Wiley Eastern Schaum Outline Series: McGraw Hill Book Co.

Internet references: nil

Term work:

- Minimum two assignments given by the faculty
- Two Team tests of which best will be considered

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MBA (Tech) IT, Telecommunication, Chemical, Manufacturing		Trimester II	
Sub: Applied Science - II - Applied Chemistry - II		Code: 508 CHS	
Periods per week	Lecture*	2.5	
	Practical	1.5 Hrs	
	Tutorial	-	
		Hours	Marks
Evaluation System	Theory Examination	1.5	50 (scaled down to 25)
	Term work		25
*Each lecture of 1 Hr.			
Objective: To understand and explain the applications of core chemistry to the materials. To understand the gravity of the problem of corrosion w. r. t. maintenance of the machines in the industry.			
Prerequisite: Knowledge of electrochemical reactions. Properties of the metals. Knowledge of conventional fuels.			
<u>DETAILED SYLLABUS</u>			
Unit	Topics		Duration (Hr)
1	Fuels: classification of fuels, bomb calorimeter, solid fuels, liquid fuels, cracking, octane no., gaseous fuels.		06
2	Corrosion: types of corrosion, factors influencing corrosion, corrosion control		06
3	Alloys: Principal of alloying, types of alloys		02
4	Protective coating: metallic coating, organic coating		05
5	Electrochemistry: electrochemical cell, EMF, Nernst theory, batteries- primary and secondary.		06
TOTAL			25

Books:

Reference books:

Engineering chemistry – B.K.Sharma
 Applied Science – II - Dr. Mrs. J.A.Parikh (Nandu hi Publications)

References:

Engineering Chemistry – Jain & Jain, Dhanpat Rai & sons
 Numerical problem in Chemistry - R.N.Sarin
 Chemistry of Engineering Materials – Robert B. Ligeou

Internet references: www.chemweb.com

Term work:

- Experiments based on above syllabus. Minimum 5 experiment based on above syllabus.
- Assignment given by Faculty. Minimum 2 assignments given by the faculty
- Two class tests of which best will be considered

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MBA (Tech) IT, Telecommunication, Chemical, Manufacturing		Trimester II	
Sub: Applied Science - II - Applied Physics - II		Code: 507 PHS	
Periods per week	Lecture*	2.5	
	Practical	1.5 Hrs	
	Tutorial		-
		Hours	Marks
Evaluation System	Theory Examination	1.5	50 (scaled down to 25)
	Term work		25
*Each lecture of 1 Hr.			
Objective: To enable students to understand the basic principles of advanced physics theory and practice To prepare students with necessary foundation for further studies in electronics, Applied Physics etc.			
Prerequisite	Knowledge of HSC level Physics		
<u>DETAILED SYLLABUS</u>			
Unit	Topics	Duration (Hr)	
1	Optics: Analytical treatment of interference, intensity distribution of fringe system, coherent and non-coherent sources, interference in thin film in reflected and transmitted system, wedge shaped film, Newton's rings and applications. Diffraction: Fraunhotter's diffraction at single slit, double slit, N Parallel slits, (Mathematical deviation not expected), diffraction grating, resolving power of grating, dispersive power of grating.	7	
2	X-Ray: X-Rays origin and characteristic of X-Ray, properties of X-Rays, Mosseley's law, X-Ray diffraction, Bragg's law, Bragg's X-Ray Spectrometer and determination of crystal structure.	5	
3	LASER: Spontaneous and stimulated emission population inversion, pumping device and active device. Lasing action, Ruby Laser, He-Ne Laser, CO ₂ Laser, Semiconductor Laser. Applications of laser & application of laser in holography	5	
4	Fiber Optics: Total internal reflection, principle and working of optical fibers, different types of optical fibers, modes of propagation in fiber, multimode and monomode fibers.	4	
5	Super-conductors: Theoretical Explanation of super conductors: BCS Theory, Meissner effect, Type-I & Type-II Superconductors, properties and uses of superconductors.	4	
TOTAL			25

Books:

Reference books:

- 1) Jenkins and White "Optics" MC Graw Hill
- 2) A.K. Ghatak "Optic"
- 3) A.K. Ghatak & Thyagarajan "LASER" Theory and application..

- 4) Agrawal, Fiber Optics Communication.
- 5) Engineering Physics – A.S. Vasudeva.

Internet references: www.orcad.com

Term Work:

- A: Part on experiments performed (at least 5) based on syllabus.
- (ii) Assignment consisting of numerical problems (at least 20)
- B: Two written test during term.

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MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester II	
Sub: Basic Electronics			Code: 511 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 1 Hr.				
Objective: Electronics engineering deals with semiconductor devices handling currents, voltages and powers of much smaller magnitudes (Few volts, few hundred milli-amperes and few watts) and today's major technological break through in telecommunication, computers work with electronic devices.)It is the aim of this course to introduce, the basic electronic devices, their working principles, constructional details and their utilizes in few known electronic systems like amplifiers.				
Prerequisite	Knowledge of HSC level Physics			
Detailed syllabus				
Unit	Topics			Duration (Hr)
1	Semiconductor-Energy bands, PN junction diode, type of different diode & their characteristics, users.			4
2	Rectifies circuits, Basic filters, voltage regulators (using zener diode)			10
3	Trnsistors: Static characteristics, constructional details of BJT, FET & UJT etc.			12
4	Photo devices: construction, characteristics & users of photo devices such as phototransistors, LEDs, LCDs etc			6
5	Thyristors-Basic principles of conduction, static Characteristics, DIAC, TRIAC & applications			6
6	Amplifiers: Amplifier concept, Introduction to feedback, different configurations-CE, CB, CC, RC Coupled & Transistors coupled amplifier. Introduction of Power amplifier.			12
TOTAL				50

Books:

Reference books:

Electronic Devices & Circuits Theory-R.L.Boylestad & L Nashelsly
 Electronic Devices & Circuits – Allen Motorshed
 Basic Electronic-Bernad Grob,Tata Mc Graw Hill Company
 Basic Electronic-B.L.Theraja

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Internet references: As given by the Faculty

Term work:

- The term work shall comprise of at least six laboratory experiments and minimum two assignments based on the whole syllabus, duly recorded and graded.
- Minimum two class tests of which best will be considered.

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MBA (Tech) IT, Telecommunication, Chemical, Manufacturing			Trimester II	
Sub: Computer Programming			Code: 512 CSS	
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 1 Hr.				
Objective: This course consists of fundamentals of Object Oriented Programming. The basic idea of Object Oriented Concepts like Abstraction, Encapsulation, Polymorphism, Inheritance and Data Hiding are covered. The objective of the course is to implement the various concepts through the Object Oriented Language 'C++' which is the basic need for learning the various techniques to be covered in the further semesters.				
Prerequisite	Knowledge of Trimester I level Computer Fundamentals			
<u>DETAILED SYLLABUS</u>				
Unit	Topics			Duration (Hr)
1	C++ Fundamentals: Data types, operators, Preprocessor directives, Declarations, Input & Output, Manipulators (endl,setw(), setprecision()), Control structures, functions and arrays.			05
2	Objects and classes: Data hiding and encapsulation, Private and public members, Member functions, Accessing class members, Objects as function parameters, static data & member functions, friend functions & friend classes.			9
3	Object Initialization & Cleanup: Constructors, Parameterised constructors, Destructor, Constructor overloading, Constructors with default arguments, Constructors with dynamic operations.			06
4	Function & Operator Overloading: Function overloading, functions with default arguments, inline functions, unary operator overloading, binary operator overloading, overloading arithmetic, relational & assignment operators			07
5	Inheritance: Derived & base class, protected members, Overriding functions. Private, protected & public inheritance, derived class constructors, levels of inheritance & multiple inheritance			06
6	Pointers: Void pointers, Pointer to functions & objects, this pointer, Pointers & memory management, new & delete operators, Dynamic memory allocation, creating one & two			05

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	dimensional arrays with dynamic memory allocation.	
7	Virtual Functions & Polymorphism: Need for virtual functions, Pointer to derived class object, Pure virtual functions, Abstract classes, Dynamic or late binding.	04
8	File Handling Introduction: Files & streams, Opening & closing a file, Input and output, Classes and files.	04
9	Templates: Function templates & class templates.	04
TOTAL		50

Books:

Reference books:

Balaguruswamy, "Programming in C++", TMH

Robert Lafore, "Object Oriented Programming in turbo C++", Galgotia

Herbert Schildt, "Complete Reference", TMH

Y.Kanetkar, "Let us C++", BPB

Internet references: Nil

Term work:

- Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus. Two class tests will be conducted during course of which best will be considered.

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MBA (Tech) IT, Telecommunication, Chemical, Manufacturing		Trimester II	
Sub: Material Science		Code: 510 MMS	
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: To enable an understanding of engineering materials their structures, properties and performance. To enable an understanding of the criteria for selection of engineering materials for different applications.			
Prerequisite	Higher Secondary level Physics		
<u>DETAILED SYLLABUS</u>			
Unit	Topics	Duration (Hr)	
1	Crystal structure: Classification of crystal structure, unit cell, co-ordination number, atomic packing factor. Single crystal and polycrystals. Deformation in single and polycrystalline materials.	4	
2	Crystal Imperfections & Deformation: Point defects : Vacancy, Interstitialty, Impurity atoms, their formation and effects. Dislocation: Edge and Screw dislocations, their significance Surface defects, Grain boundary, sub-angle grain boundary, stacking fault, their significance. Deformation: Elastic & Plastic deformations and their significance	6	
3	Metals & Alloys: Formation of solids from liquid of pure metals and alloys. Ingot defects and their remedies. Classification of alloys: Eutectic, Eutectoid & peritectic alloys, conditions of their formation and importance. Solid solutions (conditions and importance of their formation). Effects of alloying elements Minor alloying elements Major alloying elements	8	
4	Principles of heat and surface treatments: Equilibrium transformations in Iron-Iron carbide systems. Non-equilibrium transformation Mechanisms of pearlite, bainite and martensite transformations Principle of heat treatment of steels from T.T.T. diagram Significance of austenization, homogenization and controlled decomposition of austenite Heat treatment furnaces, salt baths and cooling media. Heat treatment in controlled atmosphere Basics of Hardening- (case & full) Annealing & Normalizing	12	

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	Basics of Surface Treatments like electroplating, anodizing, Surface Coatings etc.. Joining: Welding, Brazing & Soldering (briefly)	
5	Polymeric & Composite Materials – Classification, Types, Properties & Applications. Introductions to Additives for Polymers. Introduction to Polymer composites, Blends & Alloys. Simple method of identification of Polymeric materials Introduction to ceramic & composite materials	10
6	Properties, Testing & Selection of Materials: Introduction and Classification of Materials. Basics of Properties of Materials (Physical , Mechanical, Electrical, Chemical, Thermal etc.). Testing of Materials for Mechanical, Physical, Electrical, and Thermal etc. Basics of Non Destructive testing techniques for flaw detection. Important alloys: Alloy steels, tool steels, stainless steels. aluminium copper, nickel, tin and zinc, their specification and application. Selection of Materials for industrial applications	10
TOTAL		50

Reference books:

A text Book of Material and Metallurgy – Dr. O. P. Khanna
 Engineering Physics – A. S. Vasudeva
 Physical Metallurgy – Y. Lakhtin
 Introduction to Engineering Materials – NIIT, Phi, Pvt. Ltd., New Delhi
 Mechanical Metallurgy – George Dieter
 Physical Metallurgy - Sydney Avner, Tata McGraw Hill

Internet references: www. asm international – Website – USA

Term work:

Practicals based on Syllabus.
 Minimum two-class test
 Any assignment given by the Faculty