

# SVKM's NMIMS University

## Mukesh Patel School of Technology Management & Engineering

<b>B.Tech. (All Branches)</b>			<b>First Year - Trimester - III</b>	
<b>Sub: Applied Mathematics - III</b>			<b>Code : AM-III</b>	
<b>Periods per week</b>	Lecture	4 hrs.		
	Practical			
	Tutorial	2 hrs.		
			<b>Hours</b>	<b>Marks</b>
<b>Evaluation system</b>	<b>Theory Examination</b>		<b>3</b>	<b>50</b> (100 scaled down to 50)
	<b>Tests</b>			<b>20</b>
	<b>Term Work</b>			<b>30</b>
<b>Objective:</b> To provide an understanding of the basic concept of applied mathematics at post secondary level				
<b>Detailed syllabus</b>				
<b>Unit</b>	<b>Topics</b>			<b>Duration (Hr)</b>
1	<p><b>Matrices:</b> 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><b>Simultaneous equations:</b> Three unknowns, consistency of a set of equations and its solution, Cramer's rule.</p> <p><b>Polynomial:</b> Characteristic equation, characteristic roots and characteristic vectors of a square matrix.</p>			12
2	<p><b>Laplace transform,</b> Definition, Laplace transform of, a constant, <math>t</math>, <math>e^{-at}</math>, <math>\sin at</math>, <math>\cos at</math>, <math>e^{-at} \sin a</math> and, <math>e^{-at} \cos at</math>, 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>			10
3	<p><b>Fourier Series:</b> Orthogonality and orthonormal functions, Expression for a function in a series of orthogonal functions, Dirichlet's conditions, with period <math>2\pi</math>, and <math>2l</math> (Derivation of Fourier coefficients <math>a_0</math>, <math>a_n</math>, <math>b_n</math> is not expected) Dirichlet's theorem, Even and Odd functions. Half range sine and cosine expansions, Parseval's identities (without proof).</p>			8

4	<b>Random variables:</b> 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	10
<b>TOTAL</b>		<b>40</b>

**Books:**

**Reference books :**

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

**Internet references:** As given by the Faculty

**Term work:**

Minimum two class tests.

Assignments given by the faculty based on above syllabus

.....

## SVKM's NMIMS University

### Mukesh Patel School of Technology Management & Engineering

<b>B. Tech. (All Branches)</b>		<b>Trimester - III</b>	
<b>Sub: Communication Skills</b>		<b>Code : CS</b>	
Periods per week	Lecture	2 Hrs.	
	Practical	-	
	Tutorial	2 Hrs.	
		Hours	Marks
Evaluation system	Theory Examination	3	100 (Scaled down to 50)
	Term work		50
<b>Objective</b>	Understanding of Communication process, principles and effective techniques. Acquiring the skills of Oral and Written Communication in a business environment.		
<b>Detailed syllabus</b>			
<b>Unit</b>	<b>Topics</b>	<b>Hours</b>	
1.	<b>Communication Theory :</b> a) Process of Communication, Barriers to Communication, Methods and Media of Communication. b) Organizational Communication and Objectives of Communication. c) <b>Forms of Communication :</b> Oral and Written, Formal and Informal, Intra-personal and Interpersonal, Group, Public and Mass Communication.	7	
2.	<b>Oral Communication :</b> a) Non-verbal Communication and body language; Listening; Business Etiquette. b) Presentation Skills c) Group Discussions; Interview; Meetings	6	
3.	<b>Written Communication:</b> a) Essentials of Written Communication; Formats and Layout of Letters, b) Letters, Technical Reports, Précis writing and Meeting Documentation	7	
	<b>Total</b>	<b>20</b>	

#### **Term Work :**

Mock Interviews, Presentations, Group Discussions, Exercises relating to Letter Writing, Report Writing, Précis Writing, Meeting Notice, Agenda and Drafting Resolutions, Two Assignments - Report writing and Précis writing.

**Tests :**

At least 2 written test shall be given during the trimester.

**Books:**

R.C. Sharma and Krishna Mohan : Business Correspondence and Report Writing, Tata McGraw Hill Publication.

Lesikar and Petit : Report Writing for Business, Tata Mc.Graw Hill Publications.

Rai & Rai : Business Communication for Engineering Students, Himalaya Publishing House, 2006.

Diana Boeher – Communicate with Confidence, Tata McGraw Hill.

Internet references: As given by the faculty

# SVKM's NMIMS University

## Mukesh Patel School of Technology Management & Engineering

<b>B.TECH. (ALL BRANCHES)</b>		<b>Trimester III</b>	
<b>Sub : APPLIED SCIENCE – II</b>			
<b>APPLIED PHYSICS – II</b>			
Periods per week	Lecture	2 Hrs.	
	Practical	2 Hrs. / Fortnight	
	Tutorial	-	
		<b>Hours</b>	<b>Marks</b>
Evaluation system	Theory Examination	<b>3</b>	<b>50</b> (100 scaled down to 25)
	Test		<b>10</b>
	Term Work / Oral / Practical		<b>15</b>
<b>Objective:</b>			
To develop understanding of the fundamentals of the subject and develop the ability to use it for various Engineering applications. To expose the students to relevant topics in the subject of Physics.			
Prerequisite			
<b>Detailed Syllabus</b>			
<b>Unit</b>	<b>Topics</b>	<b>Duration (Hr)</b>	
1.	<b>Optics:</b> 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. Non-reflecting films, totally reflecting films. <b>Diffraction:</b> 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.	<b>5</b>	
2.	<b>X-Ray:</b> 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	<b>4</b>	
3.	<b>LASER:</b> Spontaneous and stimulated emission population inversion, pumping device and active device. Lasing action, Ruby Laser, He-Ne Laser, CO <sub>2</sub> Laser, Semiconductor Laser. Applications of laser & application of laser in holography	<b>4</b>	
4.	<b>Fiber Optics:</b> Total internal reflection, principle and working of optical fibers, different types of optical fibers, modes of propagation in fiber, multimode and monomode fibers.	<b>3</b>	

5.	<b>Super-conductors:</b> Theoretical Explanation of super conductors: BCS Theory, Meissner effect, Type-I & Type-II Superconductors, properties and uses of superconductors.	4
----	--	---

**Term Work:**

- (A) (i) Report on experiments performed (at least 5) based on syllabus.
- (ii) Assignment consisting of numerical problems (at least 20) **15 marks**
- (B) Two written test during term. **10 marks**

**Recommended 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.

.....

# SVKM's NMIMS University

## Mukesh Patel School of Technology Management & Engineering

<b>B.TECH. (ALL BRANCHES)</b>		<b>Trimester III</b>	
<b>Sub : APPLIED SCIENCE – II</b> APPLIED CHEMISTRY-II (SECTION II)			
Periods per week	Lecture	2 Hrs.	
	Practical	2 Hrs. / Fortnight	
	Tutorial	-	
		<b>Hours</b>	<b>Marks</b>
Evaluation system	Theory Examination	<b>3</b>	<b>50</b> (100 scaled down to 25)
	Test		<b>10</b>
	Term Work / Oral / Practical		<b>15</b>
<b>Detailed Syllabus</b>			
<b>Unit</b>	<b>Topics</b>	<b>Duration (Hr)</b>	
1.	<p><b><u>UNIT I : CORROSION :</u></b></p> <p>Introduction, Dry or Chemical corrosion, Wet or Electro chemical corrosion (Mechanism), concentration cell corrosion, Types of corrosion, galvanic corrosion, water corrosion, soil corrosion, pitting corrosion, intergranular corrosion, microbiological corrosion, Stress corrosion. Factors influencing rate of corrosion, Corrosion control.</p> <p><b>Protective coatings: (a) metallic coatings – Methods of application, advantages and disadvantages, (b)organic coatings/ Formulation, functions of constituents of paints, varnishes, lacquers, enamels )</b></p>	6	
2.	<p><b><u>UNIT II : ALLOYS :</u></b></p> <p>Definition, Principle of alloying, purpose of manufacturing alloy, Ferrous alloys - plain Carbon steel, alloy steels, composition properties and application of stainless steel, special steels, Non ferrous alloys - Copper alloys- Brass, composition properties and uses of commercial brass, German silver, Bronze - composition properties and uses of gun metal, Al-bronze, Ni bronze, Comparison between Brass and bronze. Aluminum alloys composition properties and uses of Magnalumin, Duralumin, Electron,. Nickel alloys - composition properties and uses of Nichrome, Monel metal, Constantan. Lead alloys - composition properties and uses of Soft solders, Tinmans solders.</p>	3	
3.	<p><b><u>UNIT III : FUELS :</u></b></p> <p><b>Definition, classification of fuels, comparison between solid ,liquid and gaseous fuels , calorific value and its units. Determination of calorific value-Bombs calorimeter, numericals.</b></p>	6	

	<p>Solid fuels: <b>Coal, classification of coal, proximate and ultimate analysis, numerical based on analysis of coal. ( Dulong formula ).</b></p> <p>Liquid fuels : <b>origin of petroleum, composition of petroleum, refining of petroleum (names of constituents, boiling range, composition and industrial application),</b></p> <p>Cracking. Knocking in petrol engine and diesel engines. Octane number cetane number, synthetic petrol. Power alcohol Gaseous fuel: Composition , properties and application of coal gas , LPG, natural gas. Combustion: calculation on air and oxygen requirement .</p>	
4.	<p><b><u>UNIT IV: ELECTROCHEMISTRY:</u></b></p> <p>Introduction, Electro chemical cell or galvanic cell, Cell EMF and concentration, Redox reactions and their spontaneity, Nernst theory, concentration cell, reversible and irreversible cell, Electrochemical and galvanic series, Energy storage and its need.</p> <p>Batteries : Introduction, Types of batteries, chemistry involved in the functioning of battery, Definations of important terms – energy density, power density, charge-discharge cycles. Types, composition, working and applications of primary, secondary and hydrogen-oxygen fuel batteries.</p>	5-

**TERMWORK** : T/W should consists of following

- 1) Four assignments,
- 2) One class test
- 3) Minimum Five experiments out of:
  - a) Estimation of iron in plain carbon steel
  - b) Estimation of copper in brass iodometrically.
  - c) Estimation of zinc in brass by complexometry.
  - d) Estimation of Nickel in steel by complexometry.
  - e) Estimation of moisture content in coal.
  - f) Study of corrosion of metal in medium of different pH..
  - g) Study of charging of Lead Acetate battery by measuring density of sulphuric acid electrolyte.

**Books Recommended :**

- 1 Engineering Chemistry , Jain and Jain Dhanpat Rai Publishing Company).
- 2 Fundamentals of Engineering Chemistry - Theory and Practice S.K.Singh, New Age International Publishers.
- 3 Applied Science – II, Dr. (Mrs.) J.A.Parikh ,Nandu publishers and printers Pvt. Ltd.
- 4 Engineering Materials, Venneth G. Budinski , Prentice-Hall (I) publications.

**SVKM's  
NMIMS University**

**Mukesh Patel School of Technology Management & Engineering**

<b>B.Tech. (All Branches)</b>		<b>Trimester - III</b>	
<b>SUB: Electrical Measuring Instruments &amp; Machines</b>		<b>Code : EMIM (Revised 2008-09)</b>	
<b>Periods per week</b>	Lecture	4 Hrs.	
	Practical	2 Hrs.	
	Tutorial	-	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>3</b>	<b>50</b> (100 scaled down to 50)
	Test		<b>20</b>
	<b>Term Work/Oral/ Pr.</b>		<b>30</b>
<b>Objective:</b> To familiarize the student with the construction, working and application of electrical machines and measuring instruments, which are widely used in Laboratories and Industry.			
<b>Prerequisite :</b> BEE			
<b>Detailed Syllabus</b>			
<b>Unit</b>	<b>Topics</b>	<b>Duration (Hr)</b>	
<b>1</b>	<b>Measuring Instruments:</b> A generalized Measurement System Configuration, Performance Characteristics of Measuring Instruments, Static Characteristics – Accuracy, Error, Precision, Repeatability, Reproducibility, Reliability, Linearity, Sensitivity and Resolution. Dynamic Characteristics. Review Principle of Ammeters & Voltmeters, Wattmeter, Energy meter, Electrostatic Instruments, Rectifier type Instruments, Extension of Ranges of Voltmeters and Ammeters, Principle of Frequency meter. Use of Current & Potential Transformers.	<b>08</b>	
<b>2</b>	<b>Measurement of R, L, and C:</b> Measurement of low, medium & high resistances – Wheatstone & Kelvin's bridge, Ohmmeter, Megger. A. C. bridge circuits for measurement of inductance & capacitance – Maxwell's, Hay's & Anderson bridge, Schering bridge, D. C. & A. C. Potentiometers.	<b>08</b>	
<b>3</b>	<b>Electrical Frequency Meters</b>	<b>02</b>	

<b>4</b>	<b>Three Phase Induction Motors:</b> Rotating magnetic field, construction & principle of operation, slip, rotor frequency, development of equivalent circuit, torque equation, maximum torque, torque – speed characteristics, speed control. Starting methods, motor ratings and applications.	<b>06</b>
<b>5</b>	<b>Stepper Motor:</b> Principle of working, characteristics & applications. Simple Electronic control	<b>04</b>
<b>6</b>	<b>Transducers:</b> Principles, Classification and Requirements. Displacement – Potentiometric, LV.D.T, Variable Capacitance transducer. Strain - Types of Strain gauge, theory of operation of resistance strain gauge transducer, gauge factor, Load cell. Temperature - Temperature measurement by Thermistor, RTD & Thermocouples. Flow - Electromagnetic type flow meter. Photo Electric Transducer - Semiconductor photo diode, LDR, photo transistor. Piezo- electric transducer.	<b>12</b>

### Books:

#### Text Books:

1. Golding, Electrical Measurements & Measuring Instruments, Wheeler Publishing, fifth edition, 1994.
2. Sawhney A. K., A Course in Electrical & Electronic Measurements & Instrumentation, Dhanpatrai and Sons, 1993.
3. Nagrath & Kothari, Electrical Machines, Tata McGraw Hill, Second Edition, 1997.
4. Srinivasan M. P. Stepping Motors, CEDT: Indian Institute of Science, 1985.
5. Doebelin E .0., Measurement systems - Applications and Design, Fourth edition, Tata McGraw Hill, fourth edition, 1990.

#### Term work:

The term work shall consist of at least eight laboratory experiments covering the whole of syllabus, duly recorded and graded. Minimum two tests.

# SVKM's NMIMS University

## Mukesh Patel School of Technology Management & Engineering

<b>B.Tech. (All Branches)</b>		<b>Trimester III</b>	
<b>Sub : Computer Applications</b>		<b>Code : CA</b>	
Periods per week	Lecture	<b>4 hrs.</b>	
	Practical	<b>2 Hrs</b>	
	Tutorial	-	
		<b>Hours</b>	<b>Marks</b>
Evaluation system	<b>Theory Examination</b>	<b>3</b>	<b>50</b> (100 scaled down to 50)
	<b>Test</b>		<b>20</b>
	<b>Term Work</b>		<b>30</b>
<b>Objective:</b> The objective of this course is to give an Introduction to the Basic Data Structures, which will help students of all fields to better design and implement programs. A basic understanding of database and GUI concepts that will help students to develop independent application in respective fields.			
Prerequisite: C Programming Language			
<b>Detailed Syllabus</b>			
<b>Unit</b>	<b>Topics</b>	<b>Hours</b>	
<b>1</b>	<b>Introduction to Data Structures</b> Arrays, Records and Pointers: Multidimensional Arrays, Pointer Arrays, Record Structures.	<b>2</b>	
<b>2</b>	<b>Linked Lists</b> Introduction, Representation of Link Lists in Memory, Traversing a Linked List, Searching a Linked List, Insertion and Deletion, Header Link List	<b>5</b>	
<b>3</b>	<b>Stacks, Queues</b> Introduction, Stacks, Arithmetic Expressions, Polish Notation, Queues, Deques, Priority Queues	<b>3</b>	
<b>4</b>	<b>Trees</b> Introduction, Binary Trees, Traversing Binary Trees, Searching, Inserting and Deleting in a Binary Search Tree.	<b>5</b>	
<b>5</b>	<b>Introduction to Database Systems</b> Data Models, Data Languages, Transaction Management, Storage Management, Database Administrator, Database Users	<b>5</b>	
<b>6</b>	<b>E-R Model and Relational Database Design</b> Basic Concepts, Design Issues, Keys, E-R Diagram, Normalization	<b>5</b>	

<b>7</b>	<b>Introduction to GUI</b> Overview of Developing a GUI based Application, Steps in Building a GUI	<b>5</b>
<b>8</b>	<b>Organization Information via Controls</b> Toolbox: Text Boxes, Labels, Message Boxes, Image Controls, Rich Text Boxes, List and Combo boxes, Flexgrid Control.	<b>5</b>
<b>9</b>	<b>Tools and Techniques for Testing, Debugging</b> Testing, Bugs, Immediate Window, Debugging Tools	<b>5</b>

## **BOOKS**

### **Reference Books:**

1. Gary Cornell, "Visual Basic 6 from Ground UP", TMH
2. A.Silberschatz, H.F.Korth, "Database System Concepts", McGraw Hill
3. S. Lipschutz, "Data Structures", McGraw Hill

### **Internet references: as given by the faculty**

### **Term work consists of the following :**

1. Minimum 7 practical experiments covering all the topics.
2. Two term test papers.
3. Minimum two assignments.

.....