NORTH MAHARASHTRA UNIVERSITY, JALGAON (M.S.)

Teacher and Examiner's Manual

First Year Engineering

(Common to all branches)

Faculty of Engineering and Technology

SEMESTER-I

W.E.F 2012 – 2013

Engineering Physics - I

Teacher, Paper setter and Examiners should follow the guidelines as given below.

Unit - I

Teacher should facilitate learning of Environmental Science (Non- conventional and Conventional Energy Sources. Importance and Utilization methods for these sources.)

Environmental Science		Lecture required	Reference No.
A	**Introduction:** - List the all types of different Energy sources. Allow students to list these sources under Conventional & Non- Conventional type. Give brief information about potential of these energies in India. Explain the major distinguishing points between Conventional & Non -Conventional energy sources.	02	13
B	**Non-conventional energy sources** Solar cell- (Principle- Construction- Working & Characteristics),Merits & De-merits of Solar cell, Applications of Solar cell, Numerical	01	05,13
C	**Wind energy-** Explanation how solar energy causes, blowing of wind, Harnessing of Wind energy - Wind Mill, Diagram, Working, Merits and Demerits.	01	13
D	Biogas & Bio Mass (Brief Explanation about way of harnessing or utilization, advantages) , Advantages of non-conventional energy source.	01	13
E	**conventional energy sources-** Introduction to Nuclear energy brief explanation of Nuclear Fission ,Nuclear Fusion, Chain Reaction, Multiplication Factor	01	01
F	Definition of Nuclear reactor. Types of reactor- Homogeneous & Heterogeneous (Only Definition) Diagram of Heterogeneous Nuclear reactor. List essential parts. Working of these parts in brief, Numericals.	02	01
Guidelines for the examiner and paper setter. 1) Question should not be asked on introductory part. 2) Brief explanation of Homogeneous nuclear reactor should not be asked.			

Unit - II

Teacher should facilitate learning of Basics of **Laser& Fiber Optics**

		Laser & Fiber Optics	Lecture required	Reference No.
A		**Laser**		
	A	**Introduction** Laser beam characteristics -Coherence, Directionality, Intensity, Mono chromaticity.	01	7,1
	B	**Mechanism of Laser-** Stimulated absorption, Spontaneous emission, Stimulated emission. Laser Terminology- Active Medium, Population, Population Inversion, Pumping , Metastable State.	01	7,1
	C	**Types of Laser-** Gas Laser (He-Ne Laser), Nd-Yag Laser, Applications of Laser	02	7,1
	D	**Holography –** Introduction, Principle of Holography, Recording of 3 D Image using Hologram, Reconstruction of 3 D images, and Comparison with ordinary photography.	01	7,1
B		**Fiber optics**		
	A	Structure of optical fiber. Principle of optical fiber. Optical fiber Materials.	01	7,11
	B	**Propagation Mechanism in optical fiber-** Angle of acceptance, Numerical aperture, Critical angle. (Numerical)	01	7,11
	C	Optical fiber communication system (Only Diagram) Advantages of optical fiber. Applications of optical fiber.	01	7,11
Guidelines for the examiner and paper setter. 1) Numerical question should not be asked on Laser. 2) Working of Ruby laser should not be asked.				

Unit – III

Teacher should facilitate learning of Basic of Crystal structures & Crystal Formation. Teacher should facilitate learning of production & applications of X-ray.

		Crystallography & X-ray	Lecture required	Reference No.
A		**Crystallography**		
	a	**Introduction** Space Lattice – Translation Vectors The Basis and crystal structure.	01	6,1
	b	Unit cell & Lattice parameters, Bravais Lattices The cubic crystal- The simple Cube (SC), Body centered Cube (BCC).	01	6,1
	c	**Important Parameters of cubic lattice –**Number of atom per unit cell, Coordination Number, Atomic Radius. Packing density OR Packing Factor. Calculation of Lattice Constant. (Numerical)	01	6,1
	d	**Miller indices –** Rules for finding Miller Indices, Important features of Miller Indices, Miller Indices for cube crystal (Numerical)	02	6,1
B		**X-Rays-**		
	a	Production of X –rays (Coolidge tube) Continuous x – rays (With Derivation) and characteristic x – rays,	02	1,12
	b	Bragg's law. Properties & Applications of X-ray (Numerical- on Continuous X-ray derivation)	01	1,12
Guidelines for the examiner and paper setter.				

1) Question should not be asked for face centered cube (FCC) and on hexagonal closed pack (HCP)

2) Numerical on lattice constant should be included.

Unit – IV

Teacher should facilitate learning of Physics of Semiconductor

Physics of Semiconductor		Lecture required	Reference No.
A	Formation of Energy band in solid (Brief Explanation). Valance band, Conduction Band, Forbidden Gap Classification of solid on the basis of band theory. (Conductor, Semiconductor and Insulator)	02	1,11

	Intrinsic & Extrinsic Semiconductor.		
B	Fermi-level and position of Fermi level in intrinsic (With derivation i.e. [E_f =(Ec + Ev) /2) and extrinsic semiconductors	02	1,11
C	Conductivity in semiconductors- Brief explanation. (Derive Expression for Intrinsic, P-Type, N-Type semiconductor) (Numerical.)	01	1,11
D	Formation of P-N junction, Diode under forward and reverse bias.	01	1,11
E	Hall Effect, Determination Hall Coefficient. (Numerical)	02	6,1

Guidelines for the examiner and paper setter.

1) Question should not be asked on working of LED.

Unit - V
Teacher should facilitate learning of Optics & various optical Phenomenons'

Optics		Lecture required	Reference No
A	Interference- Basic Introduction Michelson's Interferometer (Construction, Working) Applications of Michelson's interferometer- wavelength determination, Refractive index of thin film, thickness of transparent material, (Numerical)	03	7,1
B	Diffraction, Theory of plane transmission diffraction grating Determination of wavelength by grating, Rayleigh's criteria of resolution, Resolving power of grating. (Numerical)	03	7,1
C	Polarization, Polarization by reflection, Brewster's law, law of Malus, Dichroism, Polaroid's, Engineering application of polarization (Numerical)	02	7,1

Guidelines for the examiner and paper setter.

1) Distinguish between Fresnel and Fraunhofer diffraction should not be asked.

2) Question should not be asked on resolving power of telescope.

3) Question should not be asked on double refraction, Nicol prism

Reference Books:

1. R K Gaur, S L Gupta, "Engineering Physics", Dhanpath Rai Publications.
2. P S Aithal, H J Ravindra, "Engineering Physics", Acme Learning.
3. G Vijaya kumari , "Engineering Physics" , Vikas Publications.
4. M R Srinivasan, "Physics for Engineers", New Age International Publishers.
5. C S Solanki, "Solar Photovoltaic", PHI Learning Private Limited.
6. S O Pillai, "Solid state Physics", New Age International Publishers.
7. Ajay Ghatak, "Optics", TMH.
8. Hugh D Young, Roger A Freedman, "University Physics (With Modern Physics)", Pearson.
9. Hintendra K Malik, A K Singh, "Engineering Physics", Mc Graw Hill.
10. K Rajgopal, "Engineering Physics", PHI Learning Private Limited.
11. M N Avadhanulu, P G Kshrisagar, "Text book of Engineering Physics", S. Chand.
12. Uma Mukharji, "Engineering Physics" , Narosa Publishing House
13. S Deswal, A Deswal, "Basic Course of Environmental Pollution", Dhanpath Rai Publications.
14. N Subrahmanyam, Brijal, M N Avadhanulu, "Optics", S. Chand.
15. Sanjay Jain, "Engineering Physics", Universities Press (India) Pvt Ltd.

Engineering Chemistry - I

Teacher, Paper Setter and Examiners should follow the following guidelines.

Engineering Chemistry-I

Unit- I

Teacher should facilitate learning of Sources; impurities found in natural water,

		Water	Lecture required	Reference
1	a)	Introduction: Definition of water, impurities of water	01	1,4
	b)	Types of hardness – Units of hardness, causes of hardness of water	01	1,4
	c)	Analysis of water - Chloride contents by Mohr's method, Alkalinity along with numerical.	02	1,4
	d)	Water Softening Process: (i) Lime soda process by Hot continuous process (Numerical based on it) (ii) Zeolite process, (iii) Ion exchange method, (iv) Reverse Osmosis method	03	1,4
	e)	Effect of hard water in steam generation, priming, foaming, caustic embrittlement.	01	1,4

Guidelines for the examiner and paper setter

1) Question should not be asked on introductory part.

2) Brief question should not be asked.

3) Numerical question of alkalinity , limesoda should be included.

Unit- II

Teacher should facilitate learning of Sources, Classification, Synthesis, Mechanism of polymerization, Rubber & their types, Vulcanization of rubber.

		Polymer	Lecture required	Reference
2	a) b)	Introduction, Definition, functionality. Classification: on the basis of chemical composition, synthesis, intramolecular forces.	01	1,4
	c)	Types of polymerization – addition &condensation polymerization with mechanism and examples.	01	1,4

			Lecture required	Reference
d)	Plastic – Types of plastic – Thermoplastic & thermosetting	01	1,4
e)	Plastic Compounding of plastic & their functions.		
f)	Explanation & different types with their properties & applications(i) PVC (ii) Teflon (iii) Polyurethane (iv) Polycarbonate (v) Polystyrene	02	1,4
g)	Rubber - Types of rubber- natural & synthetic Vulcanization of rubber: drawbacks of natural rubber.	01	1,4
h)			
i)	Synthetic Rubber - Synthesis, structure, properties & applications of- (i) Styrene butadiene rubber (SBR) (ii) Neoprene rubber (iii) Nitrile rubber (iv) Butyl rubber	02	1,4

Guidelines for the examiner and paper setter

1) Question should not be asked on introductory part.

2) Brief question should not be asked.

Unit- III

Teacher should facilitate learning of Types, classification, properties, Composition,

manufacturing of cementing materials & chemistry behind their applications.

		CEMENT	Lecture required	Reference
3	a)	Definition, Classification and properties - Natural, Puzzolona & Port land	02	1,3
	b)	Chemical constituent of Portland cement.	01	1,3
	c)	Manufacture of Portland cement by dry process.	01	1,3
	d)	Manufacture of Portland cement by dry process (using flow sheet diagram)	02	1,3
	e)	Setting & Hardening of Portland cement with chemical reaction	01	1,3
	f)	Heat of hydration of cement.	01	1,3

Guidelines for the examiner and paper setter

1) Question should not be asked on introductory part.

2) Brief question should not be asked.

Unit- IV

Teacher should facilitate learning of Classification, Manufacturing, Drying & firing of ceramics wares, Properties and Applications of ceramics.

		CERAMICS	Lecture required	Reference
4	a)	Introduction, Definition	02	1,10
	b)	Classification of ceramics such as functional & structural classification.		
	c)	Basic raw materials for ceramic preparation – clays, feldspars and flint or sand		
	d)	Manufacture of ceramic by flow sheet diagram	01	1,10
	e)	Drying of ceramic wares – mechanism of drying, drying rate & shrinkage, methods of drying such as drying shades, cross – circulating drying, hot floor drying	02	1,10
	f)	Firing of ceramic wares - Effect of heat on ceramic ware, Effect of heat on shrinkage & porosity.		
	g)	Properties of ceramic material – 1.Mechanical Properties such as Tensile strength, compressive strength, torsional strength, plastic deformation 2.Thermal properties such as thermal conductivity, thermal shock resistance 3.Electrical properties such as insulator, ceramic conductor, ceramic semiconductors.	03	1,10
	h)	Application of ceramics		
Guidelines for the examiner and paper setter				
1) Question should not be asked on introductory part.				
2) Brief question should not be asked.				

Unit- V

Teacher should facilitate learning of Necessity, Classification, Preparation, Composition, properties & application of alloys. Applying the knowledge of alloys to protect metallic & non metallic surfaces

		ALLOYS	**Lecture required**	**Reference**
5	a) b) c)	Introduction, Necessity (Purpose) of making alloys Classification of alloys	02	1,4
	d)	Preparation of alloys – Fusion method, Electro deposition method	02	1,4
	e)	Composition , properties & application of following - Brass, Duralumine Steel – Mild, Medium & High Bronze Nichrome	04	1,4
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked.				

NOTE: - No question should be asked on introductory part.

Reference Books:

1. B K Sharma, Krishna, "Engineering Chemistry", Prakashan Media (P) Ltd.
2. Suba Ramesh, "Engineering Chemistry", Wiley India Pvt. Ltd..
3. Jain & Jain, "Engineering Chemistry", Dhanpat Rai Publishing Co.
4. S S Dara, "A Text Book of Engineering Chemistry", S Chand & Co. Ltd.
5. R Gopalan, "A Text book of Engineering Chemistry", Vikas Publishing House Pvt. Ltd. Third Edition
6. B S Chauhan, "Engineering Chemistry", University Science Press, Third Edition.
7. Shashi Chawla, "A Text book of Engineering Chemistry", DhanpatRai Publishing Co.
8. V R Gowariker, "Polymer Science". New Age International.
9. Abhijit Mallick, "Engineering chemistry", Viva books.
10. Das R K, "Industrial Chemistry", Asia Pub. Hause, New York, 1966
11. Sunita Ratan, "Engineering chemistry", S K Kataria & Sons.

Engineering Mathematics - I

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit- I

Teacher should facilitate learning of basic about elementary row and column transformations.

MATRIX ALGEBRA		Lecture required	Reference No.
a	Definition of Elementary Transformations, Normal Form, Canonical Form & Rank of Matrix.	01	3,4
b	System of Linear Equations. (By using rank of matrix) for both Homogeneous & non-homogeneous system.	02	3,4
c	Eigen values & Eigen vectors, Orthogonal Matrix.	02	3,2
d	Introduction to Cayley-Hamilton's Theorem. (without proof), Applications of Matrices (Translation, Scaling, Rotation)	03	3,5
Guidelines to paper setters: **i)** No question should be asked on introductory part. **ii)** No question should be asked on Normal form, canonical form and rank of matrix. **iii)** No question should be asked on Cayley Hamilton theorem.			

Unit- II.

Teacher should facilitate learning of basic about differentiation.

CALCULUS OF FUCTIONS OF SINGLE VARIABLE		Lecture required	Reference No.
a	Introduction to Successive Differentiation with standard formulae, Leibnitz's Theorem (without proof).	02	3,5
b	Taylor's & Maclaurin's Theorems (Without proof). Expansion of Functions by using Taylor's Theorem, Maclaurin's Theorem & Leibnitz's Theorem	04	2,5
c	Applications of Taylor's Theorem	02	2,3
Guidelines to paper setters: **i)** No question should be asked on introductory part. **ii)** Questions on expansion should be restricted on statement of Maclaurin's theorem.			

Unit- III

Teacher should facilitate learning of basic about integral calculus.

INTEGRAL CALCULUS		Lecture required	Reference No.
a	Gamma Function	02	4,5
b	Beta Function	03	5,6
c	Differentiation under Integral Sign. (No Verification of Rule)	02	4
d	Error function	01	4,6
Guidelines to paper setters: **i)** No question should be asked on introductory part. **ii)** No question should be asked on verification of rule of differentiation under integral sign.			

Unit- IV

Teacher should facilitate learning of basic about variable separable form of differential equation and general solution of differential equation 1st order & 1st degree.

DIFFERENTIAL EQUATION & IT'S APPLICATIONS (1st ORDER & 1st DEGREE)		Lecture required	Reference No.
a	Exact Differential Equation. Non-Exact Differential Equation.(Reducible to Exact Differential Equation by using Integrating Factor).	03	3,7
b	Linear Differential Equation. Reducible to Linear Differential Equation.	03	3,7
c	Applications of Differential Equation to Simple Electrical Circuits & Conduction of Heat.	02	3,7
Guidelines to paper setters: **i)** No question should be asked on introductory part.			

Unit- V

Teacher should facilitate learning of basic about complex number, Cartesian and polar form of complex number.

COMPLEX NUMBER		Lecture required	Reference No.
a	Introduction to Circular Functions, Hyperbolic Functions & Inverse Hyperbolic Functions & their relations (without proof).	02	4,6

b	Hyperbolic Functions	02	4,6
c	Logarithm of a Complex Number.	02	4,6
d	Separation into Real & Imaginary Parts.	02	4,6

Guidelines to paper setters:

i) No question should be asked on introductory part.
ii) Short questions should be asked on separation into real and imaginary parts.

Reference Books:

1. Erwin Kreyszig, "Advanced Engineering Mathematics" (New Edition) Wiley Eastern Ltd.
2. C R Wylie, "Advanced Engineering Mathematics", TMH New Edition.
3. B S Grewal, "Higher Engineering Mathematics", Khanna Publication.
4. H K Das, "Advanced Engineering Mathematics", S. Chand & Company.
5. B V Ramana ,"Engineering mathematics", (New Edition) TMH.
6. N P Bali, "A Text Book of Engineering Mathematics", Laxmi Publication.
7. Babu Ram, "Engineering Mathematics", Pearson Education.

Note: i) No question should be asked on introductory part.

ii) Tutorial batch should be of 30 students.

Elements of Civil Engineering & Engineering Mechanics

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit - I

1. Teacher should facilitate learning of Resultant and equilibrium of coplanar force systems.

1.			Lect. required	Reference No.
	a	**A) Resultant of coplanar forces** Introduction, basic concepts, principle of mechanics, force systems, composition and resolution of forces, resultant of concurrent force system in plane,	02	02 01
	b	Moment of forces, couples, Varignon's theorem, equivalent force couple systems, resultant of non-concurrent force system in plane.	02	02
	c	**B)Equilibrium of coplanar force system** : Introduction, body constraints, types of supports and loads, free body diagram, conditions of equilibrium, equilibrium of forces in a plane ,	02	02
	d	Lami's theorem, reactions of determinate beams, (simple and compound beams).	02	02

Unit - II

1. Teacher should facilitate learning of Centre of gravity, analysis of structure and friction

2.			Lect. required	Reference No
	a	**A) Centre of Gravity**: - Introduction, centre of gravity/centroid of composite plane figures and curves.	02	03, 04
	b	**B) Analysis of Structure**: - Plane trusses, method of joints and method of sections, cables subjected to point loads.	03	04
	c	**C) Friction**: - Introduction, laws of friction, simple contact friction, ladder friction, applications of frictions on horizontal and inclined plane.	03	04 03

Unit – III

Teacher should facilitate learning of Kinematics of rectilinear and curvilinear motion of particle

3.			Lect. required	Reference No
	a	**A) Kinematics of rectilinear motion of particle**: - Introduction, basic concepts, types of rectilinear motions.	02	06 05
	b	Motion under gravity.	02	05, 06
	c	**B) Kinematics of curvilinear motion of particle**: - Introduction, basic concepts, motion along curved path, rectangular coordinate system.	02	06
	d	Normal and tangential components of motion.	02	06

Unit – IV

Teacher should facilitate learning of kinetics of rectilinear motion of particle including Newton's second law of motion, work, energy and impulse momentum principle.

4.			Lect. required	Reference No.
	a	**A) Kinetics of rectilinear motion of particle**: - D'Alembert's Principle, Newton's second law of motion.	02	08
	b	Introduction to work and energy, impulse momentum principle. (No numerical on work and energy and impulse momentum principle).	02	08
	c	**B) Elements of Civil Engineering: Surveying: Compass**: - Principles of surveying. Introduction to compass.	01	09
	d	Bearing, Whole Circle Bearing and Reduced Bearing systems.	01	09
	e	Local attraction, its detection and correction.	02	09

Unit - V

Teacher should facilitate learning of various aspects and basics of Civil Engineering.

5.			Lect. required	Reference No.
	a	**A) Basic Civil Engineering**: Introduction to various branches of civil engineering, introduction to various civil engineering structures such as buildings, highways, railways, bridges, dams, canals, elevated and ground storage reservoirs etc.	03	12
	b	**B) Building Construction**: Introduction to principles of planning.	02	11
	c	Building rules and bye-laws.	01	10

	d	Load bearing, framed and composite structures, introduction to various parts of buildings.	01	10

Reference Books:

1. Bhavikatti S S & K G Rajashekarappa, "Engineering Mechanics", New Age International Publication.
2. Unadkat Sanju, "Engineering Mechanics", Tech-Max Publications, Pune.
3. Kanitkar T P and Kulkarni , "Surveying and Levelling, Part I", Pune Vidyarthi Graha Prakashan, 24th Edition
4. Bindra and Arora, "Building Construction", Dhanpatrai and Sons, Delhi.
5. N Kumara Swamy and A Ksmeswara Rao, "Building Planning and Drawing" ,Charotar Publishing House Pvt. Ltd, Anand, Gujarat.
6. Satish Gopi, "Basic Civil Engineering", Pearson Education, Delhi, 2008.
7. F P Beer and E R Johnson, "Mechanics for Engineers – Statics", McGraw-Hill Publication, 5th Edition
8. F P Beer and E R Johnson, "Mechanics for Engineers – Dynamics", McGraw-Hill Publication, 8th Edition.
9. S P Timoshenko and D H Young, "Engineering Mechanics", McGraw- Hill Publications, 4th Edition
10. R C Hibbeler "Engineering Mechanics statics and dynamics", Pearson Education, 11th Edition
11. Bendale S R, "Engineering Mechanics", John Wiley & Sons, Delhi, 1st Edition
12. Jaget Babu, "Engineering Mechanics", Pearson Education, Delhi, 1st Edition.
13. Sushilkumar, "Building Construction", Standard Publishers, New Delhi, 2010.
14. Shah M G, Kale C M and Patki S Y, "Building Drawing", Tata McGraw Hill Co. Ltd., New Delhi.

Computer Programming

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit - I

Teacher should facilitate learning of Algorithms, Flowcharts and Types of Programming languages, Programming language tools and data types in C.

1.	Program Development Concepts and Introduction to C		Lect. required	Ref No
	a	Algorithms, flowcharts Understanding basic model of computation, steps for program development.	01	01
	b	Types of programming languages Understanding of different types of programming languages like Machine Level, Assembly and High level languages.	01	02
	c	Programming language tools Compiler, Linker, Interpreter and editor.	02	01
	d	History of C programming Evolution of C programming language.	01	03
	e	Data types in C Discusses the building blocks of the C programming language. It includes descriptions on identifiers, constants and variables.	02	03
	f	Writing simple programs	01	03

Guidelines for Examiners and Paper Setters:

1. Emphasis should be given to introduction of algorithms and flowcharts.
2. Algorithms should be written in natural English language.
3. Simple programs may be asked based on data types in C.
4. In program code variable declaration must be commented with the purpose of variable usage.
5. In program codes, every block / statement must be properly commented.

Unit - II

Teacher should facilitate learning of C operators, expressions and special types of statement such as decision control, iterative, break, control and jump. And basic input/output statements.

1.		Control Structures and Basic Input/output	Lect. required	Ref No
	a	C operators and expressions. Describes the built in operators and how to built expressions using them.	01	04
	b	Introduction to decision control statements. Decision making and branching which talks about the if-else, switch and go to statements.	01	04
	c	Conditional branching statements. if and if-else ladder.	01	04
	d	Iterative statements. While, do-while and for loop	02	05
	e	Nested loops.	01	05
	f	Break, continue and go to statements.	01	04
	g	Basic Input/output statements. printf(), scanf() and formatted input/output.	01	04

Guidelines for Examiners and Paper Setters:

1. Emphasis should be given to logic and syntax.

2. Algorithms may be written in natural English language.

3. Simple program codes may be asked based on above syllabus. At the least 50% of the questions should be based on program codes.

4. In program codes, variable declaration must be commented with the purpose of variable usage.

5. In program codes, every block / statement must be properly commented.

Unit – III

Teacher should facilitate learning of Basic of arrays and strings

1.		Arrays and Strings	Lect. required	Ref No
	a	Declaration and initialization of arrays Array definition and declaration.	01	08
	b	Accessing and storing values in arrays How to access and store array elements.	01	08
	c	Operations performed on arrays Traversal, Insertion, Deletion, Merging and searching array elements.	01	06
	d	One and Two- dimensional arrays Declaration and definition of one-dimensional and two dimensional arrays	01	06
	e	Introduction to strings. Understanding strings in C	01	07
	f	Declaration and initialization of string.	01	06
	g	String operations with and without C library functions.Strlen(),strcpy(),strcat() and strcmp()	02	08

Guidelines for Examiners and Paper Setters:

1. Emphasis should be given to logic and syntax.

2. Algorithms may be written in natural English language.

3. Simple program codes may be asked based on above syllabus. At the least 50% of the questions should be based on program codes.

4. In program codes, variable declaration must be commented with the purpose of variable usage.

5. In program codes, every block / statement must be properly commented.

Unit – IV

Teacher should facilitate learning of C functions declaration, definition and calling, also introduce user defined data type: structure.

1.		Functions and Structures	Lect. required	Ref No
	a	Introduction to functions Need for user defined functions	01	09
	b	Function declaration and definition. Function declaration/function prototype.	02	10
	c	Function call and parameter passing. Function call and call by value.	02	10
	d	Introduction to structures Defining a structure, declaring structure variables.	01	11
	e	Initializing and accessing members of a structure Initializing structure variables, accessing structure variables and typedef.	02	11

Guidelines for Examiners and Paper Setters:

1. Emphasis should be given to logic and syntax.

2. Algorithms may be written in natural English language.

3. Simple program codes may be asked based on above syllabus. At the least 50% of the questions should be based on program codes.

4. In program codes, variable declaration must be commented with the purpose of variable usage.

5. In program codes, every block / statement must be properly commented.

Unit - V

Teacher should facilitate learning of basics of C++ programming language.

1.		Introduction to C++	Lect required	Ref No
	a	Limitations of procedure oriented programming	01	12
	b	Object-oriented programming paradigm.	01	12
	c	Basic concepts of object-oriented programming. Objects, Classes, Data Abstraction and Encapsulation, Inheritance, Polymorphism, Dynamic binding and Message Passing	02	12 & 13
	d	Classes and objects Declaring Classes and access specifiers : public, private and protected	01	12 & 13
	e	Defining member functions and scope resolution operator. Declaration and definition of member functions, use of cope resolution operator	02	12 & 13
	f	Simple C++ program with class and object	01	12 & 13

Guidelines for Examiners and Paper Setters:

1. Emphasis should be given to the introduction of object-oriented programming (OOP).

2. Emphasis should be given to logic and syntax.

3. Algorithms may be written in natural English language.

4. Simple program codes may be asked based on above syllabus. At the least 50% of the questions should be based on program codes.

5. In program codes, variable declaration must be commented with the purpose of variable usage.

6. In program codes, every block / statement must be properly commented.

Reference Books:

1   Vikas Gupta, "Computer Concepts and C Programming", Dreamtech Press.

2   Reema Thareja, "Computer Fundamentals and Programming in C", OXFORD University Press.

3   E Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 2002.

4   E Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 2002.

5   Vikas Gupta, "Computer Concepts and C Programming", Dreamtech Press.

6   Reema Thareja, "Computer Fundamentals and Programming in C", OXFORD University Press.

7   Vikas Gupta, "Computer Concepts and C Programming", Dreamtech Press.

8   E Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 2002.

9   E Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 2002.
10 Reema Thareja, "Computer Fundamentals and Programming in C", OXFORD University Press.
11 Vikas Gupta, "Computer Concepts and C Programming", Dreamtech Press
12 E Balagurusamy "Object Oriented Programming with C++" , Tata McGraw Hill
13 Robert Lafore, "Object Oriented Programming in Turbo C++", Galgotia Publication

Engineering Physics – I

(Engineering Science Lab-I)

Teacher should facilitate learning following lab experiments:

Sr. No	Name of Experiment	Lab hours/week (Alternate Week With EC-I)
1	**Semiconductor diode characteristics.** Determination of forward and reversed characteristics of given semiconductor diode. Analyze the knee voltage of given diode. Comparison of analytical and the practical values.	02
2	**Band gap in semiconductor material.** Determination of forbidden energy gap of given semiconductor, Comparison of analytical and the practical values	02
3	**To determine the resistivity of the given semiconductor by using four probe method.** Determination of the resistivity/conductivity of given semiconductor. Study its variation with temperature.	02
4	**To determine the wavelength of laser source** Determine wavelength of He-Ne Laser using diffraction grating. Study the properties of Laser. Describe the operation of Laser Compare analytical and the practical values.	02
5	**Fiber Optics Communications.** Study of fiber optics communication. Describe the advantages of optical fiber over metallic cables.	02
6	**Hall effect & determination of Hall coefficient.** Study of Hall Effect in semiconductors. Determination of Hall coefficient of semiconductor, Determination of sign of majority charge carrier.	02
7	**Solar cell Characteristics** To study the characteristics of solar cell, To find fill factor and its efficiency. Describe the working of solar cell, its advantages and disadvantages.	02
8	**Spectrometer Grating** To understand diffraction phenomenon. To learn about a diffraction grating.To determine wavelength of light using diffraction grating Compare analytical and the practical values.	02
9	**Michelson's Interferometer** Describe the operation of Michelson's Interferometer. To determine unknown wavelength of monochromatic light. Compare analytical and the practical values.	02
10	**Determination of polarizing angle for glass and to determine refractive index of glass using Brewster's law.** Determination of polarizing angle and refractive index using Brewster's law.	02

11	**Experimental verification of law of Malus** To study law of Malus. Prove- Intensity of polarized light is proportional to $\cos^2\theta$	02
12	**Crystal structure** To Study the given crystal structure	02

Note: Lab journal should consist of minimum five experiments.

Reference Books:

1. M N Avadhanulu, A.A.Dani, P M Pokley , "Experiments in Engineering Physics",

   S. Chand.

2. S P Singh , "Advanced Practical Physics", Pragati Prakshan.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Engineering Chemistry - I

(Engineering Science Lab-I)

Teacher should facilitate learning following lab experiments:

Sr. No.	Experiment	Lab hours per week (alternate with EP-I)
1	**Estimation of total hardness of given sample of water by EDTA Method.** Standardization of EDTA by using standard hard water.Estimation of total hardness of given water sample.	2
2	**Determination of Dissolved oxygen present in given water sample (Winkler's Method).** Standardization of Sodium Thiosulphate solution against std. K2Cr2O7 solution using starch indicator. Calculate exact normality of Sodium Thiosulphate solution. Estimation of dissolved oxygen from given water sample.	2
3	**Determination of alkalinity of water sample.** To find the presence of OH^-, CO_3^{2-} and HCO_3^- ions in given sample of water by titrating against N/10 HCL using phenolphthalein & Methyl orange indicator. Calculate the amount of OH^-, CO_3^{2-} and HCO_3^- ions in given sample by end point results.	2
4	**Estimation of Chloride content in a given water sample by Mohr's Method.** Standardization of $AgNO_3$ solution by using Standard NaCl solution. To find the exact normality of $AgNO_3$ solution. Estimation of Chloride ions in given sample of water. Calculate the strength of Chloride ions in sample water.	2
5	**Estimation of phenol by Iodometrically.** Dilution of Phenol solution. Back titration of the above solution against standard 0.1 N Sodium Thiosulphate solution. Blank titration from brominating stock solution against 0.1 N Sodium Thiosulphate solution. Calculate the percentage of phenol.	2
6	**Preparation of Polystyrene by bulk polymerization.** Add nitrogen to styrene in oil bath. Cool the mixture and break it to give Polystyrene. Dissolve the polystyrene in benzene, filter the precipitate and dry it. Calculate the yield percentage.	2
7	**Preparation of Phenol Formaldehyde Resin (Bakelite).** Dissolution of Glacial acetic acid, formaldehyde and phenol. Acidifying the above solution. Washing the residue obtained with distilled water and dry it. Calculate of the yield of Phenol formaldehyde resin.	2

Sr. No.	Experiment	Lab hours per week (alternate with EP-I)
8	**Estimation Copper in Brass Iodometrically.** Prepare given brass sample by acidifying, neutralizing and dilution in volumetric flask. Determine the amount of Copper in diluted brass sample solution by volumetric titration. Calculate the percentage of copper in given Brass Sample.	**2**
9	**Estimation of Zinc from Brass Volumetrically.** Standardization of $K_4[Fe(CN)_6]$ by using Uranyl nitrate indicator. Dilution of the brass sample. By removing Sn, Pb, Cu, Fe from the solution. Titrating the remaining solution against $K_4[Fe(CN)_6]$ and calculate the percentage of Zinc in Brass sample.	**2**
10	**Determination of percentage of Calcium in Cement.** Dilution of the cement sample in NH_4Cl Solution. Distilled off and filter the solution. To the above filtrate add NH_4NO_3 solution, keep the filtrate and washing for the estimation of Lime. Estimation of Lime- Rectify the solution then add methyl red indicator along with ammonium oxalate solution. Calculate the amount of Calcium using oven and estimate the percentage of lime from the sample. Also find the percentage of calcium by volumetric analysis using $KMNO_4$ solution.	**2**

Note: Lab journal should consist of minimum five experiments.

Reference:

1) Shashi Chawla , "Essentials of Experimental Engineering Chemistry ", Dhanpat

   Rai Publishing Company (P) Ltd.

2) Sudha Rani , "Laboratory Manual on Engineering Chemistry ", Dhanpat Rai

    Publishing Company (P) Ltd.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Computer Programming Lab

Teacher should facilitate learning following lab experiments:

		Group-A	Lab hours required
	1	**Program for basic arithmetic operations and expressions** Performing simple arithmetic operations (addition, subtraction, multiplication, division)	02
	2	**Program for finding roots of a quadratic equation, square root of a number** Finding roots of any quadratic equation and square root of any given number	02
	3	**Find area and volume of geometric objects** Calculate area and volume of geometric objects (circle, square, triangle etc.)	02
	4	**Finding greatest and smallest of 2/3 numbers** To find smallest and largest numbers from given 2 or 3 numbers.	02
	5	**Generating odd / even numbers** To generate odd and even numbers.	02
	6	**Finding factorial of a number** Calculate the factorial of any given number.	02
	7	**Checking / generating prime numbers** Generate the prime numbers.	02
	8	**Checking for Armstrong numbers** Generate the Armstrong numbers.	02
	9	**Checking a number for palindrome** Check the given number for palindrome.	02
	10	**Finding GCD of two numbers** Calculate GCD of any two numbers.	02
	11	**Generating sine /cosine series/value** Generate the sine/cosine series.	02
	12	**Solving a linear equation** To solve the linear equation.	02
	13	**Printing a number in words** Print any given number in words.	02
	14	**Greatest / smallest/ sum /average of 'n' numbers** Find the greatest/smallest/sum/average of any given n numbers	02
	15	**Integer to binary / hex and octal conversion** To integer to binary, hex and octal.	02

Group- B (using Array)		Lab hours required
1	Greatest / smallest/ sum /average of 'n' numbers To find the greatest/smallest/sum/average of given n numbers using arrays.	02
2	Linear / binary search To search a number from given n numbers using linear and binary search.	02
3	Permutation and Combination generation Calculate the permutation and combination.	02
4	String processing / operations Performing string operations using arrays.	02
5	Sorting of numbers and Strings Sorting any string and numbers ascending and descending order using arrays.	02
6	Matrix operations Performing matrix operation (addition, subtraction, multiplication etc.) using arrays.	02
7	Record processing using structure Processing student record using structures.	02

Note:

- Concerned faculty should suitably frame at least **10 practical** assignments **(SIX from PART – A and FOUR from PART – B)** out of the above list.

- Every assignment should include flowchart, algorithm, print out of code with proper comments and output.

- Every student is required to submit the assignments in the form of journal.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Guidelines for ESE:

- ESE will be based on the practical assignments submitted by the students in the form of journal.

- In the ESE, the students may be asked to perform the practical assignment with minor modification.

- Evaluation will be based on the paper work of flowchart and algorithm, understanding of the logic and the syntax, quality of program code, execution of the program code, type of input and output for the program code.

Reference Books:

1. E Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 4/E, 2007.
2. E Balagurusamy "Object Oriented Programming with C++", Tata McGraw Hill, 4/E, 2008.
3. Yashavant Kanetkar, "Let Us C" , BPB Publications ,10/E, 2010.
4. Reema Thareja, "Computer Fundamentals and Programming in C", OXFORD University Press, 2012.
5. Stephen G Kochan "Programming in C",Pearson Education , 3/E, 2004.
6. Ashok N Kamthane, "Computer Programming", Pearson Education , 2/E,2008.
7. Vikas Gupta, "Computer Concepts and C Programming", Dreamtech Press, 2009.
8. K R Venugopal and S R Prasad ,"Mastering C", Tata McGraw Hill, 1/E, 2011.
9. Behrouz A Forouzan, Richard F Gilberg, "COMPUTER SCIENCE – A Structured Programming approach using C", Thomson, 3/E Indian Edition, 2007.
10. Kernighan, Ritchie, "The C Programming Language", Prentice Hall of India , 2/E, 1988.
11. Pradeep K Sinha and Priti Sinha, "Computer Fundamentals", BPB Publications , 4/E, 2007.
12. Robert Lafore, "Object Oriented Programming in Turbo C++", Galgotia Publication, 2003.

Elements of Civil Engineering & Engineering Mechanics Lab

Teachers and Examiners should follow the following guidelines.
1. Teacher should facilitate following lab experiments/assignments:

Group-A		Lab hours required
1	**Study of Vectors** Study of vector will be discuss with respect to force vector, which includes rectangular component of vector, unit vector, calculation of resultant of force vector and application of equilibrium conditions i.e. $\sum$ Fx = 0, $\sum$ Fy = 0, $\sum$ Fz = 0	02
2	**Verification of law of polygon of forces** Verification of law of polygon of forces to understand the concept of force polygon. Statement and verification of law of polygon of forces.	02
3	**Verification of Lami's theorem** Statement of Lami's theorem, study the relation between force and angle between other two forces, concept of concurrent force to understand the concept of equilibrium and verification of force using universal force table.	02
4	**Reactions of beam** Define beam, types of support and support reactions, types of load on beam, conditions of equilibrium for non-concurrent coplanar force system, calculate support reactions using beam apparatus.	02
5	**Simple friction on horizontal and inclined planes.** Describe friction force, limiting friction coefficient of friction, laws of friction, F α R, calculate coefficient of friction for bodies in equilibrium on inclined planes.	02
6	**Forces in jib crane** Explain concurrent forces and law of triangle of forces, explain jib-crane apparatus, explain graphical condition of equilibrium of coplanar concurrent fore system, know the nature comparison of observed forces and calculated forces in members of jib crane.	02
7	**Study of simple machines and verification of the law machines** Define mechanical advantage, velocity ratio, efficiency, friction, effort and explain law of machine. Describe screw jack and single purchase crab and verify the law for both the apparatus.	02
8	**Graphical work (statics) - minimum three problems on graphical solution of Static's problems.** To understand graphical method to solve the problems in statics. a. To solve the problem on coplanar concurrent forces, parallel forces and reactions of beam by graphical method. b. To describe Bow's notation, space diagram, vector diagram, polar diagram, funicular diagram and to draw the same.	04

9	**Graphical work (dynamics) - minimum three problems on graphical solution of Static's problems.** a. To draw the motion curve and understand significance of the same. b. To calculate displacement and distance travelled from V-T diagram	04

Note: The laboratory journal should consist of six experiments/assignments from group A. Assignment no. 8 and 9 are compulsory. Any four out of remaining seven experiments/assignments are to be conducted.

	Group-B	**Lab hours required**
1	**Observations of bearings by using Prismatic Compass and calculations of included angles.** Explain whole circle bearing and quadrantal bearing system, conversion of bearing, fore bearing and back bearing, explain prismatic compass, calculation of includes angles from observed bearing in closed transverse.	02
2	**2) One assignment based on fifth unit. Any one of the following.** a. Write notes on the following: Various branches of civil engineering such as Structural Engineering, Water Resources Engineering, Geotechnical Engineering, Transportation Engineering, Environmental Engineering, Building Science and Construction Management. b. Write notes on the following Civil Engineering structures such as buildings, highways, railways, bridges, dams, canals, elevated & ground storage reservoirs. c. i) Explain principles of planning. ii) Differentiate between load bearing and framed structures with neat sketches.	02

Note: The laboratory journal should consist of above two experiments /assignments from group B.

Reference Books. :

1. Bhavikatti S S & K G Rajashekarappa, "Engineering Mechanics", by New Age International Publication.
2. Unadkat Sanju, "Engineering Mechanics", Tech-Max Publications, Pune.
3. Kanitkar T.P. and Kulkarni, "Surveying and Levelling, part I", Pune Vidyarthi Graha Prakashan.
4. Bindra and Arora, Dhanpatrai, "Building Construction" ,
5. N. Kumara Swamy, A. Ksmeswara Rao, Charotar, "Building Planning and Drawing", Publishing House Pvt. Ltd.
6. Satish Gopi, "Basic Civil Engineering", Pearson Education, Delhi.

Guide lines for ICA :

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Guide lines for ESE:

ESE will be based on practical assignments submitted by the student in the form of journal. In ESE the student may asked to answer questions based on experiments/assignments. Evaluation will be based on performance in oral examination.

Workshop Practice- I

Teacher and Examiner should follow the following guidelines.
Unit - I
1. Teacher should facilitate following lab experiments:

	Workshop Practice I	Lab hours required
1	**Measuring Instruments** Demonstration of handling measuring instruments like steel rule, measuring tape, try-square, vernier caliper, micrometer, vernier height gauges, bevel protector etc. **Fitting shop** One job on finishing two sides and make right angles of square job by filling operation, one drilling and taping operations. **Note:** The job must be finished to the following limits: + 0.5mm -0.5mm Submit Workshop book comprising of Job drawing, job process sheet, sketches of tools used.	04
2	**Welding Shop** One Job on T-joint: one side of T-joint welded by Gas welding and another by Electrical Arc Welding Demonstration of Brazing. **Note:** Submit Workshop book comprising of Job drawing, job process sheet, sketches of tools used.	04
3	**Tin Smithy** One job including soldering, Riveting etc. For example- letter box, Waste paper basket, tray, Funnel etc. **Note:** Submit Workshop book comprising of Job drawing, job process sheet, sketches of tools used.	04
4	**Black Smithy** One job on black smithy including Bending and Flattening For example: S-shape, hook shape, U shape job. **Note:** The job must be finished to the following limits: +2mm -2mm Submit Workshop book comprising of Job drawing, job process sheet, sketches of tools used.	02
5	**Foundry Shop** Demonstration of preparation of molding, casting of any simple pattern.	04
6	**Computer Hardware Workshop** Introduction to Personal Computers, PC Main Parts: CPU, Input and Output devices. Introduction of Floppy & CD drives, HDD, CD, DVD, USB Flash Drives, and Memory Cards. Introduction of Motherboard, I/O connectors. Installation of cards, devices and connecting cables, Identification of cables of computers (connecting media)	04

Reference Books.

1. Hajara Chaudhary and Bose S K, "Element of Workshop Technology Volume I and II", Asia Publishing House.
2. P N Rao, "Production Technology Volume I and II", Tata McGraw Hill Publication.
3. R K Jain, "Production Technology", Khanna Publications.
4. P C Sharma, "Production Technology", Khanna Publication.
5. Chapman W A J, "Workshop Technology", ELBS Publication.
6. HMT, "Production Technology", Tata McGraw Hill Publication.
7. Kannaiah K L, Narayana, "Workshop Manual", Scitech Publications, Chennai, 2nd Edition.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Soft Skills- I

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit – I

1. Teacher should facilitate learning of
       Communication, Listening, Assertion

1.	Unit I: Communicate With Confidence		Lect. required	Practical	Ref No
	a	**Chapter 1:** Communication Skills and Barriers to Communication 1.1 Communication – What is it and Why do we need it 1.2 Ineffectiveness of most communication 1.3 Common communication Spoilers 1.4 Components of Communications 1.5 Proportion of Components for Effective Communication 1.6 Summary 1.7 Activities	01	02	01
	b	**Chapter 2:** Listening Skills 2.1 Importance of Listening 2.2 Listening Defined 2.3 Listening Skills Clusters 2.4 Attending Skills 2.5 Following Skills 2.6 Reflecting Listening 2.7 Summary 2.8 Activities	01	02	02
	c	**Chapter 3**: Assertion Skills 3.1 Three Communication Styles 3.2 Identifying Communication Styles 3.3 Your Assertive Goals 3.4 Assertive Expression 3.5 Responding to Criticism 3.6 Assertive Strategies 3.7 Summary 3.8 Activities	01	02	02

Unit - II
1. Teacher should facilitate learning of
Language learning techniques, English pronunciation, sentence templates

2.		Speaking to be Understood	Lect required	Practical	Ref No
	a	**Chapter 4:** Basic Corpus for Formatted Feeding 4.1 Linguistic Shyness 4.2 Languages are Installed NOT Learnt 4.3 The Art and Science of Bouncing 4.4 Mental Rehearsal and Obsession with Meaning 4.5 Authentic Vs Non-authentic Corpus 4.6 Some Definitions 4.7 Summary	01	02	03
	b	**Chapter 5:** A Matter of Pronunciation 5.1 Energizing the Sentences 5.2 Basic Sentences for Bouncing 5.3 The Knowledge of Sounds in English 5.4 English is a Stress Oriented Language 5.5 Summary 5.6 Activities	01	02	03 04
	c	**Chapter 6:** Pattern Drills and Dialogues 6.1 List of Verbs and Verb Phrases for Drill 6.2 Sentence Generating Exercise 6.3 Substituting Items from a List 6.4 Activities	01	02	03

Unit – III
Teacher should facilitate learning of public speaking, audience assessment and influence

3.		Public Speech	Lect required	Practical	Ref No
	a	**Chapter 7:** Influencing Others 7.1 Ineffective Strategies for Influencing Change 7.2 Effective Strategies for Influencing Change 7.3 Your Plan for Influencing Change 7.4 Summary 7.5 Activities	01	02	05
	b	**Chapter 8**: Speaking in Public 8.1 Defining Your Purpose 8.2 Outlining the Subject 8.3 Presentation 8.4 Organization 8.5 Audience Analysis 8.6 Style 8.7 Supporting Material 8.8 Delivery 8.9 Summary 8.10 Activities	01	02	05

		Chapter 9: Learning to Read Through Body and Voice 9.1 The Importance of Body Language 9.2 The Language of Feelings 9.3 Guidelines of Reading Body Language 9.4 Reflecting the Feelings Back to the Sender 9.5 Study of Proxemics 9.6 Improving Voice Quality 9.7 Emotional Energy and Its Role 9.8 Summary 9.9 Activities			
	c		01	02	05

Unit – IV

Teacher should facilitate learning of presentation skills, overcoming stage fear, e-presentation preparation.

4.	**Effective Presentations**		**Lect required**	**Practi cal**	**Ref No**
	a	**Chapter 10**: Formulas and Advanced Techniques of Presentations 10.1 Two Hour Formula 10.2 What do You Want the Audience to Do or Know 10.3 Active Visual Aids 10.4 Choose Your Opening 10.5 Choose Your Conclusion 10.6 Excuses 10.7 Summary Activities	01	02	06
	b	**Chapter 11:** E-Presentations 11.1 How to Start in Powerpoint 11.2 Choosing a Suitable Background 11.3 Fonts, Text and Colours 11.4 Animations and Transitions 11.5 Length of the Presentation 11.6 Balancing Between Text and Graphics 11.7 Summary 11.8 Activities	01	02	06
	c	**Chapter 12:** The Fear Factor 12.1 Cannot Kill Fear 12.2 Living with the Devil 12.3 Techniques of Minimising Fear 12.4 Fear is Good 12.5 Summary 12.6 Activities	01	02	06

Unit - V

Teacher should facilitate learning of writing skills, vocabulary development

5.	Eloquent Writing-1		Lect required	Practical	Ref No
a	**Chapter 13:** Comprehension of Passages 13.1 Reading Techniques 13.2 Understanding Complex Words and Sentences 13.3 Strategies for Answering Questions Following Passages 13.4 Summary 13.5 Activities		01	02	7&8
b	**Chapter 14:** Understanding of English Language 14.1 Usage of Articles, Prepositions and Conjunctions 14.2 Tense Matching 14.3 Error Detection 14.4 Summary 14.5 Activities		01	02	7&8
c	**Chapter 15:** Vocabulary Enhancement Practice 15.1 Synonyms 15.2 Antonyms 15.3 Analogies 15.4 Summary 15.5 Activities		01	02	7&8

Reference Books:

1. Allan and Barbara Pease, "A Definitive Book on Body Language", Publication Bantam Books.
2. Robert Bolton,"People Skills: How to Assert Yourself, Listen to Others and Resolve Conflicts", Publication Simon and Schuster.
3. R K Iyer, "Spoken English", IU Publications.
4. Sethi and Dhamija ,"A Course in Phonetics and Spoken English", Prentice Hall of India.
5. Matthew McKay ,"The Communication Skills", Publisher: New Harbinger Publications Inc.
6. Frank Paolo ,"How to Make a Great Presentation in 2 Hours", Pustak Mahal.
7. Kaplan's GRE, Kaplan Publications.
8. Barron's GRE, Galgotia Publications.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

NORTH MAHARASHTRA UNIVERSITY, JALGAON (M.S.)

Teacher and Examiner's Manual

First Year Engineering

(Common to all branches)

Faculty of Engineering and

Technology

SEMESTER-II

W.E.F 2012 – 2013

Engineering Physics - II

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit – I

Teacher should facilitate learning of Acoustic, Importance of acoustic in our day to day Life. Learning of Ultrasonic, Production & its Engineering Applications.

Acoustics &Ultrasonic's			Lecture required	Reference No.
A		**Acoustics**	02	1,3
	A	Introduction: Elementary acoustics. Echo, Reverberation, Reverberation time, Sabine's formula (without derivation) , Coefficient of absorption ,Loudness,Decible. Acoustic Intensity.		
	B	Intensity Level (With Formula), Limits of Audibility, Acoustical planning of building, Factors affecting the architectural acoustics of building & their remedy Numerical	02	1,3
B		**Ultrasonic Waves**		
	A	Ultrasonic waves, Production of ultrasonic waves -by 1) Piezoelectric generator its merit & Demerit 2) Magnetostriction oscillator- Its merits & demerits	02	1,3
	b	Properties of ultrasonic wave. Engineering applications of ultrasonic waves Numericals	02	1,3
Guidelines for the examiner and paper setter. Derivation of Sabine formula should not be asked. No brief explanation of application of ultrasonic wave				

Unit - II

Teacher should facilitate learning of Basics of Magnetism & Superconductivity

Magnetic Materials and Superconductivity			Lecture required	Reference No.
A		**Magnetic Materials**	01	3,12
	a	Introduction, Origin of Magnetism Classification of magnetic materials into Para magnetism, Diamagnetism & Ferromagnetism.		
	b	Properties of Para magnetism, Diamagnetism & Ferromagnetism.Hysteresis loop (Explanation with Hysteresis loop diagram), Numericals	02	3,12
	c	Hard and Soft magnetic materials, (Distinguishing points of both materials) Ferrites – production, properties & applications	01	3,12

		Superconductivity		
B	a	Super conductor, Properties of superconductor (Electrical Resistance, Effect of Impurity, Effect of Pressure & Stress, Isotope effects,Magnetic field effect, critical current, Persistent current.) **Brief explanation of All these properties ,Numerical**	01	3,12
	b	Type-I Superconductor , Type –II Superconductor, Comparison between them Meissner's effect, Applications of superconductor.	03	3,12

Guidelines for the examiner and paper setter.

1) Question should not be asked on introductory part.

2) Question should not be asked on BCS theory.

3) Do not ask numerical on superconductivity.

Unit – III

Teacher should facilitate learning of Basic of **Modern Physics & Spectroscopy**

Modern Physics & Spectroscopy			Lecture required	Reference No.
A		**Modern Physics**		
	a	Introduction Motion of Charged particle in electric field, in magnetic field, and Combined field	02	9,12
	b	Numericals on motion of charged particle, Electron microscope (SEM) , positive ray.	01	9,12
	c	Principle, Block diagram, and Working of Cathode Ray Oscilloscope , Numerical	01	9,12
	d	Bainbridge Mass Spectrograph(Principle ,Construction and Working), Numerical	01	9,12
B		**Spectroscopy**		
	a	Zeeman Effect (normal and anomalous) experimental arrangement of normal Zeeman effect.	01	4,13
	b	Numericals on Zeeman effect, Nuclear Magnetic Resonance, (NMR) Magnetic Resonance Imaging (MRI)	02	4

Guidelines for the examiner and paper setter.

1) Question should not be asked on introductory part.

Unit – IV

Teacher should facilitate learning of **Quantum Physics**

Quantum Physics		Lecture required	Reference No.
A	Wave nature of matter, wave particle duality De- Broglie's Wave, Wavelength of matter wave –In terms of KE (For Electron)	01	9,13
B	Numericals on deBroglie wavelength Concept of group velocity, phase velocity & wavepacket.	01	9,13
C	Heisenberg's uncertainty principle with illustration (Determination of the position of a particle by Microscope and Diffraction by single slit),(Numerical),	02	9,12
D	Physical significance of wave function Schrodinger's time independent and time dependent wave equation.	02	9,14
E	Application of Schrodinger's time independent wave equation to the problem of particle in rigid box. Derivation and Numerical	02	9,14
Guidelines for the examiner and paper setter. 1) Question should not be asked on spherically symmetric potential well.			

Unit - V

Teacher should facilitate learning of **Nano science & Technology**

Nano science & Technology		Lecture required	Reference No.
a	Introduction of Nano particles, Properties of Nano particles (Optical, electrical, magnetic, structural, Mechanical),	02	5
b	Brief description of different methods of synthesis (Physical, Chemical, Biological, Mechanical),	02	5
c	Classification of Nano materials Fabrication Process-Top-down approach, Bottom up Approach.	02	5
d	Applications of nanotechnology Advantages & Limitations of Nano-materials	02	5
Guidelines for the examiner and paper setter. 1) Question should not be asked on introductory part.			

Reference Books:

1. R K Gaur, S L Gupta, "Engineering Physics", Dhanpat Rai.
2. M R Srinivasan, "Physics for engineers", New Age International Publishers.
3. M N Avadhanulu, P G Kshrisagar,"Text book of Engineering Physics", S.Chand.
4. Brijlalal, Subramanyam, "Atomic and Nuclear Physics", S. Chand.

5. S K Kulkarni, "Nanotechnology, principles & Practices", Capital Publication Co.
6. Rajgopal, "Engineering Physics", PHI Learning Private Limited.
7. G S Raghuvanshi, "Engineering Physics", PHI Learning Private Limited.
8.   G Vijayakumari, Engineering Physics", Vikas Publishing House.
9. Hugh D Young, Roger A Freedman," University Physics(With Modern Physics)", Pearson.
10. Uma Mukharji, "Engineering Physics", Narosa Publishing House.
11. S O Pillai, "Solid state Physics", New Age International Publishers.
12. Beiser ,"Concept of modern physics", Tata macgraw-hill.
13. R B Singh, "Introduction to modern physics", New age   Publication.
14. Satyapraksh, "Quantum Mechanics", Pragati Prakshan.

Engineering Chemistry - II

Teacher, Paper setter and Examiner should follow the following guidelines.

UNIT- I

Teacher should facilitate learning of Classification, Characteristics of good fuel, Determination of Calorific value of solid, liquid & gas fuels.

1	FUELS & COMBUSTION		Lecture required	Reference
	a)	Introduction – Definition, classification of Fuel, Calorific value & its units	01	1,3
	b)	Characteristics of good fuel	01	1,3
	c)	*Solid* Fuel: Analysis of Coal- Proximate analysis – Determination & its significance Ultimate analysis – Determination & its Significance Determination of Calorific Value by Bomb calorimeter (Numerical based on it).	02	1,3
	d)	*Liquid Fuel:* Refining & fractional distillation of LPG, petroleum, gasoline, diesel, kerosene. Power Alcohol: - Preparation, properties & Uses Biodiesel – preparation, properties & uses. *Gaseous Fuel:* Preparation, properties & uses of (i) Water gas, (ii) Natural gas.	02	1,3
	e)	Determination of Calorific Value of gaseous Fuel/Volatile liquid by Boy's Gas Calorimeter (Numerical based on it).	01	1,3
	f)	Combustion: Chemical reactions, calculation on air requirement for combustion (Numerical based on it).	01	1,3
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked. 3) Numerical question of bomb , boy's calorimeter and combustion should be included.			

UNIT- II
Teacher should facilitate learning of Importance & mechanism of lubrication.

2	LUBRICANT		Lecture required	Reference
	a)	Introduction: Classification, characteristics	01	1,3
	b)	Mechanism of lubrication – Fluid Film, boundary & extreme-pressure lubrication	01	1,3
	c)	Properties of lubricant – *Physical properties with Experimental determination* Viscosity & Viscosity Index by Red wood viscometer. Flash & fire point by Pensky - Marten's apparatus,Cloud & pour points, Oiliness *Chemical properties with determination* Saponification value,Acid value, Emulsification	04	1,3
	d)	General Criteria for selection of lubricants for delicate machine, IC engine, gears, cutting tools, transformer & refrigeration system	02	1,3
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked.				

UNIT- III
Teacher should facilitate learning of nature & classification of refractory & abrasive materials

3	Refractories		Lecture required	Reference
	a)	Introduction,	01	1,3
	b)	Types of Refractories, Characteristics of refractories	02	1,3
	c)	Preparation, Properties & application of acidic, basic & neutral refractories (i) Acidic - Alumina, Silica, Fireclay. (ii) Basic - Magnesite, Dolomite. (iii) Neutral - Carbon, graphite.	05	1,3
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked.				

UNIT- IV

Teacher should facilitate learning of Corrosion, Types of corrosion, factors, control methods and its causes & effects.

4		Corrosion	Lecture required	Reference
	a)	Introduction – definition, causes, consequences of corrosion	01	1,3
	b)	Dry & Wet Corrosion - explaination with mechanism	02	1,3
	c)	Types of corrosion – Pitting, waterline, soil, inter granular, Stress corrosion	02	1,3
	d)	Corrosion Control - Design & material selection, anodic & cathodic protection, hot dipping, galvanizing , tinning, electroplating , powder coating& surface coating.	03	1,3
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked.				

UNIT- V

Teacher should facilitate learning of Nature, Causes & consequences of environmental degradation.

5		Pollution	Lecture required	Reference
	a)	Introduction	01	1,10
	b)	Water Pollution: Methods to determine the extent of water pollution –BOD, COD, DO.	02	1,10
	c)	Causes, Effects and Control measures of water pollution,	01	1,10
	d)	Air Pollution: Acid Rain, Green house effects, Depletion of Ozone	01	1,10
	e)	Causes, Effcet and Control measures of air pollution	01	1,10
	f)	Noise Pollution :Causes, effects & Control of noise pollution	01	1,10
	g)	Radioactive pollution: Causes, effects & Control of Radioactive pollution.	01	1,10
Guidelines for the examiner and paper setter 1) Question should not be asked on introductory part. 2) Brief question should not be asked.				

NOTE: - No question should be asked on introductory part.

Reference Books:

1. B K Sharma, "Engineering Chemistry", Krishna Prakashan Media (P) Ltd.
2. Suba Ramesh, "Engineering Chemistry", Wiley India Pvt. Ltd.
3. Jain & Jain, "Engineering Chemistry ", Dhanpat Rai Publishing Co.
4. S S Dara, "A Text Book of Engineering Chemistry", S. Chand & Co. Ltd.
5. Sunita Ratan, "Engineering chemistry", SK Kataria & Sons.
6. R. Gopalan, "A Text book of Engineering Chemistry (Third Edition)", Vikas Publishing House Pvt. Ltd..
7. R K Das, "Industrial Chemistry", Asia Pub. House, New York, 1966.
8. Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Co.
9. Abhijit Mallick, "Engineering chemistry", Viva books.
10. S Deswal, A Deswal, "Basic Course in Environmental Pollution", Dhanpath Rai Publications.

Engineering Mathematics - II

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit – I

Teacher should facilitate learning of basic about partial differentiation.

	Calculus of function of several variables	Lecture required	Reference No.
a	Definition of partial derivative, rules & theorems of partial Derivatives.	01	3,4
b	Euler's theorem on homogeneous function.	02	3,4
c	Change of independent Variable, differentiation of composite function (1st order only)	02	3,4
d	Total differentiation.	01	3,4
e	Differentiation of implicit function.	02	3,4
Guidelines to paper setters: 1) No question should be asked on introductory part.			

Unit – II

Teacher should facilitate learning of basic about evaluation of determinant and partial derivative.

	Application to calculus of functions of several variables	Lecture required	Reference No.
a	Jacobian and its applications.(Definition of Jacobian, chain rule of Jacobian, Jacobian of implicit Function, functional dependence & independence).	03	3,7
b	Errors & approximations.(Problems related to engineering field)	03	3,7
c	Lagrange's method of undetermined multipliers for single constraint.	02	3,7
Guidelines to paper setters: 1) No question should be asked on introductory part. 2) There should no question on partial derivative.			

Unit – III

Teacher should facilitate learning of basic about co ordinate systems and integration.

Curve tracing and Fourier Series		Lecture required	Reference No.
	A] Curve Tracing		
a	Cartesian & polar curves.	03	5,6
	B] Fourier Series		
b	Full range Fourier series on $c \leq x \leq c + 2l$.	03	5,6
c	Half range Fourier series on $0 \leq x \leq l$.	02	5,6
Guidelines to paper setters: 1) No question should be asked on introductory part.			

UNIT-IV

Teacher should facilitate learning of basic about co ordinate system, graph of standard functions, straight line and integration.

Multiple Integrals and it's Applications		Lecture required	Reference No.
a	Introduction to three co-ordinate system.	01	4,5
b	Double Integration.(Cartesian form, polar form & change of order of integration).	03	4,5
c	Triple integration.	02	4,5
d	Application of multiple integrals to area & volume.	02	4,5
Guidelines to paper setters: 1) No question should be asked on introductory part.			

UNIT-V

Teacher should facilitate learning of basic about numerical methods.

Numerical solution of ordinary Differential equation (first order and first degree)		Lecture required	Reference No.
a	Numerical solution by Taylor's series method.	02	8,9
b	Runge -Kutta method (fourth order).	02	8,9
c	Picard's method	02	8,9
d	Modified Euler's method.	02	8,9
Guidelines to paper setters: 1) No question should be asked on introductory part. 2) Only short question should be asked.			

Reference Books:

1. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Ltd, 7th Edition.
2. C R Wylie and L C Barrett, "Advanced Engineering Mathematics", TMH 6th Edition.
3. B S Grewal, "Higher Engineering Mathematics", Khanna Publication.
4. H K Das, "Advanced Engineering Mathematics", S. Chand & Company.
5. B V Ramana , "Engineering mathematics", TMH,2nd Edition.
6. N P Bali, "A Text Book of Engineering Mathematics", Laxmi Publication, New Delhi.
7. Babu Ram, "Engineering Mathematics", Pearson Education.
8. S S Shastri , "Numerical Methods", Printice Hall of India.
9. Kandasamy , "Numerical Methods", S. Chand & Company.

Note: i) No question should be asked on introductory part.
    ii) Tutorial batch should be of 30 students.

Elements of Electrical and Electronics Engineering

Teacher, Paper setter and Examiner should follow the guidelines as given below.

Unit - I
Teacher should facilitate learning of Basic DC circuits, Network Theorems and its Application to resistive networks.

1.		DC Circuits	Lecture required	Reference No
	a	**Review of series and parallel circuits. (Numerical)** Series and Parallel combination of simple resistive circuits, calculation of equivalent resistance, current and voltage. Current and voltage divider rule.	01	01
	b	**Kirchhoff's current and voltage law and their applications. (Numerical)** Statements of Kirchhoff's current & voltage law, application of laws to DC resistive circuits for calculation of voltages, currents and power.	01	01
	c	**Loop analysis and nodal analysis. (Numerical)** Loop and Nodal Analysis for solution of DC resistive circuits for calculation of voltages and currents.	02	01
	d	**Source conversion.** Conversion of Voltage source into current source and vice versa.	01	01
	e	**Superposition, Thevenin's, Norton's and Maximum power transfer theorem. (Numerical)** Statements of Superposition, Thevenin's, Norton's and Maximum power transfer theorem. Application of above theorems for solution of DC resistive network.	03	01
	f	**Star / Delta and Delta / Star conversion. (Numerical)** Solution of complicated network simplified by replacing delta meshes by equivalent star systems and vice versa.	01	01

Unit - II
Teacher should facilitate learning of Basics of single phase and three phase AC supply.

1.		AC Circuits	Lecture required	Reference No
	a	**Generation of single phase A.C.** Equation of alternating voltage and current of single phase A.C.	01	02
	b	**Definitions and derivation.** RMS value, Average value, Form factor, Crest factor.		

		Phasor representation of AC quantities. (Numerical)		
	c	Voltage and current phasor diagram, and waveforms for AC through pure resistance, pure inductance, pure capacitance. Calculation of amplitude and phase angle. Concept of reactance.	02	02
	d	**RL, RC, RLC series/parallel circuits.** Concept of impedance, admittance, conductance, susceptance and their voltage / current phasor diagram for RL, RC, RLC series/parallel circuits.	03	02
	e	**Concept of**: Active, reactive, apparent power and power factor. **(Numerical on RL,RC,RLC series/parallel circuits)**		
	f	**Three Phase AC Circuits.** 3ϕ EMF generation and equation of an alternating quantity.	01	02
	g	**Three Phase Star and Delta relation. (Numerical)** Relation between voltage, current and power in Star connected and Delta connected load system with phasor diagrams.	02	

Unit – III

Teacher should facilitate learning of Basic of semiconductor Devices.

1.		Semiconductor Devices	Lecture required	Reference No
	a	**PN junction Diode (No mathematical Treatment)** Symbol, working and Forward - Reverse Characteristics of PN junction diode.		03
	b	**Application As Rectifier** **(No Derivations, No numerical)** Half wave, Full wave and Bridge rectifier. Only circuit diagram, working and waveforms. Comparison between them.	02	03
	c	**Zener Diode** Introduction to Zener diode, its symbol, working and characteristics. Comparison of zener diode and PN diode.	01	03
	d	**Transistor Configurations:** Introduction to basic concept of Transistor and its working. Transistor Configurations (CB, CE & CC), Circuit diagram, working, input and output characteristics. Comparison of CB , CE & CC.	03	03
	e	**Transistor specifications (Numerical)** Alpha, beta and gamma and their relation.		03
	f	**Working of transistor as a switch and CE amplifier.** Circuit diagram and wave form.	01	03

			Lecture required	Reference No
	g	**Transistor biasing – Voltage Divider Bias.** **(Simple Numerical on Voltage divider bias method)** Define biasing, List the biasing method. Voltage divider bias method analysis and Derivation of stability factor '**S**' only.	02	03

Unit – IV

Teacher should facilitate learning of D C Power Supplies, Transducers and Opamp

1.		**D C Power Supplies, Transducers and Opamp**	**Lecture required**	**Reference No**
	a	**D C power Supplies** Introduction to regulated DC Power supply with its block diagram. Difference between regulated and unregulated power supplies. Definition of line and load regulation.	01	04
	b	**Zener shunt and Transistor Series regulator**. Circuit diagram and working only. No mathematical treatment.	01	
	c	**Transducer** – Definition of active and passive transducer. Operating principle, applications and limitation of RTD, Thermistor, LVDT, Potentiometer and strain gauge transducers.	03	04
	d	**Operational Amplifier** Introduction to Op-Amp, Symbol, Its parameter with their definition (e.g Input bias current, input offset current, input offset voltage, CMRR, slew rate). Virtual ground concept. Application of Opamp (Inverting**,** Non-Inverting amplifier and as a comparator) with their circuit diagrams, wave forms and equations for output voltage.	03	04

Unit - V

Teacher should facilitate learning of Digital Electronics, Automation, Fuses, Earthing and Lamps

1.		**Digital Electronics, Automation Earthing, Fuses and Lamps**	**Lecture required**	**Reference No**
	a	**Definition of** : Generation of Integrated Circuits- SSI, MSI, LSI and VLSI.		
	b	**Logic gates -** AND, OR, NOT, NOR, NAND, X-OR, X- NOR their truth table. Concept of Universal gate. Draw digital circuit from given equation using basic gate and universal gate. and vice versa.	03	05
	c	**De-Morgan's theorem** Statement and proof of De-Morgan's theorem, Circuit and truth table of adder and subtrator.		
	d	**Microprocessor-8085 and Microcontroller 8051** Block diagram only.	01	05

e	**Earthing & Fuses** Plate earthing and pipe earthing, simple fuse and HRC fuse. List Safety precautions.	01	06
F	**Lamps** Incandescent lamp (filament), fluorescent tube, CFL lamp, sodium and mercury vapour lamp. Diagram, working, advantage &, disadvantages of each lamp.	03	06

Reference Books:

1. B L Theraja and A K Theraja, "A Text book of Electrical Technology- Vol-I", S Chand, 1st Edition, 2001

2. B L Theraja and A K Theraja, "A Text book of Electrical Technology- Vol-I", S Chand, 1st Edition, 2001

3. S Salivahanan, N Sureshkumar and A Vallavaraj, "Electronics Devices and Circuits", TMH, 2nd Edition, 2009

4. S Salivahanan, N Sureshkumar and A Vallavaraj, "Electronics Devices and Circuits", TMH, 2nd Edition, 2009

5. S Salivahanan, N Sureshkumar and A Vallavaraj, "Electronics Devices and Circuits", TMH, 2nd Edition, 2007

6. J B Gupta, " A Course in electrical Power ", S K kataria and Sons, 12th edition, 2002

Engineering Drawing & Elements of Mechanical Engineering

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit - I

1. Teacher should facilitate learning of

Use of Drawing instruments, Sheet layout, Types of lines used, Lettering, Numbering and Dimensioning and Scales, Planes of projection, quadrants and first angle & third angle method of projection and Principles of Orthographic projection.

1.		Introduction to Engineering Drawing	Lectures required	Ref No
	a	**Introduction to Engineering Drawing.** Significance and scope of Engineering Drawing, use of Drawing instruments, Sheet layout. Note for Paper Setters: No question is to be asked on this part.	01	01
	b	**Lines, Lettering, Numbering and Dimensioning.** Illustration of types of lines used, Lettering, Numbering, Dimensioning - aligned and unidirectional systems and Scales (with classroom illustrations). Note for Paper Setters: No question is to be asked on this part.	01	01
	c	**Methods of projection.** Planes of projection, Horizontal Plane, Vertical Plane, four quadrants and first angle & third angle method of projection (with classroom illustrations). Note for Paper Setters: No question is to be asked on this part.	02	01
	d	**Orthographic projection.** Principles of Orthographic projection, Projection of a point in different quadrants. (With solved examples.) Note for Paper Setters: No question is to be asked on this part.	02	01
	e	**Projection of straight line and plane** Projection of straight line and plane in 1st quadrant strictly INCLINED TO ONE PLANE only. (With solved examples.) Note for Paper Setters: Only numerical question are to be asked on **1.e projection of lines and planes** using first angle method of projection inclined to one plane only. No theory question is to be asked.	03	01

Unit - II

1. Teacher should facilitate learning of

Basics of Orthographic Projection

2.		**Orthographic Projection**	**Lectures required**	**Ref No**
	a	**Introduction to Orthographic Projection.** To draw front view, Top View and side View of Simple objects in different positions using both 1st angle method and 3rd angle method. (With solved examples.) Note for Paper Setters: No question is to be asked on this part.	03	01
	b	Orthographic projection with different sections (Full section, half section, revolved section, offset section, etc). (With solved examples.) Note for Paper Setters: Numerical is to be asked on **2.b Orthographic projection with different sections** using both 1st angle method and 3rd angle method. No theory question is to be asked.	03	01
	c	Conversion of simple views into orthographic views. (With solved examples.) Note for Paper Setters: No question is to be asked on **2.c Conversion of simple views into orthographic views** using both 1st angle method and 3rd angle method. No theory question is to be asked.	03	01

Unit – III

1. Teacher should facilitate learning of

Basics of isometric Projection

3.		**Isometric projection**	**Lectures required**	**Ref No**
	a	**Introduction to Isometric projection** Isometric axes, lines and planes; true scale and isometric scale. (With simple illustrations.) Note for Paper Setters: No question is to be asked on this part.	03	01
	b	**Isometric projection & Isometric view** Isometric projection and isometric view of given objects. (With solved examples.) Note for Paper Setters: Numerical is to be asked on **3.b Isometric projection and isometric view of given objects**. No theory question is to be asked.	03	01
	c	Conversion of given orthographic view into isometric view. (With solved examples.)	03	01

		Note for Paper Setters: Numerical is to be asked on **3.c Conversion of given orthographic view into isometric view**. No theory question is to be asked.		

Unit – IV

1. Teacher should facilitate learning of Energy, energy management & audit and Renewable energy sources.

[Theoretical study with simple line diagrams, no numerical treatment. Use of working models, charts and multimedia is encouraged.]

4.		**Energy**	**Lectures required**	**Ref No**
	a	**Energy** Energy, energy and mass conservation laws, Different forms of energy, Heat Transfer, Work Transfer and it forms Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	02	02
				03
	b	**Energy Audit** Energy management strategy, energy audit: types and methodology, energy audit reporting format. Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	02	04
	c	**Energy producing devices** Heat Engines such as I. C. Engine (2S and 4S Engines, Diesel and Petrol engines) Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	02	02
	d	**Energy producing devices** Steam Power Plant, hydroelectric power plant, water turbine Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	02	02
	e	**Energy producing devices** Nuclear power plant, gas turbine power plant.	01	02

		Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.		

Unit - V

1. Teacher should facilitate learning of Energy absorbing devices and Mechanical devices.

   [Theoretical study with simple line diagrams, no numerical treatment. Use of working models, charts and multimedia is encouraged.]

5.		Energy absorbing devices and Mechanical devices	Lectures required	Ref No
	a	**Energy absorbing devices** Reciprocating air compressor, rotary compressor, blower, air motors, household refrigerator and window air conditioner. Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	03	02 / 06
	b	**Mechanical devices** **Elements:** power transmission shafts, axles, keys, couplings, bearings. Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	01	10
	C	**Drives**: types of drives, belt drive, rope drive, chain drive, gear drive and friction clutches. Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	02	06
	D	**Valves**: Various types of Pressure, Direction & Flow control valves & their applications, On-off valves, flow control valves, non return valve, pressure regulating valve, throttle valve, butterfly valve, and solenoid operated valve. Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.	01	07
	E	Types of Actuators, pumps, Simple Hydraulic power unit and Pneumatic power unit. Applications, advantages and disadvantages of Hydraulic and Pneumatic systems.	02	07

		Note for Paper Setters: Questions are to be asked on **elementary Theoretical study using simple line diagrams**. No numerical is to be asked.		

Reference Books:

1. Bhatt N D, Panchal V M, "Engineering Drawing – Plane and Solid Geometry", Charotar Publishing House, Anand.
2. Rajan T S, "Basic Mechanical Engineering", New Age International Pvt. Ltd, New Delhi.
3. Rai G D, "Non Conventional Sources of Energy", Khanna Publication, New Delhi.
4. Khan B H, "Non Conventional Energy Resources", Tata McGraw Hill, New Delhi.
5. Nag P K, "Engineering Thermodynamics", McGraw Hill.
6. Rattan S S, "Theory of Machines", McGraw Hill.
7. David G. Alciatore, Michael B Histand, "Introduction to Mechatronics and Measurement systems", McGraw-Hill, 2003

Other Reference Books:

8. T Jeyapoovan, "Engineering Drawing and Graphics Using Autocad", Vikas Publication Noida, New Delhi.
9. Kannaiah K L, Narayana, "Engineering Graphics", Scitech Publications, Chennai, 2nd. Edition.
10. H G Phakatkar, "Engineering Graphics", Nirali Publication, Pune.
11. Thomas Beven, "Theory of Machines", Pearson.
12. H L Stewart, "Hydraulics and Pneumatics Power for Production", Industrial Press Inc. N.Y. USA, 2001.

Engineering Physics – II
(Engineering Science Lab-II)

Teacher should facilitate learning following lab experiments:

Sr. No	Name of Experiment	Lab hours/week (Alternate Week With EC-II)
1	**Sound Level Meter** Measurement of sound pressure in decibel. To study the use of sound level meter.	02
2	**Ultrasonic Interferometer.** Determination of velocity of ultrasonic wave in water. Study the properties of ultrasonic waves and its application. Compare analytical and practical values.	02
3	**Ultrasonic Detector** Determination of distance, wavelength and velocity of ultrasonic wave. Study the production of ultrasonic wave. Compare analytical and practical values.	02
4	**e/m by Thomson's method.** Determination of specific charge of electron by using Thomson's method. To study motion of electron in electric field. Compare analytical and practical values.	02
5	**To Study B-H curve** To study and draw hysteresis curve using solenoid method. Describe remanance and coercive force from hysteresis curve.	02
6	**Determination of magnetic susceptibility.** Determination of magnetic susceptibility of given solution. To study the properties of magnetic materials and its applications To study working of electromagnet to produce magnetic field.	02
7	**Uses of CRO** To study working of CRO. Use of CRO to find frequency and amplitude. Compare analytical and practical values.	02
8	**Synthesis and Characterization of Nano Composites** Synthesis and characterization of metal nanoparticle like ZnO, CdP ,Fe,Ag or Core shell by electrochemical reduction process/ultrasonic cavitation/microwave/sol-gel technique at room temperature Size of metal nanoparticles can be calculated from XRD and Shearer's formula. shape & exact size of metal nanoparticles can be confirmed using Transmission Electron Microscope (TEM).	02

Note: Lab journal should consist of minimum five experiments.

Reference Books:

1. M N Avadhanulu, A A Dani, & P M Pokley, "Experiments in Engineering Physics".S.Chand
2. S P Singh, "Advanced Practical Physics".Pragati Prakashan.
3. S K Kulkarni, "Nanotechnology, Principles & Practices".Capital Publication Co.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Engineering Chemistry - II
(Engineering Science Lab-II)

Teacher should facilitate learning following lab experiments:

Sr. No.	Experiment	Lab hours per week (alternate with EP-II)
1	**Determination of partition Coefficient of Iodine between water & CCl_4.** Preparation of different composition of saturated Iodine solution in CCl_4. Separation of Aqueous and CCl_4 layer from each bottle. Titration of Aqueous layer against N/100 Sodium Thiosulphate solution. Titration of CCl_4 layer against N/20 Sodium Thiosulphate solution. Calculation of Iodine in both the layers.	2
2	**Determination of saponification value of an oil.** Preparation of std. KOH solution. Standardisation of Std. KOH solution against 0.5N HCL solution using Phenolphthalein indicator. Add KOH solution in 2 gm of Oil sample and reflux for 2 hours. Titrate the above solution against 0.5N HCL solution using Phenolphthalein indicator. Using two titrate values calculate the saponification number.	2
3	**Determination of Viscosity by Ostwald's Viscometer.** Find out the density of given liquid by using specific gravity bottle. Measure the flow time required for liquid and water by using Ostwald's Viscometer. Calculate the relative viscosity from the above observed values.	2
4	**Determination of Calorific value of fuel sample by using Bomb calorimeter.** Burn the known mass of solid fuel in Bomb pot. Observe the temperature difference of water in bomb pot. Calculate the actual and corrected calorific value of solid fuel sample from above observations.	2
5	**Determination of Moisture, Volatile matter & Ash in a given sample of Coal (Proximate analysis).** Determine and calculate the moisture content from the given coal sample. Determine and calculate the Volatile matter from the given coal sample. Determine and calculate the Ash content from the given coal sample. Determine and calculate the Fixed Carbon from the given coal sample.	2
6	**Determination of pH using pH meter.** Calibrate the pH-meter using buffer solution at room temperature. Measure the pH-values of given solutions. From the measured pH-values of solution, conclude which are acidic or basic solutions.	2

Sr. No.	Experiment	Lab hours per week (alternate with EP-II)
7	**Acid Value of vegetable Oil sample.** Add neutral alcoholic solution in given Oil sample and heat in water bath for 30 minutes. Titrate above solution against 0.1N KOH solution using phenolphthalein indicator. Calculate the acid value of given Vegetable Oil sample from above observations.	2
8	**Determination of $NaHCO_3$ & Na_2CO_3 in given alkali mixture.** Titration of alkali mixture solution against 0.1N HCl using methyl orange indicator. Titration of alkali mixture solution against 0.1N HCl using phenolphthalein indicator. Calculate the strength of $NaHCO_3$ and NA_2CO_3 from the above observed titrate values.	2
9	**Determination of Aniline point of lubricating oil.** Mixed Aniline and lubricating oil sample in Aniline point apparatus. Maintain the apparatus at constant temperature using water bath. Observe the temperature at which cloudiness and hazy appearance in the solution. Report the observed values as Aniline point.	2
10	**Determination of Iodine value of an Oil sample (Wij's method).** Back Titration: Dissolve the given oil sample in CCl_4 solution then add Wij's solution. Titrate the above solution against std. 0.1N Sodium Thiosulphate solution. Blank Titration: In Wij's solution add KI solution and titrate it against 0.1N sodium Thiosulphate solution. Calculate the Iodine value of an oil sample from above observed titrate values.	2

Note: Lab journal should consist of minimum five experiments.

Reference Books:

1. Shashi Chawla, "Essentials of Experimental Engineering Chemistry" ,Dhanpat Rai Publishing Company.
2. Sudha Rani, "Laboratory Manual on Engineering Chemistry" , Dhanpat Rai Publishing Company.

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Engineering Drawing & Elements of Mechanical Engineering Lab

Teacher and Examiner should follow the following guidelines.

1. Teacher should facilitate following lab experiments:

	Engineering Drawing Lab	Lab hours required
1	**Sheet No. 01 - Lines, Lettering and methods of dimensioning.** Illustration of lettering, numbering, types of lines. Sketch of symbols for 1st and 3rd angle method of projection. Illustration with a simple drawing with at least 2 views to show uses of line types and methods of dimensioning.	04
2	**Sheet No. 02 – Projection of lines and planes.** Illustration of projection of straight line in 1st quadrant strictly INCLINED TO ONE PLANE only. [Minimum 02 solved examples] Illustration of projection of plane in 1st quadrant strictly INCLINED TO ONE PLANE only. [Minimum 02 solved examples]	04
3	**Sheet No. 03 – Orthographic Projection.** Illustration of simple orthographic projection using both 1st angle and 3rd angle method. [Minimum 02 solved examples] Illustration of sectional orthographic projection using both 1st angle and 3rd angle method.[Minimum 02 solved examples]	04
4	**Sheet No. 04 – Isometric Projection** Illustration of Isometric projection with natural scale. [Minimum 02 solved examples] Illustration of Isometric projection with isometric scale. [Minimum 02 solved examples]	04
5	**Sheet No. 05 – freehand sketches of Machine elements.** Free hand sketches of machine elements including screw threads, screwed fasteners, nuts, bolts, riveted and welded joints, Keys, shaft, couplings. (With constructional details.) Introduction to limits, fits and tolerance.	04
6	**Demonstration and Study of Cochran and Lancashire boiler.** Study the principle, construction and working of Cochran boiler. Demonstrate construction and working of Cochran boiler using chart/model/multimedia. Study the principle, construction and working of Lancashire boiler. Demonstrate construction and working of Cochran boiler using chart/model/multimedia. Discuss relative merits and demerits.	02

		Elements of Mechanical Engineering Lab	Lab hours required
	7	**Demonstration and Study of Babcock and Wilcox boiler.** Study the principle, construction and working of Babcock and Wilcox boiler. Demonstrate construction and working of Babcock and Wilcox boiler using chart/model/multimedia. Discuss relative merits and demerits with fire tube boilers.	02
	8	**Demonstration and Study of boiler mountings.** Study the principle, construction and working of various boiler mountings. Demonstrate various boiler mountings using chart/model/multimedia.	02
	9	**Demonstration and Study of boiler accessories.** Study the principle, construction and working of various boiler accessories. Demonstrate various boiler mountings using chart/model/multimedia.	02
	10	**Demonstration and Study of power transmission - Single plate clutch, Oldham coupling, Hook's Joint.** Study the principle, construction and working of Single plate clutch, Oldham coupling, Hook's Joint. Demonstrate various Single plate clutch, Oldham coupling, and Hook's Joint using chart/model/multimedia	02
	11	**Measurement of energy consumption of domestic appliances.** Measurement of energy consumed in kWh for simple household appliances using simple measurement techniques. Students will conduct such measurement at home and submit a case study.	02
	12	**Measurement of thermal efficiency of domestic cooking devices.** Measurement of energy consumed and thermal efficiency of simple household appliances using simple measurement techniques. Students will conduct such measurement at home and submit a case study.	02

Note: Lab file should consists of FIVE experiments from each Engineering Drawing Lab and Elements of Mechanical Engineering Lab .

Reference Books:

1. Bhatt N D, Panchal V M, "Engineering Drawing – Plane and Solid Geometry", Charotar Publishing House.
2. Rajan T S, "Basic Mechanical Engineering", New Age International Pvt. Ltd, New Delhi.
3. T Jeyapoovan, "Engineering Drawing and Graphics Using Autocad", Vikas Publication Noida, New Delhi.
4. Kannaiah K L, Narayana, "Engineering Graphics", Scitech Publications, Chennai, 2nd Edition
5. H G Phakatkar, "Engineering Graphics", Nirali Publication, Pune.
6. Nag P K, "Engineering Thermodynamics", McGraw Hill.
7. Thomas Beven, "Theory of Machines", Pearson.
8. Rattan S S, "Theory of Machines", McGraw Hill.
9. Khan B H, "Non Conventional Energy Resources", Tata McGraw Hill, New Delhi.
10. Rai G D, "Non Conventional Sources of Energy", Khanna Publication, New Delhi.
11. David G Alciatore, Michael Histand, "Introduction to Mechatronics and Measurement Systems", McGraw-Hill, 2003
12. H L Stewart, "Hydraulics and Pneumatics Power for Production", Industrial Press Inc. N.Y. USA, 2001

Guide lines for ICA:

ICA shall be based on continuous evaluation of student performance throughout semester and practical assignment submitted by the student in the form of journal.

Guide lines for ESE:

ESE will be based on practical assignments submitted by the student in the form of journal. Evaluation will be based on paper work.

Elements of Electrical and Electronics Engineering Lab

Teacher should facilitate learning following lab experiments:

		Group-A	Lab hours required
	1	**Verification of Kirchhoff s law.** Verification of Current and voltage law using simple resistive network. Measurement of various node voltage and branch current and comparison of practical and analytical values.	02
	2	**Study of RLC series circuit.** Measuring voltages and currents of series RLC circuit (V_R, V_L, V_C, I). Calculation of impedance, inductance, capacitance and power factor of circuit.	02
	3	**Verification of Superposition Theorem** Verification of superposition theorem using simple resistive network. Compare the analytical and experimental values of the currents obtained using superposition theorem.	02
	4	**Verification of Thevenin's Theorem** Find the open circuit voltage, equivalent resistance and load current in network theoretically and Compare the analytical and practical values of the voltages and currents obtained using Thevenin's theorem.	02
	5	**Study of lamps** Describe operation and construction of filament lamp, Mercury vapor lamp, fluorescent tube, Sodium vapor lamp, CFL lamp. Instructor should demonstrate lamps in lab.	02
	6	**Study of Earthing** Describe the types of Earthing and need of Earthing. Describe Fuse, safety precaution while working with electricity.	02
		Group-B	Lab hours required
	1	**Study and testing of electronics components and their terminals.** Identify the values of resistance, inductance, capacitor (mica, electrolyte etc) and identify the terminals of diode and transistor. Testing of resistance, inductance, capacitor (mica, electrolyte etc) diode, and transistor using multi meter.	02
	2	**Displacement measurement using LVDT.** Use of displacement transducer in automation. LVDT construction and working, Measurement of displacement (setup). Find out the output voltage.	02

	3	**Study of Half wave, full wave and bridge rectifier.** Observe input- output voltage waveforms for half wave, full wave and bridge rectifier and measure output DC voltage. Compare all three types.	02
	4	**Implementation of inverting and non inverting amplifier using Op-Amp.** Circuit diagram for use of Operational Amplifier as Inverting and non inverting amplifier. Analyze and plot Input and output waveforms. Find gain of amplifier and verify with theoretical value.	02
	5	**Input Output Characteristics curve for CE configuration of transistor.** Transistor in CE configuration, Analyze and plot Input Output Characteristics curve for CE configuration.	02
	6	**Implementation of simple Boolean expression using logic gates.** Simplification of any Boolean expression, Implement same expression using i) Basic gate. ii) Universal gates only.	02

Note: Lab file should consist of minimum FOUR experiments from each group.

Guide lines for ICA:

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Guide lines for ESE:

ESE will be based on practical assignment submitted by the student in the form of journal. In ESE the student may be asked to perform any one practical out of Group A and Group B. Evaluation will be based on paper work and performance in the practical.

Reference Books:

1. B L Theraja and A K Theraja, "A Text book of Electrical Technology- Vol-I", S Chand, 1st Edition, 2001
2. S Salivahanan, N Sureshkumar and A Vallavaraj, "Electronics Devices and Circuits", TMH, 2nd Edition, 2009
3. R S Sedha, "Applied Electronics", S Chand, 1st Edition, 2005
4. H S Kalsi, " Electronic Instrumentaion", TMH, 2nd Edition, 2007
5. R A Gaikwad, "Op-Amps and Linear Integrated Circuits", PHI, 4th edition, 2001
6. R P Jain, "Modern Digital Electronics", TMH, 4th Edition, 2010
7. R S Gaonkar, "Microprocessor Architecture, Programming and Application with the 8085", Penram International, 4th Edition, 2000
8. S K Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Education, 1st Edition, 2012
9. J B Gupta, " A Course in electrical Power ", S K kataria and Sons, 12th Edition, 2002

Workshop Practice- II

Teacher and Examiner should follow the following guidelines.
1. Teacher should facilitate following lab experiments:

		Workshop Practice II	Lab hours required
	1	**Carpentry shop** Introduction to carpentry operations, equipment and tools. One job involves lap joint, bridle joint**.**	04
	2	**Plumbling shop** Introduction to the tools and equipments like pipe vice, pipe bending machine, pipe dies, cutting dies, pipe wrench etc. used for plumbing operations on G.I. pipe. One Job having both side threading and like bending operations.	04
	3	**Machine shop** One job on lathe machine involving operations like Facing, plain turning, step turning, taper turning, chamfering and drilling.	06
	4	**Electronics workshop** Types of PCB, PCB making, soldering, testing of electronic component like diode, transistor, R.L.C. etc and desoldering of a simple electronic circuit; probe making; one job on above, Use of multimeter (each function).	04
	5	**Electrical workshop** Introduction and Difference between 1 Φ AC, DC, Transformers, Repair and maintenance of domestic appliances like electric fan, tube light etc. MCB, ELCB; Different types of wiring, one job on preparation of extension boards, tube light wiring etc; demonstration of earthing and neutral.	04

Note:
1. Candidates are required to finish the job to the following limits
   Machine Shop: + 0.5mm -0.5mm
   Carpentry: +2mm -2mm
2. Workshop book to be submitted comprising of Job drawing, process sheet for a given job along with the sketches of tools used for operations.
3. No separate journal or file is to be prepared.

Reference Books:
1. Hajara Chaudhary and Bose S K, "Element of Workshop Technology Volume I and II", Asia Publishing House.
2. P N Rao, "Production Technology Volume I and II", Tata McGraw Hill Publication.
3. R K Jain, "Production Technology", Khanna Publications.
4. P C Sharma, "Production Technology", Khanna Publication.
5. Chapman W A J., "Workshop Technology", ELBS Publication.

6. HMT, "Production Technology", Tata McGraw Hill Publication.
7. Kannaiah K L, Narayana, "Workshop Manual", Scitech Publications, Chennai, 2nd Edition.

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Soft Skills- II

Teacher, Paper setter and Examiner should follow the following guidelines.

Unit - I
1. Teacher should facilitate learning of
      Grammar, Error Identification, Sentences

1.		Unit I: Eloquent Writing - II	Lect. required	Practical	Ref No
	a	**Chapter 1:** Understanding Adverbs, Voices and Speeches 1.1 Adjectives and Adverb 1.2 Active and Passive Voices 1.3 Direct and Indirect Speeches 1.4 Summary 1.5 Activities	01	02	01
	b	**Chapter 2**: Sentence Completion 2.1 Strategies for Effective and Easy Completion of Sentences 2.2 General Types of Questions 2.3 Summary 2.4 Activities	01	02	01
	c	**Chapter 3:** Sentence Correction 3.1 Strategies for Effective and Easy Completion of Sentences 3.2 General Types of Questions 3.3 Summary 3.4 Activities	01	02	01

Unit - II
1. Teacher should facilitate learning of
Writing skills, Business communication

2.		Corporate Communication	Lect. required	Practical	Ref No
	a	**Chapter 4:** Corporate Letters 4.1 Business Letters 4.2 Drafting and Formatting 4.3 Letter of Transmittal 4.4 Summary 4.5 Activities	01	02	02
	b	**Chapter 5:** Resume and Curriculum Vitae Writing 5.1 Difference Between Resume and CV 5.2 Drafting 5.3 Things to be Included 5.4 Fonts, Text and Colours 5.5 Summary 5.6 Activities	01	02	02

			Lect. required	Practical	Ref No
c	**Chapter 6:** Writing Reports 6.1 Kinds of Reports 6.2 Common Features 6.3 Routine Reports 6.4 Non-Routine Reports 6.5 Summary 6.6 Activities		01	02	02

Unit – III

Teacher should facilitate learning of group discussions

3.		Discussions and Debates	Lect. required	Practical	Ref No
	a	**Chapter 7:** Basics of a Group Discussion 7.1 Concept 7.2 Methodology 7.3 Components and Roles 7.4 Success in Group Discussions 7.5 Positive and Negative Traits 7.6 Dos and Don'ts of a Group Discussion 7.7 Summary 7.8 Activities	01	02	03 04
	b	**Chapter 8:** Group Discussion Models 8.1 Corporate/Leadership Model 8.2 GOI/Communist Model 8.3 Evaluation Techniques 8.4 Evaluation Sheet 8.5 Summary 8.6 Activities	01	02	03
	c	**Chapter 9**: Debates – Value and Process 9.1 The Value of Debate 9.2 Understanding the Process 9.3 Case Building 9.4 Research and Reasoning 9.5 Refutation 9.6 The Ideal Debate Speaker 9.7 Summary 9.8 Activities	01	02	05

Unit – IV

Teacher should facilitate learning of interview handling skills and etiquette

4.		Successful Interviews	Lect. required	Practical	Ref No
	a	**Chapter 10:** Pre-Interview Strategies 10.1 Do Your Homework 10.2 Mastering E-mail Etiquette 10.3 Perfect Resume and Cover Letter 10.4 Initial Phone Call	01	02	09 07

			Lect. required	Practical	Ref No
		10.5 Dressing for the Occasion 10.6 Know that Most Companies Have Bias 10.7 Summary			06
	b	**Chapter 11:** Strategies During the Interview 11.1 The Three Basic Rules 11.2 Reading the Interviewer's Style 11.3 Understanding the Real Question 11.4 The Tell Me About Yourself Question 11.5 Expect Trick Questions 11.6 40 Sure Shot Questions 11.7 Salvage a Bad Interview 11.8 Summary 11.9 Activities	01	02	07 08
	c	**Chapter 12:** Strategies After the Interview 12.1 Write a Thank You Note 12.2 Pay Attention to Details 12.3 Talk to Your References 12.4 Negotiate the Offer 12.5 Activities	01	02	08

Unit - V

Teacher should facilitate learning of qualities of a leader and a successful team player

5.		Leadership and Team building	Lect. required	Practical	Ref No
	a	**Chapter 13:** Laws of Successful Leadership 13.1 Habits of an Effective Leader 13.2 The Leader's Core Responsibility 13.3 Leadership Functions in Teambuilding 13.4 Summary 13.5 Activities	01	02	10
	b	**Chapter 14:** Becoming a Motivator 14.1 Eight Rules in Motivating People 14.2 Maslow's Hierarchy of Needs 14.3 McGregor's Theory X and Theory Y 14.4 Herzberg's Motivation – Hygiene Theory 14.5 Summary 14.6 Activities	01	02	11
	c	**Chapter 15:** Principles of Team-workmanship 15.1 Understanding Teams and Their Structures 15.2 Team Roles and Team Member Functions 15.3 The Individual Within the Team 15.4 Selecting the Team Members 15.5 Maintaining Your Team 15.6 Summary 15.7 Activities	01	02	11

Reference Books:

1. Barron's TOEFL Guide, Galgotia Publications.
2. Diana Booher, "E-Writing", Macmillan India Publisher.
3. Prasad and Mohan, "How to prepare for Group Discussion and Interview", Tata McGraw Hill Publications.
4. Mandal S K, "How to succeed in group discussions and personal interviews" ,aico Publishing House.
5. Richard Edwards, "Competitive Debate: The Official Guide", Penguin Group.
6. Prasad and Mohan, "How to prepare for Group Discussion and Interview", Tata McGraw Hill Publications.
7. Mandal S K, "How to succeed in group discussions and personal interviews", Jaico Publishing House.
8. Raghu Palat, "Interview tips", Jaico Publishing House.
9. Diana Booher, "E-Writing", Macmillan India Publisher.
10. Blanchard, Hybels and Hodges, "Leadership by the Book", Harper Collins.

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