

COURSE ID: 01

Course Name : ENGINEERING PHYSICS (EE/IE/IF/ET)
Course Code : CCE102
Course Abbreviation : EPHB

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : Nil
Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	04	06
Practical	02	

Evaluation Scheme :

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i.25 marks for each practical ii.One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma -II	
Marks	20	--	80	--	50	150

RATIONALE:

Physics is the foundation of engineering and technology. The development of all engineering areas requires good understanding of fundamental principles in physics. Studying physics develops scientific methodology and technical aptitude in the students. Applications of principles of physics in engineering fields create interest and motivate the students.

OBJECTIVES :

The student will be able:

1. To state the principles and laws of physics
2. To apply principles studied to simple practical problems / situations.
3. To develop skills of working in team, handling of instruments, apparatus and tools.
4. To develop curiosity, interest and self-confidence.
5. To develop cognitive abilities like observing, classifying, interpreting.

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
4	WAVE MOTION 4.1 Definitions of periodic motion, Linear S. H. M. 4.2 Parameters of linear SHM : Amplitudes, Period, Frequency and Phase 4.3 Concept and definition of wave 4.4 Parameters of wave- Frequency, periodic time, phase and wavelength 4.5 Types of waves (transverse and longitudinal) and their characteristics 4.6 Relation between velocity of wave, wavelength, frequency ($v = n \lambda$) 4.7 Free and forced oscillations 4.8 Phenomenon of resonance and its applications	08	10
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Section II

Sr. No.	Topics / Subtopics	Lectures (Hours)	Theory Evaluation (Marks)
5	CURRENT ELECTRICITY 5.1 Concept of electric current , resistance 5.2 Ohm's law, Specific resistance, Resistivity 5.3 Resistances in series and parallel. 5.4 Wheatstone's Network and meter Bridge. 5.5 Principle of potentiometer 5.6 Numerical problems	06	08
6	MODERN PHYSICS 6.1 PHOTO ELECTRIC EFFECT 6.1.1 Plank's hypothesis 6.1.2 Photon and its characteristics 6.1.3 Photo electric effect and its characteristics 6.1.4 Plank-Einstein equation 6.1.5 Photocell – construction and symbol 6.1.6 Applications of photo electric effect 6.1.7 Numerical Problems 6.2 LASER 6.2.1 Introduction of LASER	16	18

	6.2.2 Properties of laser 6.2.3 Spontaneous and stimulated emission 6.2.4 Population inversion and optical pumping 6.2.5 Applications of LASER 6.3 X-RAYS 6.3.1 Nature and properties of x-rays. 6.3.2 Production of x-rays by Coolidge tube 6.3.3 Applications of x-rays		
7	FIBER OPTICS 7.1 Optical communication link 7.2 Principle of optical fiber (TIR) 7.3 Structure of optical fiber 7.4 Propagation of light in optical fiber 7.5 Advantages of optical fibers over conventional metal conductors 7.6 Applications of optical fibers	06	08
8	NANOTECHNOLOGY 8.1 Definition of nanoscale, nanometer, nanoparticle 8.2 Definition and examples of nanostructured materials 8.3 Applications of nanotechnology in electronics, automobile, textile, space, medicine, cosmetics and environment	04	06
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination :

Section / Topic no.	Name of topic	Distribution of marks			Total marks
		Knowledge	Comprehension	Application	
I/1	Properties of light	2	2	4	08
I/2	Elasticity	2	4	2	08
I/3	Properties of liquids	4	8	2	14
I/4	Wave motion	4	6		10
II/5	Current electricity	2	2	4	08
II/6	Modern Physics	4	10	4	18
II/7	Fiber optics	2	4	2	08
II/8	Nanotechnology	2	4		06
	Total	22	40	18	80

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

B) TERM WORK Term work shall consist of the following :

Laboratory experiments and related skills to be developed :

Sr. No.	Title of Experiment	Skills to be developed
1	Overview of Field Applications of Physics	i) Information search ii) Information presentation
(Any 08 of the following experiments)		
2	To measure dimensions of given objects by using Vernier Caliper	i) Determine least count and zero error in the measuring instrument. ii) Measuring internal and external dimensions of given objects iii) Handling the measuring instruments for measuring depth, thickness etc. iv) Tabulating observations.
3	To measure the diameter of bob and thickness of plate by using Micrometer screw gauge	i) Determine least count and zero error in the measuring instrument. ii) Measuring dimensions of given objects iii) Handling the measuring instruments for measuring depth, thickness etc. iv) Tabulating observations.
4	To determine the viscosity of liquid by Stokes method.	i) Measuring diameter of steel ball using micrometer screw gauge. ii) Measuring terminal velocity of steel ball in the liquid column. iii) Use of stop watch for measurement of time. iv) Tabulating observations.
5	To determine the surface tension of liquid by capillary rise method	i) Focusing the microscope properly in order to get clear image. ii) Adjusting cross wires of microscope at particular place. iii) Taking readings for main scale and Vernier scale of traveling microscope. iv) Tabulating observations.
6	To measure unknown resistance of wire by Ammeter – Voltmeter method.	i) Drawing the circuit diagram of the required experiment. ii) Connecting the instruments as per circuit diagram. iii) Measuring the value of potential difference & current in the circuit. iv) Tabulating observations.
7	To verify Snell's law using glass slab	i) Drawing necessary ray diagram ii) Measuring angles of incidence and refraction iii) Tabulating observations.
8	To determine refractive index of prism by pin	i) Removing parallax between the images and the pins by observing the refracted ray through a prism. ii) Measuring the angle of refraction correctly iii) Drawing the path of refracted ray through the prism

	method	iv) Drawing inference regarding relation between angle of incidence & angle refraction from $i-\delta$ graph v) Tabulating observations.
9	To determine velocity of sound by resonance tube	i) Adjusting the resonating length by discriminating resonating sound from sound produced by the tuning fork. ii) Measuring internal diameter of resonating tube using vernier caliper iii) Drawing inference & confirming Law $nL = \text{constant}$ iv) Tabulating observations.
10	To study characteristics of photocell	i) Drawing circuit diagram ii) Handling different delicate instruments. iii) Tabulating observations iv) Drawing graph
11	To determine the acceleration due to gravity by 'g' by simple pendulum	i) Measuring length of pendulum ii) Finding least count of stopwatch iii) Measuring periodic time with the help of stop watch iv) Tabulating observations.
12	To measure unknown resistance by Wheatstone's meter bridge.	i) Drawing the circuit diagram for series connections of the resistances. ii) Connecting the resistances for series method as per circuit diagram. iii) Finding the correct position of null point & measuring correct balancing lengths on Meter bridge. iv) Tabulating observations.

C) INDUSTRIAL EXPOSURE

Sr. No.	Mode of Exposure (Visit/Exp.Lect/Ind.Survey/...)	Topic
1.	Field applications in theory lectures in every topic	All topics in course syllabus
2.	Practical exercise on overview of field applications of Physics	Part of term work

Report of each Industrial Exposure Activity shall be submitted by student as a part of term work for evaluation.

ASSESSMENT CRITERIA FOR TERM WORK AND PRACTICAL EXAMINATION

a) Assessment Criteria for Term work :

i) Continuous Assessment of Practical Assignments :

Every practical assignment shall be assessed for 25 marks as per given criteria .

ii) Progressive Skill Test :

One mid-term Progressive Skill Test of 25 marks shall be conducted as per criteria given below

Criteria for Continuous Assessment of Practical work and Progressive skill Test :

Sr. No.	Criteria	Marks allotted
1	Neat & complete circuit Diagram / schematic Diagram.	05
2	Observations & Result Table	05
3	Sample Calculations with relevant Formulae.	05
4	Proper Graphs & Procedure / workmanship Safety measures	05
5	Oral Based on Term Work	05
	Total	25

b) Criteria for assessment at semester end practical exam :

Every student has to perform one practical within 2 hours at semester end practical exam which shall be assessed as per following criteria.

Sr. no	Criteria	Marks allotted
1	Preparedness for practical	10
2	Correct figures / diagrams	10
3	Observation tables	10
4	Result table / calculations / graphs	10
5	Safety / use of proper tools	10
	Total	50

INSTRUCTIONAL STRATEGIES :

Instructional Methods :

1. Lectures cum Discussions
2. Regular Home Assignments.
3. Laboratory work

Teaching and Learning resources:

1. Chalk board
2. Video clips
3. Slides
4. Item Bank
5. Charts

REFERENCE MATERIAL :

a) Books / Codes

Sr. No.	Author	Title	Publisher
1	B.G. Bhandarkar	Applied Physics	Nirali publications
2	Manikpure – Deshpande	Applied Physics	S. Chand publications
3	Narkhede, Pawar, Sutar	Applied Science	Nirali publications
4	Shelake, Shinde, Adwankar	Applied Science	Vision publications
5	B.L. Theraja	Engineering Physics	S. Chand Publishers – New Delhi
6	Beiser	Concept of modern physics	Tata Mc-Graw Hill
7	E. Zebro Wski	Physics for Technicians	Tata Mc-Graw Hill
8	V. Rajendran	Engineering Physics	Tata McGraw-Hill Publications

b) Websites

- ✓ <http://www.physicsclassroom.com>
- ✓ <http://scienceworld.wolfram.com/physics/>
- ✓ <http://physics.about.com/>

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COURSE ID: 02

Course Name : ENGINEERING CHEMISTRY-EE/IE/IT/ET
Course Code : CCE104
Course Abbreviation : ECHB

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : <NIL>

Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	04	06
Practical	02	

Evaluation Scheme :

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i. 25 marks for each practical ii. One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma -II	
Marks	20	--	80	--	50	150

RATIONALE :

Engineering chemistry deals with the study of structure, composition and Properties of the materials, which form the core of the fundamental sciences. Many Processes are based on principles of Chemistry in various industries such as- Sterilization in City water supply. Lubricants in different machines. Corrosion and protection of metals, Copper is the most widely used metal in electronics & electrical engineering fields. Hence the study of its occurrence, extraction, refining & alloying is important to an engineer.

Engineering materials like Steels, Thermocole, Glass wool, Adhesive, Dielectrics ,Ceramics, Semiconductors are the backbone of various industries, machines, equipment, & processes

Hence the knowledge of chemistry is essential to the aspiring engineers of all branches in their field.

OBJECTIVES :

The students will be able to-

- Apply the knowledge of electrolysis in engineering applications .
- Apply the properties of metals and alloys in engineering fields.
- Apply knowledge of extraction , properties of copper in engineering application.
- Know various dielectric materials used for electronic equipments.
- Use nonmetallic materials in engineering applications.

CONTENT :

A. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	<p>ATOMIC STRUCTURE</p> <p>1.1. Definition of atom Atomic Number, Mass Number, Atomic weight, Isotopes, isobars</p> <p>1.2. Fundamental particles of atom</p> <p>1.3. Bohr’s theory of atom</p> <p>1.4. Hund’s rule of maximum multiplicity</p> <p>1.5. Pauli’s exclusion principle</p> <p>1.6. Aufbau’s principle</p> <p>1.7. Rules of distribution of planetary electrons</p> <p>1.8. Electronic configuration of atoms with atomic number 1-30</p> <p>1.9. Electronic configuration of Inert gases and their characteristics</p> <p>1.10. Lewis and Langmuir’s concept of stable electronic configuration</p> <p>1.11. Electovalency and Co-valency</p> <p>1.12. Formation Of electrovalent compounds- NaCl, MgO</p> <p>1.13. Formation of Covalent compounds-H₂O,CO₂</p>	07	08

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
2	<p>ELECTROCHEMISTRY</p> <p>2.1 Definitions- Conductor, Electrolyte, Electrode</p> <p>2.2 Difference between metallic conduction and electrolytic conduction</p> <p>2.3 Distinguish between Atom & Ion</p> <p>2.4 Arrhenius Theory Of Ionisation</p> <p>2.5 Degree of Ionisation & Factors affecting degree of ionization</p> <p>2.6 Electrolysis of CuSO₄ solution by using Pt –electrodes, Cu-electrodes</p> <p>2.7 Industrial applications of electrolysis</p> <p>2.8 Electroplating</p> <p>2.9 Electro refining of Metals.</p> <p>2.10 Faraday;s Laws of Electrolysis</p> <p>2.11 Numerical problems based on Faraday’s law</p>	07	08
3.	<p>CORROSION AND PROTECTIVE COATING</p> <p>3.1 Definition and Types of corrosion</p> <p>3.2 Dry or Atmospheric corrosion</p> <p>3.2.1 Oxide Film Formation & its types</p> <p>3.2.2 Factors affecting atmospheric corrosion</p> <p>3.3 Wet or electrochemical corrosion</p> <p>3.3.1 Galvanic Corrosion</p> <p>3.3.2 Factors influencing immersed corrosion</p> <p>3.3.3 Nature of the Metal, Nature of Corroding environment and P^H value</p> <p>3.4 Methods of protection of metal from corrosion Hot dipping (Galvanizing & Tinning),Metal spraying, Metal cladding, Cementation or diffusion coating- sherardizing</p>	07	08
4	<p>WATER</p> <p>4.1 Impurities in natural water</p> <p>4.2 Hard water and Soft water</p> <p>4.3 Hardness of water- Temporary & Permanent</p> <p>4.4 Reactions of hard water with soap</p> <p>4.5 Disadvantages of hard water for domestic purpose</p> <p>4.6 Disadvantages of hard water for Industrial purpose in Textile Industry, Sugar Industry, Paper Industry, Dying Industry</p>	11	16

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
	4.7 Scale and Sludge formation 4.8 Causes of scale formation in boilers , it's disadvantages and removal of scale Sterilization of water 4.9 Chlorination –by Cl ₂ , bleaching powder, chloramine with chemical reactions 4.10 Ion Exchange method to remove total hardness of water 4.11 P ^H concept , P ^H scale & Numericals		
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Section II

Sr. No.	Topics / Subtopics	Lectures (Hours)	Theory Evaluation (Marks)
5	CELL AND BATTERIES 5.1 Definition of Electrochemical cell, Battery, Charge, Discharge, Closed Circuit Voltage, Electrochemical couple, Internal resistance, Open Circuit Voltage, Separator, E.M.F. 5.2 Classification of Batteries such as – Primary, Secondary and Reserve Batteries 5.3 Construction, Working and Applications of a Primary Cell such as Dry Cell , Secondary Cell such as Lithium- ion cell 5.4 Charging and Discharging of Lithium- ion cell 5.5 Hydrogen-Oxygen fuel cell, its chemical reactions and advantages 5.6 Introduction of solar cell	08	08
6	METALLIC CONDUCTORS 6.1 Occurrence of metals 6.2 Distinction between mineral and ore 6.3 Definition of flux, Gangue and Slag 6.4 Steps involved in metallurgy-Flow chart	12	14

	<p>6.4.1 Concentration of ores—Physical Methods - Gravity Separation Method Electromagnetic separation ,Froth floatation method</p> <p>6.4.2 Chemical Methods -Calcination and Roasting .</p> <p>6.5 Important ores of copper Metallurgy of copper-Extraction of copper from copper pyrites by concentration , roasting, smelting , Bessemerisation ,Electrorefining</p> <p>6.6 Physical chemical properties (action of air ,water &acids) and uses of copper.</p>		
7	<p>SOLDERS</p> <p>7.1 Definition and classification of alloys</p> <p>7.2 Purposes of making alloy</p> <p>7.3 Composition, properties & applications of Soft solder, Tinmann’s solder, Brazing alloy , Plumber’s solder , Rose metal</p>	03	06
8	<p>SEMICONDUCTORS</p> <p>8.1 Definition of semiconductor</p> <p>8.2 Properties &Applications of Semiconductors such as Silicon ,Germanium,Selenium, Graphite, Silicon carbide ,Cadmium sulphide</p>	02	04

9	<p>CHEMISTRY OF NONMETALLIC ENGINEERING MATERIALS</p> <p>9.1 INSULATORS</p> <p>9.1.1 Definition of insulator, Dielectrics</p> <p>9.1.2 Characteristics of good insulator</p> <p>9.1.3 Classification of insulating materials-solid, liquid, gases</p> <p>9.1.4 Preparation, properties & uses of glass wool, Thermocole</p> <p>9.1.5 Properties & uses of Asbestos ,Ceramics ,glass, mica</p> <p>9.2 POLYMERS</p> <p>9.2.1 Definition of Polymer ,Polymerization , types of polymerisation</p> <p>9.2.2 Preparation ,properties & uses of Teflon & Epoxy resin</p> <p>9.3 ADHESIVES Definition , Characteristics of good Adhesives, Properties and uses of Adhesives.</p> <p>9.4 COMPOSITE MATERIALS Definition, Classification, Properties and Applications</p>	07	08
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination :

Section / Topic no.	Name of topic	Distribution of marks			Total marks
		Knowledge	Comprehension	Application	
I / 1	Atomic structure	06	02	-	08
I / 2	Electrochemistry	02	02	04	08
I / 3	Corrosion & protective coating	04	02	02	08
I / 4	Water	08	04	04	16
II/5	Cell & Batteries	04	02	02	08
II/6	Metallic conductors	08	03	03	14
II/7	Solders	02	02	02	06

II/8	Semiconductors	02	02	-	04
II/9	Chemistry of nonmetallic engg. materials	02	02	04	08
	Total	38	21	21	80

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

B. TERM WORK Term work shall consist of the following :

i) Laboratory experiments and related skills to be developed :

Sr. No.	Title of Experiment	Skills to be developed
1	Industrial Applications of Chemistry	Learning skill and collecting information
2	Introduction to Chemistry laboratory	Handling of, glasswares and instruments
3	Preparation of 1 N, 0.5 N & 0.1 N Solutions of different chemicals like NaOH, HCl, Oxalic acid, FeSO ₄ , etc.	Skill of weighing , measuring and preparation of solutions
4	Titration of strong acid and strong bases (HCl X NaOH)	Skills of determining accurate end point of titration & development of measurement skills.
5	Titration of strong acid, strong base & weak acid (HCl X NaOH X H ₂ C ₂ O ₄ .H ₂ O)	Skills of determining accurate end point of titration & development of measurement skills.
6	Estimation of chloride content in water by Mohr' s method	Measurement skill utilization of practical data for testing & estimation
7	Determination of amount of Ca and Mg ions present in given sample of water by E.D.T.A method	Measurement skill utilization of practical data for testing & estimation
8	Estimation of viscosity of oils by Ostwald's method	Measurement skill utilization of practical data for testing & estimation

9	Determination of pH of solution by Lovibond comparator & pH meter	Utilization of practical data for testing & estimation
10	Estimation of Ca in limestone.	Measurement skill utilization of practical data for testing & estimation
11	Estimation of % of Fe in given sample of steel	Measurement skill utilization of practical data for testing & estimation

ii) Progressive Skills Test :
Criteria for Continuous Assessment of Practical work and Progressive skill Test :

Sr. No.	Criteria	Marks allotted
1	Observation Table & Chemical Reactions	05
2	Correct Observations	10
3	Calculations & Result	05
4	Attendance / Workmanship /Procedure / Safety measures	05
	Total	25

Assessment at semester end practical exam as per Pro-forma II.

iii) Industrial Exposure :

Sr. No.	Mode of Exposure (Visit/Exp.Lect/Ind.Survey/...)	Topic
1.	Industrial applications in engineering chemistry	
2.	Industrial survey	

Report of each Industrial Exposure Activity shall be submitted by student as a part of term work for evaluation.

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Observation Table & Chemical Reactions	10
2	Correct Observations	20
3	Calculations & Result	10
4	Attendance / Workmanship /Procedure / Safety measures	10
5	Total	50

INSTRUCTIONAL STRATEGIES :

Instructional Methods :

1. Lectures cum Discussions 2. Regular Home Assignments.

Teaching and Learning resources:

1. Chalk board 2. O.H.P. 3. Slides 4. Item Bank

REFERENCE MATERIAL :a) Books / Codes <at least 5>

Sr. No.	Author	Title	Publisher
1.	Jain & Jain	Engineering chemistry	Dhanpatrai publishing co.
2.	S. C. Rangawala	Engineering materials	Engineering publication
3.	Jain & Agarwal	Metallurgical Analysis	Agarwal publications
4.	O. P. Khanna	Material science & technology	Khanna publication on 2006
5.	Rollason	Metallurgy for Engineers	ASM publication
6.	J. C. Kuriacose	Chemistry in Engineering & Vol. 1 & 11	
7.	P. C. Jain	Chemistry of Engineering Materials	
8	S. S. Dara	A text of Engineering Chemistry	

b) Websites

- ✓ www.substech.com
- ✓ www.kentchemistry.com
- ✓ www.ustudy.in/node/1383

COURSE ID: 03

Course Name : BASIC MATHEMATICS
Course Code : CCE105
Course Abbreviation : EBMT

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : < nil >

Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	03	04
Practical	01	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical /Oral Examination	
Details of Evaluation	Average of two tests of 20 marks each	i.25 marks for each practical ii.One PST of 25 marks	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

Mathematics is an important prerequisite for the development and understanding of engineering and technological concepts. For an engineer and technologist, knowledge of mathematics is an effective tool to pursue and master the applications in the engineering and technological fields. Algebra provides the language and abstract symbols of mathematics. The topics Matrices and Determinants are helpful for finding optimum solution of system of simultaneous equations which are formed in the various branches of engineering using different parameters .Trigonometry is the study of triangles and angles. Contents of this subject will form foundation for further study in mathematics.

OBJECTIVES:

The student will be able to

1. Apply Cramer’s rule and matrix method to solve simultaneous equations in three variables
2. Apply rules to solve different cases of partial fractions.
3. Apply concept of allied angle, compound angle, multiple and sub-multiple angles to solve engineering problems.
4. Apply factorization and de-factorization formulae to solve examples.
5. Apply factorization and de-factorization formulae to solve examples.

6. Apply properties and solution of triangle to solve engineering examples.

CONTENT :

A) THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	Determinants 1.1 Definition, Expansion of second and third order determinants 1.2 Properties of determinants (without proof), 1.3 Examples on properties 1.4 Cramer's Rule	04	08
2	Partial Fractions 2.1 Definition of rational, proper and improper fractions 2.2 various cases of partial fractions and Examples	06	10
3	Matrices 3.1 Definition of a matrix, Types of matrices 3.2 Algebra of matrices 3.3 Equality of two matrices, Transpose of a matrix 3.4 Minor and Co-factor of an element of a matrix 3.5 Adjoint of a matrix 3.6 Inverse of a matrix 3.7 Solution of simultaneous equations by matrix method	10	16
4	Binomial Theorem 4.1 Statement, factorial notation. Expansion 4.2 General term 4.3 To find middle term or any term or coefficient of given expansion	04	06
	Total	24	40
<p>1.Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.</p> <p>2.In each topic, corresponding applications will be explained</p>			

Section II

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
5	Trigonometric Ratios and Identities 5.1 System of measurement of angles 5.2 Trigonometric ratios of any angle, Fundamental Identities 5.3 Examples on Identities	04	08
6	Allied, Compound and Multiple Angles 6.1 Trigonometric ratios of Allied angles, Compound angles Multiple angles (2A,3A) ,Sub-multiple angles 6.2 Sum and Product formulae	08	14
7	Inverse Circular functions 7.1 Inverse Circular functions, Examples	04	06
8	Properties and solution of any triangle 8.1 Properties of triangle (sine, cosine, tangent rule) 8.2 Half angle formulae (without proof) 8.3 Solution of any triangle	08	12
	Total	24	40
<p>1.Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.</p> <p>2.In each topic corresponding applications will be explained</p>			

Specification table for setting question paper for semester end theory examination :

Topic No.	Name of topic	Distribution of marks (level wise)			Total Marks
		Knowledge	Comprehension	Application	
1	Determinants	2	2	4	8
2	Partial Fractions	2	2	6	10
3	Matrices	2	2	12	16
4	Binomial Theorem	2	-	4	06
5	Trigonometric Ratios and Identities	2	2	4	08
6	Allied, Compound	2	-	12	14

	and Multiple Angles				
7	Inverse Circular functions	2	-	4	06
8	Properties and solution of any triangle	2	2	8	12
TOTAL		16	10	54	80

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

B) TUTORIALS

Sr.No	Topics	Tutorial Content (10 problems in each tutorial)
1	Determinants	Examples on properties of determinants & Cramer's Rule
2	Partial Fractions	To resolve given function into partial fractions-Different cases
3	Matrices	Examples on addition ,Subtraction and Multiplication of Matrix
4	Matrices	To find adjoint ,Inverse of a given matrix,To solve simultaneous equation by Matrix method
5	Binomial Theorem	To expand $(x+y)^n$ by Binomial theorem, To find middle term,any term, coefficient of given expansion
6	Trigonometric Ratios and Identities	Examples on fundamental Identities of Trigonometry
7	Allied, Compound and Multiple	Examples on Allied Compound, Multiple & submultiple angles
8	Allied, Compound and Multiple Angles	
9	Inverse Circular functions	Inverse circular function
10	Properties and solution of any triangle	Properties of triangle, Solution of Triangle.

INSTRUCTIONAL STRATEGIES:

Instructional Methods:

1. Lectures cum Demonstrations
2. Tutorials

Teaching and Learning resources:

1. Chalk board
2. Item Bank

REFERENCE MATERIAL:

a) Books:

Sr. No.	Author	Title	Publisher
1.	G.V. Kumbhojkar	A Text Book on Engineering Mathematics (First Year Diploma)	Phadake Prakashan, Kolhapur
2.	Patel,Rawal and others	Basic Mathematics	Nirali Prakashan,Pune
3.	P.M.Patil and Others	Basic Mathematics	Vision Prakashan, Pune
4.	Samer Shah	Basic Mathematics	Tech-max Publication,Pune
5.	S.P.Deshpande	Mathematics for polytechnic	Pune Vidyarthi Griha,Pune

b) Website

- i) www.khanacademy.org
- ii) www.easycalculation.com
- iii) www.math-magic.com

COURSE ID : 04

Course Name : ENGINEERING MATHEMATICS
Course Code : CCE106
Course Abbreviation : EEMT

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : CCE105 Basic Mathematics

Teaching Scheme :

Scheme component	Hours / week	Credits
Theory	03	04
Practical	01	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Oral Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i. 25 marks for each practical ii. One PST of 25 marks	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

This subject is an extension of Basic mathematics of first semester and a bridge to further study of applied mathematics. The knowledge of mathematics is useful in other technical areas. Differential calculus has applications in different engineering branches. For example concepts such as bending moment, curvature, maxima and minima. Numerical methods are used in programming as an essential part of computer engineering. In Metrology and quality control statistical methods are used to determine the quality and suitability of components. For solution of problems in electrical circuits and machine performances complex number is used. Engineering mathematics lays the foundation to understand technical principles in various fields.

OBJECTIVES:

The student will be able:

1. Apply rules and methods of Co-ordinate geometry in Animation , Autocad, Computer graphics etc.
2. Apply rules and methods of differential calculus to solve problems.
3. Apply various numerical methods to solve algebraic and simultaneous equations

CONTENT:

C. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	Point and Distances 1.1 Point & Distance formula (No Examples & without Proof) 1.2 Section formulae (No Examples & without proof) 1.3 Centroid of a triangle & Area of Triangle	02	04
2	Straight line 2.1 Various forms of equations of straight line 2.2 Perpendicular distance of a point from a line 2.3 Angle between two straight lines 2.4 Conditions for two straight lines to be parallel and Perpendicular to each others 2.5 Intersection of two straight lines	06	08
3	Circle 3.1 Equations of Circle (various forms) 3.2 Equations of tangent and normal to any circle	04	08
4	Numerical solution of Algebraic Equations and simultaneous Equations 4.1 Bisection Method 4.2 Regula- Falsi Method 4.3 Newton –Raphson Method 4.4 Gauss elimination Method 4.5 Jacobi’s Method 4.6 Gauss-Seidal Method.	12	20
	Total	24	40
<p>1.Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.</p> <p>2.In each topic corresponding applications will be explained</p>			

Section II

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
5	Functions And Limits 5.1 Concept of function, Types of functions and value of a function 5.2 Meaning of $x \rightarrow 0$, $x \rightarrow a$, $x \rightarrow \infty$, 5.3 Idea of limit of a function, Various theorems (Without Proof) 5.4 Evaluation of limits, Factorization, Rationalization, Simplification ,Infinity Method, Trigonometric Limits, Exponential Limits, Logarithmic Limits	10	14
6	Differentiation 6.1 Definition, Derivative of standard functions (without poof), 6.2 Derivative of sum, difference, product and quotient of two or more functions 6.3 Derivative of composite functions 6.4 Derivative of Inverse functions 6.5 Derivative of Implicit functions 6.6 Derivative of Parametric functions 6.6 Derivative of exponential and logarithmic functions 6.7 Logarithmic differentiation 6.7 Differentiation of second order	12	20
7	Applications Of Derivatives 7.1 Geometrical meaning of derivative (To find equation of Tangent and normal) 7.2 Maxima and minima of functions 7.3 Displacement, velocity and Acceleration of a particle.	02	06
	Total	24	40
<p>1.Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.</p> <p>2. In each topic corresponding applications will be explained</p>			

Specification table for setting question paper for semester end theory examination:

Topic No.	Name of topic	Distribution of marks (level wise)			Total Marks
		Knowledge	Comprehension	Application	
1	Point and Distances	2	--	2	4
2	Straight line	2	2	4	8
3	Circle	2	2	4	8
4	Numerical solution of Algebraic Equations and simultaneous Equations	2	2	16	20
5	Functions And Limits	2	2	10	14
6	Differentiation	4	4	12	20
7	Applications Of Derivatives	--	--	6	6
Total		14	12	54	80

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

D. TUTORIALS

Note:Tutorials are to be used to get enough practice

Sr No.	Topic	Tutorial Content (10 problems in each tutorial)
1	Straight line	To find equation of straight line- Different forms.
2	Straight line	To find perpendicular distance of a point from a line, angle between two lines, intersection of lines.
3	Circle	To find equation of Circle- Different forms
4	Num.solution of Algebraic & simultaneous Eq	Numerical solution of algebraic equations.
5		Numerical solution of simultaneous equations
6	Functions And Limits	Evaluation of limits by Factorisation,Rationalization,Simplification,Infinity method
7		Evaluation of limits of Trigonometric functions, Exponential functions,

		Logarithmic functions.
8	Differentiation	To find derivatives by product rule, quotient rule, Chain rule, Inverse function, Implicit function
9	Differentiation	To find derivatives of Parametric function, Logarithmic function, Derivatives of second order
10	Applications of Derivatives.	To find equation of Tangent, Normal & To find Maxima and Minima of a function.

INSTRUCTIONAL STRATEGIES:

Instructional Methods:

1. Lectures cum Demonstrations
2. Tutorials

Teaching and Learning resources:

1. Chalk board
2. Item Bank

REFERENCE MATERIAL:

a) Books:

Sr. No.	Author	Title	Publisher
1.	G.V. Kumbhojkar	Engineering Mathematics III	Phadake Prakashan, Kolhapur
2.	Patel, Rawal,	Engineering Mathematics	Nirali Prakashan, Pune
3.	P.M. Patil and others	Engineering Mathematics	Vision Publication, Pune
4.	Sameer Shah	Engineering Mathematics	Tech-Max Publication, Pune
5.	A.M. Vaidya	Applied Mathematics	Central Techno

b) Websites

- i) www.khanacademy.org
- ii) www.easycalculation.com
- iii) www.math-magic.com

COURSE ID: 05

Course Name : ENGINEERING GRAPHICS
Course Code : CCE109
Course Abbreviation : EEGR

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : < nil >

Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	02	06
Practical	04	

Evaluation Scheme :

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (External)	
Details of Evaluation	--	25 marks for each practical One PST of 25 marks	--	As per Proforma-VI	As per Proforma-V	
Marks	--	--	--	25	50	75

RATIONALE :

Engineering Graphics is one of the ways of communication among engineering professionals. It describes scientific facts, concepts, principles and techniques of drawing in any engineering fields to express the ideas and conveying the instructions which are use for carrying out tasks at work place. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects. This subject is useful in developing, drafting and sketching skills of students. So it is necessary to all programmes.

OBJECTIVES :

The student after studying this subject will be able to:-

1. Solve problems on geometrical constructions.
2. Draw orthographic projections of different objects.
3. Visualize three dimensional objects and draw Isometric Projections.
4. Draw simple geometrical figures using CAD software package.
5. Solve problems on Projection of lines and planes.

CONTENT:

E. THEORY :

SECTION -I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Practical Evaluation (Marks)
1	Introduction To Engineering Drawing 1.1 Drawing Instruments and their uses 1.2 Standard sizes of drawing sheets 1.3 Letters and numbers (single stroke vertical) 1.4 Convention of lines and their applications 1.5 Scale (reduced, enlarged & full size) Plain scale and Diagonal scale. 1.6 Dimensioning technique as per SP-46 (Latest Edition) Types and applications of chain, parallel and Co-ordinate dimensioning 1.7 Introduction to CAD software (Basic commands like Draw, modify). 1.8 Advantages of CAD, 1.9. Geometrical constructions	06	10
2	Projection Of Point And Lines 2.1 Projection of points when point is in first quadrant Only 2.2 Projection of Line inclined to one Reference plane and Parallel to other Reference Plane (Both ends of line should be in first quadrant)	04	06
3	Projection Of Planes 3.1 Projection of Planes of Circular , Square, Triangular, Rectangular , Pentagonal , Hexagonal Shapes Inclined To One Reference Plane And perpendicular to other Reference Plane. (Planes in First Quadrant Only)	06	06

SECTION –II

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Practical Evaluation (Marks)
4	Orthographic Projection 4.1 Introduction of Orthographic Projection-First and Third angle Projection Method 4.2 Conversion of Pictorial view into Orthographic Views. (First angle Projection Method Only) 4.3 Dimensioning Technique as per SP-46	06	16
5	Sectional Views. 5.1 Types of sections 5.2 Conversion of pictorial view into sectional Orthographic views. (First Angle Projection Method only)	04	
6	Isometric Projection 6.1 Introduction 6.2 Isometric Axis 6.3 Isometric scale 6.4 Drawing of Isometric view and Projection. 6.5 Conversion of Orthographic Views into Isometric view/projection(Including rectangular, cylindrical objects, representation of slots on sloping as well as plane surfaces)	06	12
	Total	32	50
Semester end Practical exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end Practical examination :

Topic No.	Name of topic	Distribution of marks			Total marks
		Knowledge	Comprehension	Application	
1	Introduction To Engineering Drawing	04	02	04	10
2	Projection of Point And Lines	02	02	02	06
3	Projection of Planes	02	02	02	06
4	Orthographic projection	04	04	08	16
5	Sectional Views.				
6	Isometric Projection	04	02	06	12
	TOTAL	16	12	22	50

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

Practical:

Sr No.	Title of Practical Exercise	Skills / Competencies to be developed
1	Geometrical Constructions Using CAD (1 Sheet)	To develop drawing skill
2	Projections of line (1 Sheet)	To develop drawing ability in Projections of line
3	Projections of Planes (1 Sheet)	To develop drawing ability in Projections of Planes
4	Orthographic projection (1 Sheet)	To develop drawing ability to draw Orthographic projection
5	Sectional Views. (1 Sheet)	To develop drawing ability in sectional views
6	Isometric Projection (2 Sheet) Isometric views of two objects – 1 sheet Isometric Projections of two objects – 1 sheet	To develop ability to draw Isometric projection

ASSESSMENT CRITERIA FOR TERM WORK

c) Continuous Assessment of Drawing Practical

d) Continuous Assessment of Drawing Practical

Every practical Sheet shall be assessed for **25** marks as per criteria given below:

Sr No.	Criteria	Marks allotted
1	Attendance	05
2	Preparedness	05
3	Correctness and understanding	10
4	Line work and neatness	05
	Total	25

One mid-term *Progressive Skill Test* of **50** marks shall be conducted as per criteria given below:

Sr No.	Criteria	Marks allotted
1	Correctness and understanding	20
2	Line work and neatness	10
3	Dimensioning and judgment without measurement	10
4	Proper use of instrument	10
	Total	50

INSTRUCTIONAL STRATEGIES :

Instructional Methods :

1. Lectures cum Demonstrations
2. Classroom practices

Teaching and Learning resources :

1. Chalk board
2. LCD presentations
3. Audio presentations
4. Computer, printer etc.
5. Question Bank

a) Reference Books

Sr. No.	Author	Title	Publisher
1.	N. D. Bhatt	Engineering Drawing	Charotar Publishing House 2010
2.	Amar Pathak	Engineering Drawing	Dreamtech Press, 2010
3.	D.Jolhe	Engineering Drawing	Tata McGraw Hill Edu., 2010
4.	M.B.Shah, B.C.Rana	Engineering Drawing	Pearson, 2010
5.	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age Publication, Reprint 2006
6.	IS Code, SP – 46	Engineering Drawing Practice	--

b) Web References :

- 1) <http://www.design-technology.info/IndProd/drawings/>
- 2) <http://graphicalcommunication.skola.edu.mt/syllabus/engineering-drawing/>
- 3) http://en.wikipedia.org/wiki/Engineering_drawing
- 4) <http://www.engineeringdrawing.org/>
- 5) http://www.teachengineering.org/view_activity
- 6) www.howtoread.co.in/2013/06/how-to-read-ed.html
- 7) <http://www.slideshare.net/akhilrocker143/edp>
- 8) <http://www.24framesdigital.com/pstulpule>

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COURSE ID: 06

Course Name : COMPUTER FUNDAMENTALS
Course Code : ITE103
Course Abbreviation : ECFA

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	1	3
Practical	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	--	i. 25 marks for each practical ii. One PST of 25 marks	--	As per Proforma-VI	As per Proforma-V	
Marks	--	--	--	25	50	75

RATIONALE:

Computers play a vital role in various fields like business, academics, defense, budget research, engineering, medicine. In the present Industrial & commercial environment, the technician is expected to use computers skillfully.

The primary purpose of this course is to give an elementary but sound fundamental understanding of how computers work, its basic hardware software components, what basic applications of computer technology currently exist, how they work and basic knowledge and applications of Internet.

OBJECTIVES:

The student should be able to

1. Understand functions of hardware & software components of a computer system.
2. Understand the operating system as the interface to the computer system.
3. Use word processors, spreadsheets, presentation software, database application.
4. Understand and use various applications of the Internet.

CONTENT:

Sr. No.	Topics / Sub-topics	Lectures (Hours)
1	INTRODUCTION 1.1 History of computers 1.2 Types of computers 1.3 Applications of computers –Education, Business, Medical, Engineering etc.	1
2	SYSTEM UNIT 2.1 System Board 2.2 Microprocessor 2.3 Memory and its types 2.4 Expansion cards	1
3	HARDWARE COMPONENTS 3.1 Input devices and its connections: Keyboard, Mouse, Scanner, Microphone 3.2 Output devices and its connections: Monitors, Printers, Projectors, Speakers 3.3 Storage devices: Hard disks, Magnetic Tapes, Optical Discs, Pen drive 3.4 Tips on “How to buy a computer?”.	2
4	INTRODUCTION TO SOFTWARE 4.1 Types of software 4.1.1 System software	2

Sr. No.	Topics / Sub-topics	Lectures (Hours)
	4.1.2 Application Software 4.2 Introduction to Operating System 4.2.1 Definition: Operating System 4.2.2 Role of Operating System 4.2.3 Various Examples of Operating Systems	
5	WORD PROCESSING 5.1 Opening a document 5.2 Edit menu 5.3 Format Menu – Font, Paragraph, Bullets, Borders 5.4 Table formatting 5.5 Spell-check, mail-merge 5.6 Inserting picture, word art, header footer 5.7 Printing document 5.8 Equation editor 5.9 Examples of Editors-Edit Plus. Turbo C editor	2
6	SPREAD SHEET SOFTWARE 6.1 Basic worksheet skill. 6.2 Entering worksheet data. 6.3 Speed data entry. 6.4 Worksheet editing. 6.5 Auto correct worksheet 6.6 Cell editing. 6.7 Finding & replacing. 6.8 Inserting & Deleting cells, Rows & columns 6.9 Formulae. 6.10 Worksheet formatting. 6.11 Auto formatting worksheets. 6.12 Chart wizard 6.13 Conditional formatting	2
7	PRESENTATION SOFTWARE 7.1 Creating new presentation 7.2 Slide, Slide sorter, Notes page views 7.3 Saving & printing the work 7.4 Using various slide Designs for single and multiple slides 7.5 Adding art.	2

Sr. No.	Topics / Sub-topics	Lectures (Hours)
	7.6 Adding Custom animation & Slide Transition 7.7 Editing individual slide 7.8 Updating text & text boxes 7.9 Action Buttons	
8	DATABASE 8.1 Introduction to database 8.2 Database Terminologies- Database, Table, Attributes(column), Tuples(rows), data types 8.3 Creating database in Access 8.4 Creating tables 8.5 Inserting records 8.6 Creating forms 8.7 Creating reports	1
9	INTERNET 9.1 Concept: Network 9.2 Types of Networks-LAN, WAN, MAN 9.3 Internet basic terminology 9.4 Client, server concepts 9.5 Applications of Internet 9.6 Hardware & software requirements for internet connection 9.7 Various examples of Browsers 9.8 Browsing 9.9 Search Engines 9.10 Chatting 9.11 E-commerce 9.12 Virus, Types of Viruses, Virus Protection	1
10	CYBER LAWS AND ETHICS 10.1 Introduction 10.2 Moral, Ethics and Law 10.3 Need for Ethics culture 10.4 Introduction to Cyber Law 10.5 Information Technology Act of India 2000 10.6 The Ten commandments of computing 10.7 Security, Privacy and Control 10.8 Intellectual property rights	2

Laboratory experiments and related skills to be developed :

Sr. No.	Title of Experiment	Skills to be developed
1.	Understanding PC(system unit and connections of internal components)	<ol style="list-style-type: none"> 1. Identify the front and rear panel components of CPU 2. Identify different components inside the CPU cabinet <ol style="list-style-type: none"> 2.1 Identify different components on motherboard. 2.2 Motherboard connection. 2.3 Graphics card connection. 2.4 Network interface card connection.
2.	Understanding the storage devices	<ol style="list-style-type: none"> 1. Study various secondary storage devices along with their capacities. 2. Connecting HDD, and CD, DVD drives. 3. Attaching USB devices. Care of the above devices.
3.	Understanding the input/output devices and their connections	<ol style="list-style-type: none"> 1. Study of connections of mouse, keyboard, monitor, printer. 2. Install driver software for a printer, Scanner 3. Set up a printer & scanner Scan a page, print a test page
4.	Study of system software with basics of OS	<ol style="list-style-type: none"> 1. Understanding the concept of system and application software. 2. Examples of system software. 3. Study of application software. 4. Understand the concept & functions of Operating system, Examples of Operating system Overview of Windows OS
5.	Creating and Editing a word document	<ol style="list-style-type: none"> 1. Use of menus and submenus. 2. Type and format the text matter in paragraphs. 3. Set up page size, margins 4. Insert headers and footers, bullets. 5. Use of borders and shading 6. Format picture, word-art, text box etc. 7. Typing text in multi-columns Use of equation editor

6.	Inserting table and Mail-Merge	<p>Table:</p> <ol style="list-style-type: none"> 1. Insert,format Table. 2. Sort data in table <p>Mail-Merge:</p> <ol style="list-style-type: none"> 1. Understand the mail-mergeFacility. 2. Create main document and edit it 3. Create & edit data source 4. Merge the main document anddata source. 5. Merge to file and merge to print.
7.	Creating and Editing a work-book	<ol style="list-style-type: none"> 1. Use of menus and submenus. 2. Enter the data in worksheet. 3. Creating a table in worksheet. 4. Use of editing commands. 5. Fill series by auto-fill handle, Insert / delete rows, columns and worksheet. <p>Set up page size, margins.& set the print area.</p>
8	Use of formulae / Equations / conditions	<ol style="list-style-type: none"> 1. Format & align data in a cell. 2. Insert & format picture and organizational chart. 3. Use of conditional formatting 4. Protect the workbook. 5. Inserting functions in a worksheet. <p>Type equations / formulae</p>
9	Understanding the basics of presentation software & Creating a new presentation	<ol style="list-style-type: none"> 1. Insert new / duplicate slides 2. Create objects on a slide and use general editing operations. 3. Use of different views in presentation 4. Use standard templates for slides. <p>Use preset animation, slide transition and Prepare speaker notes.</p>
10	Using advanced features of slide-show	<ol style="list-style-type: none"> 1. Use of custom animation effect 2. Use of action buttons on slides 3. Rehearse time-setting of slide show
11	Understanding	<ol style="list-style-type: none"> 1. Understanding terminologies of Database

	Database and creating tables	<ol style="list-style-type: none"> 2. Creating a database using access 3. Creating table <p style="text-align: center;">Inserting records</p>
12	Creating forms and reports	<ol style="list-style-type: none"> 1. Creating forms by design view 2. Creating reports by design view
13	Making use of Internet (Email, Chat, virus protection.)	<ol style="list-style-type: none"> 1. Study of different types of networks. 2. Visit the website. 3. Using search engines. 4. Register online for e-mail ID. 5. Communicate with others using e-mail 6. Chatting 7. Installation, use and update of Anti-virus software <p style="text-align: center;">Removing detected viruses</p>
14	Mini Project	Mini Project based on Microsoft office suite which incorporates presentation, database & spreadsheet handling, word processing skills.

iv) Progressive Skills Test :

Criteria for Continuous Assessment of Practical work and Progressive skill Test:

Sr. no	Criteria	Marks allotted
1	Attendance at regular practical	10
2	Preparedness for practical	05
3	Neat & complete Diagram.	05
4	Observations & computer handling skill	05
5	Use of toolbar, menu bar and short cut keys.	05
6	Logical thinking and approach	10
7	Oral Based on Lab work and completion of task	10
TOTAL		50

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1.	Technical ability	20
2.	Communication skill	10
3.	Logical approach	20
	TOTAL.	50

INSTRUCTIONAL STRATEGIES:

Instructional Methods:

1. Lectures cum Discussions
2. Regular Home Assignments.
3. Laboratory experiences and laboratory interactive sessions

Teaching and Learning resources:

1. Chalk board 2. O.H.P. 3. Slides 4. Self-learning Tutors

REFERENCE MATERIAL:

a) Books / Codes

Sr. No.	Author	Title	Publisher
1.	Sanjay Saxena	A first course in Computers 2003 edition	Vikas Publishing House Pvt Limited
2.	Anita Goel	Computer Fundamentals	Pearson Education India
3.	Sudipto Das	A Complete Guide to Computer Fundamentals	Laxmi Publications
4.	P.K.Sinha	Computer Fundamentals	BPB Publication

b) Websites

- ✓ <http://my.safaribooksonline.com>
- ✓ <http://www.edulearn.com>
- ✓ <http://kvsecontents.in/computer-fundamentals>

COURSE ID : 07

Course Name : C Programming
Course Code : ITE104
Course Abbreviation : ECPR

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme :

Scheme component	Hours / week	Credits
Theory	3	7
Practical	4	

Evaluation Scheme :

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i. 25 marks for each practical ii. One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma-II	
Marks	20	--	80	--	50	150

RATIONALE :

This course is designed to develop programming attitude and attract the interest of the students in the C Language .Now a day's almost every set up in software Engineering domain chooses C as a basic tool to develop software, so it is useful to study structured and dynamic language like C.

OBJECTIVES :

The students will be able to:

1. Write short and simple C programs.
2. Implement data types and structures related to problems.
3. Solve the problems / tasks in a structured way.

CONTENT :

F. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	C FUNDAMENTALS 1.1 History of c 1.2 C character set 1.3 Identifiers & Keywords, 1.4 Data types 1.5 Variables 1.6 Declarations 1.7 Constants 1.8 Expressions 1.9 C Instructions 1.10 The first C program 1.11 Compilation & Execution	04	06
2	OPERATORS& DATA INPUT AND OUTPUT FUNCTIONS 2.1 Operators 2.1.1 Arithmetic Operators 2.1.2 Assignment Operator 2.1.2 Unary operators 2.1.3 Relational & Logical Operators, 2.1.4 Conditional & Comma Operator 2.2 Simple Statement 2.3 Input and Output Library Functions 2.3.1 printf() 2.3.2 scanf() 2.3.3 getchar() 2.3.4 putchar() 2.3.5 gets() 2.3.6 puts()	06	10

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
3	CONTROL STATEMENTS 3.1 Decision making and branching 3.1.1 if Statement(if, if-else, if-else ladder, nested if-else) 3.1.2 Switch, break, continue, goto statement 3.2 Decision making and looping 3.2.1 While, do – while, for Statements 3.2.2 Nested loops	06	12
4	FUNCTIONS 4.1 Defining a Function, Accessing a function, 4.2 Passing arguments to a Function(call by value), Specifying argument data types 4.3 Scope and lifetime of variables 4.4 Function prototypes 4.5 Category of function(No argument no return value, argument with no return value, No argument with return value, argument with return value) 4.6 Recursion	08	12
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Section II

Sr. No.	Topics / Subtopics	Lectures (Hours)	Theory Evaluation (Marks)
5.	ARRAYS 5.1 Defining an array, 5.2 One dimensional array ,Declaration and Initialization of Arrays, 5.3 Two Dimensional Arrays Declaration and Initialization of Arrays, 5.4 Passing arrays to a function	06	14
6	CHARACTERS & STRINGS 6.1 The char data type, using character variables, using string 6.2 Declaring and initializing string variables, 6.3 Reading strings from terminal 6.4 Writing Strings to screen, putting strings together. 6.5 Comparison of two strings 6.6 String- handling Functions	08	12
7	Structures and Pointers 7.1 Simple structures (Defining & declaring structures, accessing structure members) 7.2 Complex structures (structures that contain arrays) 7.3 Arrays of structure, Initializing structure, 7.4 Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable	10	14
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination:

Section / Topic no.	Name of topic	Distribution of marks			Total marks
		Knowledge	Comprehension	Application	
I / 1	C Fundamentals	6	0	0	06
I / 2	Operators & Data Input and Output Functions	5	3	2	10
I / 3	Control Statements	4	4	4	12
I / 4	Functions	6	4	2	12
II / 5	Arrays	6	4	4	14
II/6	Characters & Strings	4	4	4	12
II/7	Structures, Unions and Pointers	6	4	4	14

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

G. TERM WORK

Term work shall consist of the following:

v) Laboratory experiments and related skills to be developed :

Sr. No.	Title of Experiment	Skills to be developed
01	Study of Flowcharts and Algorithm	1.1 Understanding an Algorithm 1.2 Understanding the Flowchart 1.3 Study of various Flowchart Symbols 1.4 To draw Flowchart on any Practical routine
02	Character set and operators	2.1 Detail study of character set of C language 2.2 Understanding Operator 2.3 Various types of operator and their use
03	Valid and invalid identifiers, variables and constants	3.1 Understanding an identifier, variables, constant, Keyword 3.2 Difference between identifier and Keyword. 3.3 Rules for valid variables, identifiers , constants. 3.4 Identify valid and invalid variables, keywords, identifiers, constants
04	Study of .C.	4.1 Understanding expression

	expressions	4.2 Conversion of mathematical Expression to Expression in .C. 4.3 Identify valid and invalid C expressions. 4.4 Correct invalid Expressions
05	Input and output Functions	5.1 Standard Input function- scanf() 5.2 Standard Output function-printf() 5.3 Standard Header file 5.4 Syntax and use of scanf() and printf() function with example
06	Simple programming using Input and Output Functions.	6.1 Study of simple programming structure 6.2 Use of arithmetic expression. 6.3 Use of library functions
07	Study of Control statements	7.1 conditional and unconditional branching 7.2 syntax and use of go to statement 7.3 use of forward and backward jumping 7.4 Program based on goto statement
08	Study of control structure	8.1 necessity of control structure 8.2 types of control structure <ul style="list-style-type: none"> • Decision making statements • If statement • If-else statement 8.3 syntax and flowchart of if statement 8.4 Program based on if statement
09	Study of control structure: switch statement	9.1 use of switch statement 9.2 Syntax and flowchart of switch statement. 9.3 significance of break statement in switch case 9.4 use of default statement in switch case 9.5 Program using switch statement
10	Study of for statement	10.1 definition of loop 10.2 syntax and flowchart of for loop 10.3 execution of for loop

		10.4 nested for loop ,syntax ,flowchart 10.5 Program based on for loop
11	Study of while loop	11.1 Exit control and Entry control loop 11.2 syntax and flowchart of while loop 11.3 execution of while loop 11.4 program based on while loop
12	Study of do while loop	12.1 Exit control and Entry control loop 12.2 syntax and flowchart of do_ while loop 12.3 execution of do_while loop 12.4 nested do while loop, syntax, flowchart 12.5 program based on do_while loop
13	Study of function	13.1 Understanding function 13.2 function declaration or prototype 13.3 syntax to declare a function 13.4 function call 13.5 Program using functions
14	Study of function Category	14.1 function declaration or prototype 14.2 syntax to declare a function 14.3 function call 14.4 function parameters 14.5 function return value 14.6 Program using functions
15	Study of Recursive function	15.1 definition of recursion 15.2 use of recursion 15.3 program using recursion function
16	Study of an array	16.1 Understanding and use of an array 16.2 size of an array 16.3 syntax to declare an array 16.4 read and print the elements of an array 16.5 access a particular element of an array 16.6 Any Two programs based on arrays
17	Study of two	17.1 Understanding and use of twodimensional array

	dimensional array	17.2 size of 2-D array 17.3 Syntax to declare 2-D array 17.4 read and print the elements of 2-D array 17.5 access a particular element of 2-D array 17.6 use of two dimensional arrays 17.7 Program based on above 2-D array
18	Study of strings using arrays	18.1 Understanding string 18.2 declaration of string array 18.3 reading and printing a string from and to terminal.
19	Study of standard string function	19.1 syntax and use of : strcat(),strlen(),strcmp(),strcpy() 19.2 Program based on string functions
20	Study of Simple Structure	20.1 Understanding and syntax of structure 20.2 size of structure 20.3 declaration and use of variables of structure 20.4 declaring and defining a structure 20.5 accessing members of structure
21	Study of Complex Structure(Structure that contain arrays)	21.1 declaration and use of arrays in structure 21.2 size of structure 21.3 accessing members of array of structure 21.4 Program based on arrays in structure
22	Study of Arrays of Structure	22.1 Understanding and syntax of arrays of structure 22.2 size of structure 22.3 declaration and use of arrays of structure 22.4 accessing members of structure 22.5 Program based on structure array
23	Study of Pointer	23.1 Understanding pointer 23.2 basic difference between variable and pointer 23.3 Declaration of pointer 23.4 Initializing pointer variable 23.5 program to access address of variable

vi) **Progressive Skills Test :**

Criteria for Continuous Assessment of Practical work and Progressive skill Test :

Sr. No.	Criteria	Marks allotted
1	Attendance	5
2	Preparedness for practical	4
3	Algorithm	4
4	Flow chart	4
5	C program	4
6	Logical Approach	4
	Total	25

Assessment at semester end practical exam as per Pro-forma II.

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Technical Ability	10
2	Logical Approach	10
3	Presentation	05
	Total	25

INSTRUCTIONAL STRATEGIES:

Instructional Methods :

- 1) Lectures and discussions.
- 2) Laboratory experiences and laboratory interactive sessions.
- 3) Time bound assignments.

Teaching and Learning resources:

1. Books
2. Transparencies
3. Power Point Presentation
4. Self-learning

REFERENCE MATERIAL:

a) Books / Codes

Sr. No.	Author	Title
1.	E.Balgurusamy	Programming in ANSI C
2.	YashwantKanetkar	Let us C
3	Gottfried	Programming with C .
4	kerningham& Ritchie	The .C. Programming language
5		Teach yourself C in 21 days.

b) Websites

- ✓ <http://cplus.about.com/od/beginnerctutoriali/a/blctut.htm>
- ✓ <http://computer.howstuffworks.com/c.htm>
- ✓ <http://www.indiastudycenter.com/studyguides/sc/objtest/default.asp>

COURSE ID: 08

Course Name : WEB PAGE DESIGNING
Course Code : ITE107
Course Abbreviation : EWPD

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : < nil >

Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	02	04
Practical	02	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	--	i. 25 marks for each practical ii. One PST of 25 marks	--	As per Proforma-VI	As per Proforma-V	
Marks	--	--	--	25	75	100

RATIONALE:

Across the world Internet users are increasing day by day. Millions of users are now creating personal Web sites. The subject gives conceptual and operational details of internet. In IT world, creating web pages and web sites has become a new emerging trend which requires knowledge of HTML and JavaScript. It is a practical oriented subject which will enable student to develop Web sites.

OBJECTIVES:

The student will be able to

1. Design simple Web pages - using HTML and its features
2. Organize information using Tables, collect information from users using forms & present information using Frames.
3. Use style sheets to gain full control of formatting within Web page.

4. Design dynamic web pages using JavaScript.
5. Embed multimedia to Web pages.
6. Integrate all above to develop Web sites.

CONTENT:

Sr. no	Topics Subtopics	Teaching (Hours)
1	<p>INTRODUCTION TO HTML</p> <p>1.1 Terminologies used in Web Design: WWW, Web site, Web page, Web Server, Web Browser, Search Engine, URL, Domain, Hyperlink</p> <p>1.2 Components of HTML: Tags – closed tags and open tags, Attributes, Elements.</p> <p>1.3 Structure Tags: !DOCTYPE, HTML, HEAD, TITLE, BODY tags.</p> <p>1.4 Block Level Elements : Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Address.</p> <p>1.5 Text Level Elements : Bold, Italic, Teletype, Underline, Strikethrough, Superscript, subscript.</p> <p>1.6 Horizontal Rules.</p> <p>1.7 Special characters.</p> <p>1.8 Adding comments</p> <p>1.9 The Meta tag.</p>	4
2	<p>CREATING LISTS</p> <p>2.1 Ordered Lists: tag and its attributes</p> <p>2.2 Unordered Lists: tag and attributes</p> <p>2.3 Definition Lists: <DL> tag</p> <p>2.4 Nested Lists</p>	2
3	<p>LINKING HTML DOCUMENTS</p> <p>3.1 URL : Types of URLs, Absolute URLs, Relative URLs</p> <p>3.2 The Anchor Tag and its attributes</p> <p>3.3 Linking :</p> <p style="padding-left: 20px;">3.3.1 To document in the same folder.</p>	3

Sr. no	Topics Subtopics	Teaching (Hours)
	<p>3.3.2 To document in the different folder.</p> <p>3.3.3 To document on the web.</p> <p>3.3.4 To specific section within the document.</p> <p>3.3.5 Inserting E-mail links</p>	
4	<p>IMAGES AND COLORS</p> <p>4.1 Image formats : gif, jpeg, png</p> <p>4.2 The inline image: an IMG tag, alternate text, image alignment, HSPACE, VSPACE, wrapping text, height and width of images.</p> <p>4.3 Image as a link.</p> <p>4.4 Image maps</p> <p>4.5 Colors and Backgrounds</p> <p>4.5.1 The text color: color attribute of FONT tag, text attribute of BODY tag.</p> <p>4.5.2 Background color: bgcolor attribute of BODY tag.</p> <p>4.5.3 Background images: background attribute of BODY tag.</p> <p>4.5.4 Changing link colors: link, alink, vlink attributes of BODY tag.</p>	2
5	<p>TABLES</p> <p>5.1 Creating basic tables: TABLE, TR, TH, TD tags.</p> <p>5.2 Formatting tables: border, cellpadding, cellspacing, width, height, align, bgcolor attributes.</p> <p>5.3 Adding captions: CAPTION tag.</p> <p>5.4 Formatting contents in the table cells : align, valign, bgcolor, height, width, nowrap attributes.</p> <p>5.5 Spanning rows and columns: rowspan and colspan attributes.</p>	3
6	<p>FRAMES</p> <p>6.1 Introduction to frames : What is frame?, Advantages and disadvantages of using frames.</p> <p>6.2 Creating frames :</p> <p>6.2.1 FRAMESET tag and its attributes</p> <p>6.2.2 FRAME tag –name, frameborder, marginheight, marginwidth, src, noresize, scrolling attributes.</p>	4

Sr. no	Topics Subtopics	Teaching (Hours)
	6.3 Use of NOFRAME tag 6.4 Frame targeting	
7	FORMS 7.1 Creating basic form: FORM tag, action and method attributes. 7.2 Form fields: Single line text field, password field, multiple line text area, Radio buttons, check boxes. 7.3 Pull down menus: SELECT and OPTION tags. 7.4 Buttons: Submit, Reset and generalized buttons. 7.5 Formatting technique: Using table to layout form.	3
8	STYLE SHEETS 8.1 Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style. 2.3 Style sheet properties: font, text, box, color and background properties.	3
9	INTRODUCTION TO JAVASCRIPT 9.1 Benefits of JavaScript 9.2 Embedding JavaScript in HTML document. 9.3 Variables, Constants, Adding comments. 9.4 Operators: Assignment, Arithmetic and Comparison operators. 9.5 Control structures and looping: if, if..else, for, for..in, while, do..while, break and continue. 9.6 Event handling : onClick, onMouseOver, onMouseOut, onSubmit, onReset, onFocus, onBlur, onSelect events	6
10	MULTIMEDIA 10.1 Text animation with MARQUEE element 10.2 Using animated gif files in a web page 10.3 Using EMBED tag to add multimedia	2
TOTAL		32

Laboratory experiences and related skills developed.

Sr. no	Laboratory experience	Skills developed
1	To study basics of web designing and components of HTML	<ol style="list-style-type: none"> 1. To understand basic terminologies used in web designing 2. To understand components of HTML 3. To write a simple web page using HTML
2	To design a web page and apply text level tags.	<ol style="list-style-type: none"> 1. To add various text level tags in web pages
3	To design a web page and apply block level tags.	<ol style="list-style-type: none"> 1. To add various block level tags in web pages
4	To include horizontal rules with various attributes and special characters in web page.	<ol style="list-style-type: none"> 1. To understand use of <HR> tag and its attributes. 2. To understand adding special characters in a web page
5	To include ordered and unordered lists in a web page.	<ol style="list-style-type: none"> 1. To understand use of tag and its attributes. 2. To understand use of tag and its attributes. 3. To understand <DL > tag
6	To design a web page with various links.	<ol style="list-style-type: none"> 1. To add hyperlinks - <ul style="list-style-type: none"> • To document in the same folder. • To document in the different folder. • To document on the web. • To specific section within the document.
7	To include images with different alignments and wrapped text in web page, also include image as link in a web page.	<ol style="list-style-type: none"> 1. To understand concept of various attributes of tag. 2. To understand concept of image as a hyperlink
8	To design a web page to set background color, background image, document wide text color, different text color for different paragraph and set colors for links, active links and visited links.	<ol style="list-style-type: none"> 1. To apply background color for a web page. 2. To use an image as a background for a web page. 3. To set color for the text on web page. 4. To set different text colors for different paragraphs 5. To set colors for hyperlinks, active links and visited link

9	To create HTML table, format contents in a table cells and span the rows and columns.	<ol style="list-style-type: none"> 1. To understand use of <TABLE> tag and its attributes. 2. To understand formatting contents in tables on web page 3. To understand using colors in tables on web page 4. To understand merging cells in tables on web page
10	To create basic frameset and format the frames within the frameset using different attributes, To design a web page using frame targeting.	<ol style="list-style-type: none"> 1. To understand use of frames in layout of web page. 2. To understand use of <FRAMESET> tag and its attributes 3. To understand use of <FRAME> tag and its attributes 4. To understand frame targeting.
11	To create a basic form using form controls	<ol style="list-style-type: none"> 1. To understand use of <FORM> element and its attributes. 2. To understand form input controls like text field, password field and multiple line text field controls. 3. To use pull down menu in web pages 4. To use buttons in web pages
12	To use table to layout form with the different form controls and generalized buttons.	<ol style="list-style-type: none"> 1. To understand concept of <TABLE> tag and its attributes. 2. To understand use table to layout form with different form controls
13	To create web page and apply style sheet properties (Font, text and box properties)	<ol style="list-style-type: none"> 1. To understand the concept of style sheet. 2. To understand the concept of adding style sheets to a document, linking to a Style Sheet, embedding and importing style sheets. 3. To use font, text and box properties of style sheets
14	To create a web page to get water mark effect using style rules.	<ol style="list-style-type: none"> 1. To use color and background properties of style sheets.
15	To write java script using control structure and looping.	<ol style="list-style-type: none"> 1. To understand use of variables, constants, functions in JavaScript 2. To apply conditional statements like – if..else and its variants, switch statements in script code 3. To apply looping constructs – for, while, do..while in script code

16	To write java script using event handlers.	<ol style="list-style-type: none"> 1. To understand concept of event handling in JavaScript. 2. To use events - onClick, onMouseOver, onMouseOut, onSubmit, onReset, onFocus, onBlur, onSelect events in JavaScript
17	To apply text animation and to embed animated GIF files in a webpage.	<ol style="list-style-type: none"> 1. To understand the use text animation using <MARQUEE> element in a web page. 2. To understand including animated GIF file in a web page. 3. To embed multimedia using <embed> tag.
18	Mini Project	<p>Groups of 4-5 students shall assign one project. Each group should design a web site. Example topics are given below:</p> <ol style="list-style-type: none"> 1. Website of any educational Institute 2. Website of a shopping mall 3. Website of your department 4. Website of e-greetings 5. Website of a hospital 6. Website of your town / village 7. Website of Indian recipes 8. Website of jewellery designs 9. Website of a travel agency 10. Website of online books 11. Website of a bank 12. Website of songs 13. Website of a manufacturing company

Criteria for Continuous Assessment of Practical work and Progressive Skill Test:

Sr. no	Criteria	Marks allotted
1	Attendance at regular practical	5
2	Preparedness for practical	5
3	Presentation	5
4	Logical Thinking and Approach	5
5	Application	5
	Total	25

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Technical ability	20
2	Communication skill	10
3	Logical approach	20
	TOTAL	50

*Assessment as per proforma II

Instruction strategies:-

1. Lectures / Discussion
2. Laboratory experiences and laboratory interactive sessions.
3. Regular Home Assignments.
4. Group tasks.

RESOURCES:-

TEACHING AND LEARNING RESOURCES, INCLUDING REFERENCES:

- 1) Chalk-board.
- 2) Presentation Slides
- 3) Demonstrative video files

REFERENCE MATERIAL :

a) Books :

1. The Complete Reference HTML – Thomas A. Powell
2. HTML Black Book – Steven Holzner
3. HTML, DHTML, JavaScript, Perl, CGI – Ivan Bayross

b) Websites

1. <http://www.w3schools.com/html/>
2. <http://www.html.net/tutorials/html/>
3. <http://www.tutorialspoint.com/javascript/>

COURSE ID: 09

Course Name : BASIC ELECTRONICS
Course Code : ITE108
Course Abbreviation : EBTX

TEACHING AND EVALUATION SCHEME:

Prerequisites: NIL

Teaching Scheme:

Scheme Component	Hours/week	Credits
Theory	03	05
Practical	02	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Oral Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i. 25 marks for each practical ii. One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma-II	
Marks	20	--	80	--	50	150

Rationale:

Although industrial electronics is specialized field of electronics engineering, a grasp of certain fundamental principles and concepts are essential pre- requisitions for it. This subject deals with the most basic devices and circuits on which the further development of subject depends.

Course Aims:

- 1) State the principles and operations of various electronic devices.
- 2) Use electronic devices in different circuits
- 3) To built up simple electronic circuits
- 4) Describe the formation of PN junction.

- 5) Draw the characteristics of basic components like diode, transistor etc.
- 6) Test diode and transistors.
- 7) Read the data sheets of diode and transistors.

Section-I

Sr. No.	Topics	Teaching hours	Marks
1.	<p>Semiconductor Diode</p> <p>1.0 Conductor , Insulator, semiconductor</p> <p>1.0.1 Intrinsic semiconductor : Si , Ge</p> <p>1.0.2 Doping</p> <p>1.0.3 Extrinsic semiconductor : P type , N type</p> <p>1.1 P.N. junction diode – Ge & Si</p> <p>1.1.1 Constructional features.</p> <p>1.1.2 Operating principle.</p> <p>1.1.3 Characteristics.</p> <p>1.1.4 Applications.</p> <p>1.2 Zener diode</p> <p>1.2.1 Constructional features.</p> <p>1.2.2 Operating principles.</p> <p>1.2.3 Characteristics</p> <p>1.2.4 Applications</p>	09	15
2.	<p>Rectifier, Filter</p> <p>2.0 Half wave rectifier - working, Ripple factor, Efficiency Consideration.</p> <p>2.1 Full wave rectifier - classification, working ripple factor, efficiency consideration.</p> <p>2.2 Filter - study of shunt capacitor, series inductor, LC, Filter., CLC filter</p>	06	10

3.	<p>Bipolar Junction Transistor(BJT)</p> <p>3.0 Introduction.</p> <p>3.1 Constructional features.</p> <p>3.2 Operating principles of NPN & PNP Transistor</p> <p>3.3 Transistor configurations & Modes of operation</p> <p>3.4 Transistor input & output characteristic of CE & CB configuration.</p> <p>3.5 Q Point & stability</p> <p>3.6 DC & AC Load Line</p> <p>3.7 Transistor Biasing Methods-Circuit ,Equations, Advantages & disadvantages Of</p> <p>3.7.1 Fixed Bias Circuit</p> <p>3.7.2 Fixed Bias with Emitter Resistor</p> <p>3.7.3 Collector to Base Bias Circuit</p> <p>3.7.4 Voltage Divider Bias Circuit</p>	09	15
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Section –II

Sr. No.	Topics	Teaching hours	Marks
4.	<p>Single And Multistage amplifier</p> <p>4.0 Study of single stage amplifier.</p> <p>4.1 Multistage BJT amplifier.</p> <p>4.2 Study of RC coupled amplifier</p> <p style="padding-left: 20px;">4.2.1 Working</p> <p style="padding-left: 20px;">4.2.2 Frequency response curve.</p> <p style="padding-left: 20px;">4.2.3 Bandwidth and applications.</p>	06	10
5	<p>Field Effect Transistor (FET)</p> <p>5.0 Classification of FET</p> <p>5.1 Study of JFET</p> <p style="padding-left: 20px;">5.1.1 Construction details.</p> <p style="padding-left: 20px;">5.1.2 Working principle</p> <p style="padding-left: 20px;">5.1.3 Characteristics</p> <p style="padding-left: 20px;">5.1.4 JFET parameters</p> <p>5.2 Comparison between JFET and BJT</p> <p>5.3 Study of MOSFET:-Types,symbol,working principle, applications</p>	09	15

6.	Regulated Power Supply 6.1 Block diagram of Regulated power supply. 6.2 Zener diode as a voltage regulator 6.3 Transistor Series Voltage Regulator 6.4 Transistor Shunt Voltage Regulator 6.5 Study of IC 78xx & IC 79xx series of voltage regulators	09	15
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NOTE→For setting of question paper, marks per topic should be 1.5 times the allotted Marks

Specification Table for Question Paper of Theory Examination:

SR.NO.	Name of the Topic	Distribution Of Marks (level wise)			Total Marks
		Knowledge	Comprehension	Applications	
1	Semiconductor diode	08	05	02	15
2	Rectifier, filter	04	04	02	10
3	Bipolar junction Transistor(BJT)	10	02	03	15
4	Single & Multistage Amplifier	08	02	----	10
5	Field effect Transistor.(FET)	12	----	03	15
6	Regulated Power supply	08	05	02	15

Laboratory experiences and related skills developed.

Sr.no	Laboratory experiments	Skills developed
1	Characteristics of semiconductor junction diode.	1) Connect the various component as per the circuit diagrams using proper size wires 2) Write the forward & reverse voltage & current 3) Draw the forward & reverse characteristics
2	Characteristics of Zener diode.	1) Connect the various component as per the circuit diagrams using proper size wires 2) Write the forward & reverse voltage & current 3) Draw the forward & reverse characteristics
3	Zener diode as voltage regulator and regulation	1) Connect the various component as per the

	characteristics	circuit diagrams using proper size wires 2) Write the percentage of regulation
4	Input, Output characteristics of common base configuration.	1) Write input & output voltage & current 2) Make proper connection as per circuit diagram 3) Draw the input & output characteristics
5	Input, output characteristics of common emitter configuration.	1) Write input & output voltage & current 2) Make proper connection as per circuit diagram 3) Draw the input & output characteristics
6	Waveform observation, Vdc, ripple calculation, of half wave rectifier.	1) Make proper connection as per circuit diagram 2) Write Vdc & ripple voltage 3) To show the waveform on C.R.O.
7	Waveform observation, Vdc, ripple calculation of centre - tapped full wave rectifier	1) Make proper connection as per circuit diagram 2) Write Vdc & ripple voltage 3) To show the waveform on C.R.O.
8	Waveform observation, Vdc, ripple calculation of Bridge - full wave rectifier	1) Make proper connection as per circuit diagram 2) Write Vdc & ripple voltage 3) To show the waveform on C.R.O.
9	To Study RC coupled Amplifier	1) To observe the frequency response of RC coupled amplifier.
10	Static characteristics of FET	1) Make proper connection as per circuit diagram 2) Measure drain voltage & current and also measure Vgs & Vds draw characteristics

Instructional Strategies:

- 1) Lectures
- 2) Demonstration
- 3) Group discussion
- 4) Tutorial
- 5) Self learning.

Criteria for Progressive Assessment of Practical and skill test:

Particulars	Marks
1. Attendance	10
2. Correct figures/circuit diagrams/drawings	08
3. Proper observations and result table	08
4. Sample calculations with relevant formulae	08
5. Proper graphs and phasor diagrams	08
6. Procedure/workmanship/safety	08

Total	50
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Reference Books:

- 1) Electronics Devices & Circuits - By A. Motershed
- 2) Electronics Principles - By Malvino
- 3) Principles of Electronics - By V. K. Mehta.
- 4) Applied Electronics - By G. K. Mithal
- 5) Basic Electronics - By B. L. Theraja.

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Correct figures / diagrams/ Flow chart	20
2	Result table / calculations / graphs	20
3	Safety / use of proper tools / workmanship	10
	Total	50

Assessment at semester end practical exam as per Pro-forma II.

COURSE ID: 10

Course Name : ELEMENTS OF PRACTICAL ELECTRICITY
Course Code : ITE110
Course Abbreviation : EEPE

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : < nil >

Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	1	3
Practical	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Oral Examination (Internal)	
Details of Evaluation	--	i. 25 marks for each practical ii. One PST of 25 marks	--	--	As per Proforma-II	
Marks	--	--	--	--	50	50

Rationale:

A person working in any field needs to be aware of the mode / ways of application of electricity in his field. He must be well conversant with the basic skills of maintaining the supply system to the machines used by him. This becomes much more important for an information technologist as this reduces his dependence on others for trivial works of electricity to be carried out such as replacing the fuse, calculating the load, inspecting a power supply, deciding wiring systems along with the components & load requirements etc. This course arms the candidate with the basic knowledge & skills in using electricity and related components for his machines such as computers and related devices.

Objectives:

The students will:

1. Identify the required type of supply systems.
2. Understand the working of power supplies including UPS & inverters.
3. Know the application of electricity with reference to its effects as magnetic heating.
4. Understand the importance of Earthing & its requirements.
5. Understand Voltage & Current sources.
6. Understand Kirchoff's laws.
7. Understand Maximum power transform theorem.
8. Calculate electric load to decide the required supply systems capacity and select required components.
9. Know the use of simple measuring instruments used.
10. Understand the protection needs of computers & related devices.

Course Contents:

Sr. no	Topics Subtopics	Teaching (Hours)
1	Fundamentals :- 1.1. Heating & magnetic effects of electric current. 1.2. Application of the above comparing devices such as HD, FD, CD (Photo effect). 1.3. Ohms law. 1.4. Resistor, Capacitor – symbol, properties 1.5. Resistance & Capacitance.	2
2	D.C. Circuits / Devices :- 2.1 Voltage & Current source. 2.2 Kirchoff's laws, Maximum power transfer Theorem. 2.3 Magnetic coils – their field (Magnitude & direction).	10
3	A.C. Circuits / Devices :- 3.1 Concepts of Alternating quantity. 3.2 Cycle, Frequency, Period, Phase, Max-value, RMS value & Average value. 3.3 Concepts of reactance (Inductive & Capacitive) 3.4 Concept of impedance, power factor 3.5 Simple calculations.	10

Sr. no	Topics Subtopics	Teaching (Hours)
4	Electrical supply systems:- 4.1 D. C. systems. 4.2 Single phase A.C. 4.3 Three phase A.C.,- 3 wire, 4 wire	½
5	Wiring systems & Earthing:- 5.1 Types of wiring and their applications. 5.2 Selection of wiring systems & wires for computer systems. 5.3 Protective devices for the systems. 5.4 Importance of Earthing for equipment's. 5.5 Implementation of Earthing systems. 5.6 Components of Earthing systems.	2
6	Measuring Instruments:- 6.1 Voltmeter, Ammeter, Multimeter- applications. 6.2 Wattmeter, (Power measuring circuits for single & three phase loads) 6.3 Energymeter, - application (1 phase & 3 phase).	2/1
7	Single phase Transformer (small Transformer) 7.1 Principle. 7.2 Construction of small transformer. 7.3 Application for the above.	2
8	Supply related systems & their need:- 8.1 Stabilizers (specification selection) 8.2 Voltage regulators (specification selection) 8.3 SMPS (specification selection) 8.4 Inverters (specification selection) 8.5 UPS – online & offline (specification selection)	2
9	Electric motors:- 10.1 Motors used in computers & related peripherals such as stepper motors etc. 10.2 Introduction to induction motors of single phase & three phase type along with their applications.	2

Laboratory work & skills

1	Verify Ohm's law
2	Verify Kirchoff's current law
3	Verify Kirchoff's voltage law
4	Measure resistance, inductance & impedance of given coil using Voltmeter, Ammeter & Multimeter.
5	Verify Maximum power transfer theorem.
6	Study the supply systems: - DC, AC – single & three Phase.
7	Measure power in DC & AC circuit using, Wattmeter.
8	Connect energymeter in single-phase circuit.
9	Prepare specification of SMPS, Inverter, UPS (any one)
10	Suggest required systems / type of wiring for given requirements.

Criteria for assessments of weekly practical work

Punctuality / Attendance	05
Diagrams / neatness	05
Calculation / observations	10
Workmanship / Safety / Habits	05

Instruction strategies:-

- Lectures / Discussion
- Regular Home Assignments.
- Lab. Experiences / works
- Group tasks.

Resources:-

- Chalk – board
- Charts
- Models
- Books
- Basic Electrical Engg. (V. N. Mittal)
- Electrical Technology (Edward Hughes)

Criteria for assessment at semester end oral exam:

Sr. no	Criteria	Marks allotted
1	Logical concepts of electricity	5
2	Ability to suggest application of wirings.	10
3	Clarity of ideas for selection of power supplies, instruments, machines etc.	15
4	Safety awareness with special reference to supplies	20
		50

*Assessment as per proforma II :includes the marks of Continuous assessment (TW), Progressive skill test and term end oral/practical.
