DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO. /SU./Engg./24/2016

It is hereby inform to all concerned that, on the recommendation of the Committee, the Hon'ble Vice-Chancellor has accepted the revised syllabus of [1] First Year of Engineering (B.E.) and Syllabus of [2] Third Year B.Tech. in Electrical Engineering and Curriculum under Choice Based Credit and Grading System in [3] MCA Second Year in the Faculty of Engineering & Technology in his emergency powers under Section-14[7] of the Maharashtra Universities Act, 1994 on behalf of the Academic Council.

This is effective from the **Academic Year 2016-2017** and onwards.

These syllabi are also available on the University website www.bamu.ac.in

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO. SU/ENGG. /2016/4605-36
Date:- 06-08-2016.

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Director,
Board of College and
University Development.

Copy forwarded with compliments to:-

1] The Principals of concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.

Copy to :-

1] The Controller of Examinations,
2] The Section Officer, [Engineering Unit],
3] The Programmer [Computer Unit-1] Examinations,
4] The Programmer [Computer Unit-2] Examinations,
5] The Public Relation Officer,
6] The In-Charge, E-Suvidha Kendra, [Professional Unit], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr. Babasaheb Ambedkar Marathwada University,
7] The Record Keeper.

N.B. : All are informed that to download a copy of curriculum from the above website.

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JS*/-060816/-

Revised Proposal for approval of scheme for the students taking admission for the first year in engineering from year 2016-17 following choice based credit system (CBCS).

CHOICE BASED CREDIT SYSTEM
CURRICULUM

UNDER GRADUATE PROGRAMME

Bachelor of Engineering

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Engineering and Technology
Proposed Structure 2016-17
FE(All)

Sub.Code	Semester-I	Contact Hrs/Week				Examination Scheme						Duration of Theory Exam
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	
BSH101	Engineering Mathematics-I	4	-	-	4	20	80	-	-	100	4	3
BSH102 / BSH 103	Engineering Physics / Engineering Chemistry and Environmental Science	4	-	-	4	20	80	-	-	100	4	3
MED 104	Engineering Graphics	4	-	-	4	20	80	-	-	100	4	4
EED 105	Basic Electrical Engineering	4	-	-	4	20	80	-	-	100	4	3
CED 106	Basic Civil Engineering	2	-	-	2	10	40	-	-	50	2	2
CSE 107	Computer Fundamentals -1	2	-	-	2	10	40	-	-	50	2	2
BSH121 / BSH 122	Lab-I/Lab-II Engineering Physics / Engineering Chemistry and Enviornmental Science	-	-	2	2	-	-	50	-	50	1	
MED123	Lab-III Engineering Graphics	-	-	2	2	-	-	50	-	50	1	
EED 124	Lab-IV Basic Electrical Engineering	-	-	2	2	-	-	50	-	50	1	
CED 125	Lab-V Basic Civil Engineering	-	-	2	2	-	-	50	-	50	1	
CSE 126	Lab-VI Computer Fundamentals-I	-	-	2	2	-	-	50	-	50	1	
MED 127	Lab-VII Workshop Practice -I	-	-	2	2	-	-	50	-	50	1	
		20	0	12	32	100	400	300	-	800	26	

Sub.Code	Semester-II	Contact Hrs/Week				Examination Scheme						Duration of
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	Theory Exam
BSH 151	Engineering Mathematics-II	4	-	-	4	20	80	-	-	100	4	3
BSH 102 /BSH 103	Engineering Physics / Engineering Chemistry and Enviornmental Science	4	-	-	4	20	80	-	-	100	4	3
CED 152	Engineering Mechanics	4	-	-	4	20	80	-	-	100	4	3
MED 153	Basic Mechanical Engineering	4	-	-	4	20	80	-	-	100	4	3
ECT 154	Basic Electronics Engineering	2	-	-	2	10	40	-	-	50	2	2
CSE 155	Computer Fundamentals -2	2	-	-	2	10	40	-	-	50	2	2
BSH 121 / BSH 122	Lab-I/Lab-II Engineering Physics / Engineering Chemistry and Enviornmental Science	-	-	2	2	-	-	50	-	50	1	
CED 171	Lab-VIII Engineering Mechanics	-	-	2	2	-	-	50	-	50	1	
MED 172	Lab-IX Basic Mechanical Engineering	-	-	2	2	-	-	50	-	50	1	
ECT 173	Lab-X Basic Electronics Engineering	-	-	2	2	-	-	50	-	50	1	
CSE 174	Lab-XI Computer Fundamentals -2	-	-	2	2	-	-	50	-	50	1	
MED 175	Lab-XII Workshop Practice -II	-	-	2	2	-	-	50	-	50	1	
		20	0	12	32	100	400	300		800	26	

FACULTY OF ENGINEERING

First Year Engineering

Semester-I

MED127, Lab- VII, WORKSHOP PRACTICE –I

Teaching scheme: practical 2 hours **Examination scheme:** Term work 50 marks.

COURSE CONTENT

- **Study of measuring instruments:** Study of the measuring instruments and their applications, along with actual measurement, used in a general workshop, like Vernier caliper, outside micrometer screw gauge, Inside micrometer, Vernier height gauge, Depth gauge, Dial gage and its application, combination square, thread gauge, spirit level. Study application of each section.
- **Fitting:** Understanding what is Fitting and its importance in finishing and assembly. Study of all the fitting tools, files and purpose of each operation of fitting.

  Prepare one job involving various filing, marking and finishing operations, on M.S. flat job, per student.
- **Joining processes**: Study shielded metal arc welding, MIG welding, gas welding and spot welding equipments and their practical applications, filler metals, fluxes. Welding techniques, . process selection. Need of edge preparation and the general inspection.

  Prepare one simple job having combined lap, butt and angle joints using arc welding and one joint by gas welding or brazing and one on spot welding, per student.
- **Black Smithy**. Study of importance of smithy. Study all the smithy tools, forging temperatures and smithy operations.

  Prepare one job by each student involving simple smithy operations like change of cross section, taper and bending operations. (Round to square section, taper, hook, chain link, ring or any simple job involving simple operations.) one job per student.

Term work shall consist of submission of:

- File containing the write-up chapter-1and principle, tools, operations and application of the three sections
- Workshop Diary in regular format which should have the record of job drawing, tools used, operations to be performed on the job, dates etc. duly certified by each Section Instructor and the Workshop Superintendent.
- Jobs completed in the practical hours in each section. (2,3,4)

Assessment of the term work shall be done by the Section Instructor and the Workshop Superintendent..

Recommended books:

- Workshop Technology, vol I, by Hazra Chaudhury; Media Promotors & Pub
- Workshop Technology, vol I, by Raghuvanshi; Dhanpatrai and Sons.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering
Semester-I/II
BSH102: ENGINEERING PHYSICS

Teaching Scheme	**Examination Scheme**
Lectures 4 Hrs/week	Theory 80 Marks
	Class Test 20 Marks
	Duration of Theory paper 3Hrs.

OBJECTIVES:

1. The syllabus of Engineering Physics highlights the basic concepts of Physics as applied to all branches of Engineering.
2. With the knowledge of Physics, basic principles of Engineering can be understood easily.
3. To acquaint students with modern techniques in Physics which can be applied in Engineering field

COURSE CONTENT:

Electron optics – Positive rays-production and properties, Determination of q/m by Thomson's Parabolic method, Separation of isotopes by Bain bridge mass spectrograph, Aston's mass Spectrograph, Electron refraction - Bethe's Law, Cathode ray oscilloscope – Block diagram ,Cathode ray tube (CRT) , Construction and working- Time base circuit and trigger circuit and Applications of CRO.

X- RAYS : Continuous and characteristic spectra, Diffraction of X-rays, Bragg's law, Bragg's Xray spectrometer,Applications of X-rays,Compton'seffect, Derivation for Compton Shift. **(8Hrs)**

Unit2:OPTICS:

INTERFERENCE –Appearance of Newton's rings by reflected light, Expression for diameter of dark And bright ring, Engineering applications of interference 1)Determination of refractive index of liquid 2)Testing of optical flatness,

Michelson's interferometer and it's application for determination of Refractive index of thin film.

DIFFRACTION-Diffraction of light, Theory of Plane Transmission grating, Resolving power of diffraction grating .

POLARISATION- Quarter wave plate and half wave plate, Production and detection of plane, circularly, elliptically polarized light , Optical activity, specific rotation, Laurentz's half shade polarimeter, photo elasticity. **(6 Hrs)**

Unit 3:SUPERCONDUCTIVITY AND MAGNETISM

Superconductivity-Introduction, critical magnetic field ,Zero resistivity ,Meissner effect, Isotope effect, type – I, type-II superconductor, BCS Theory, applications of superconductor –Josephson junction , SQUID.

Magnetism: Introduction, Magnetic Susceptibility ,Properties of dia,para and ferro magnetic materials, Magnetic domain and Hysteresis loop , Applications of Magnetic materials **(6 Hrs)**

Unit 4: SEMICONDUCTORS AND MODERN PHYSICS: Semiconductors - Introduction , Energy band structure of intrinsic and extrinsic semiconductors, Fermi energy , Fermi – Dirac distribution function , Position of Fermi level in intrinsic and extrinsic semiconductor and its variation with temperature (with derivations), Hall effect, Hall coefficient.

Modern physics –Heisenberg's uncertainty principle, Experimental illustration of uncertainty principle, Schrodinger time dependent and time independent wave equation, physical significance of wave function Ψ.

Atomic structure –Zeeman effect – Classical expression for Zeeman shift . Raman effect – derivation for Raman shift. **(6Hrs)**

Unit 5:THEORY OF LIGHT AND SOUND:

LASER- Properties of LASER , Interaction of radiation with matter ,spontaneous and stimulated emission, Population inversion, Pumping mechanism (three level pumping, four level pumping),Construction and working of Ruby laser and Helium - Neon gas laser, Semiconductor laser .

Fiber optics-Basic structure and classification of optical fiber, Acceptance angle , acceptance cone ,Numerical aperture, ,applications of optical fiber .

Acoustics - Echo ,Reverberation and reverberation time, Absorption coefficient, Sabine's formula , Acoustical design of a hall, Acoustical materials.

Ultrasonic - Limits of audibility , Properties of ultrasonic waves, Production of ultra sonic waves by piezoelectric & magneto striction method, Applications of ultrasonic waves. **(8 Hrs)**

Unit 6:NANOTECHNOLOGY

Introduction, Properties of nano particles, Synthesis of Nano particles – Ball Milling , Sputtering , Sol gel technique, Laser vaporization ,electro deposition and Chemical vapour deposition, Applications.

Carbon Nano Tube (CNT)- Introduction, Types of CNT, Important Properties – Electric, Magnetic, Mechanical , Applications **(6Hrs)**

TEXT BOOKS:

1. Engineering physics- Gaur and Gupta, S.Chand Publication
2. Engineering physics - Avadhanalu and Kshirsagar, S.Chand Publication

REFERENCE BOOKS:

1. Fundamentals of optics-Jenkins and White, McGraw Hill Publication
2. A Text Book Of Optics – Subrahmanyam, Brijlal, S. Chand Publication
3. Fiber optic Communication- D.C.Agrwal. Wheeler Publication ,New Delhi
4. Fiber optic communication-Keiser. McGraw Hill Publication
5. Engineering physics- Hitendra K Malik ,A.K.Singh ,Tata McGraw Hill Education Private Limited,New Delhi
6. Essential University Physics – Volume – 1and 2 – Richard Wolfson ,Pearson , Noida
7. Modern Physics – B.L.Theraja – S. Chand and Company Ltd.,Ram Nagar ,New Delhi.
8. Engineering Physics – Dattu R Joshi - Tata Mc-Graw Hill Education Private Limited
9. Nanotechnology, Principles and Practices – Dr. S.K. Kulkarni, Capital Publishing Co., New Delhi.

Section A - Unit 1, 2, 3

Section B - Unit 4, 5, 6

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I/II

BSH121: LAB I: ENGINEERING PHYSICS

Teaching Scheme	**Examination Scheme**
Practical 2 Hrs/week	Term work 50 Marks

Term Work.

Term work shall consists of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment.

Minimum ten experiments from the list of experiments as given below

1. e/m by Thomson's method.
2. Determination of radius of curvature of plano- convex lens by Newton's ring.
3. Determination of wavelength by diffraction grating.
4. Resolving power of telescope.
5. Study of CRO (amplitude, frequency, phase measurement).
6. Specific rotation of sugar solution by Laurent's half shade polarimeter.
7. Determination of electronic charge by Millikan's oil drop experiment.
8. Determination of band gap of a semiconductor.
9. Semiconductor diode characteristics.(Ge Si zener LED)
10. Transistor characteristics-CE configuration
11. Study of solar cell characteristics.
12. Study of photocell characteristics.
13. Hall effect and Hall coefficient.
14. Wavelength of laser by diffraction grating.
15. Transistor as an amplifier.

Semester-I
First Year Engineering
BSH101: ENGINEERING MATHEMATICS- I

Teaching Scheme
Lectures 4 Hrs/week

Examination Scheme
Theory 80 Marks
Class Test 20 Marks
Duration of Theory paper 3Hrs.

Objectives:
1) To develop Logical understanding of the subject.
2) To develop mathematical skills so that students are able to apply mathematical methods and principles in solving problems from different engineering fields.
3) To inculcate computational skills.

Unit 1:
Matrices-I: Rank of a matrix, Canonical and Normal form of a matrix, Consistency of the system of linear equations (homogeneous and non homogeneous equations). (5 Hours)

Unit 2:
Matrices-II: Characteristic equation of Matrix, Eigen values and Eigen vectors, Cayley-Hamilton Theorem, Linear dependence and independence of vectors, Linear Transformations, Orthogonal Transformations. (5 Hours)

Unit 3:
Complex Numbers with Applications: Geometrical Representation of a Complex Number, Standard forms of Complex Number, De'Moivre's Theorem, Roots of Complex Number. Complex Functions: Circular and Hyperbolic function, Relation between Circular and Hyperbolic functions, Inverse Hyperbolic functions, Separation into Real and Imaginary parts of complex functions, Logarithm of Complex Numbers. (10 Hours)

Unit 4:
Successive differentiation: N^{th} derivative of standard functions, Taylor's & Maclaurin's theorem, Expansion of functions using i) standard series ii) method of differentiation & integration. Indeterminate forms. Convergence of power series using Ratio Test, Comparison Test, Cauchy's n^{th} root Test. (10 Hours)

Unit 5:
Partial Differentiation: Partial Derivatives, Total Differentiation, Euler's Theorem on Homogeneous Functions, Change of Independent Variables. (5 Hours)

Unit 6:
Applications of Partial Differentiation: Jacobian, chain rule, Maxima and Minima of Functions of two variables, Lagrange's method of undetermined multipliers. (5 Hours)

Note: All Theorems are without proofs.

TEXT BOOKS:
1. A Text Book of Engineering Mathematics (Volume-I, II), P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2. Higher Engineering Mathematics by B. S. Grewal, Khanna Publications, New Delhi.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics by H.K. Das, S. Chand & Company.
2. Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill).
3. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd.
4. Engineering Mathematics by Babu Ram, PEARSON
5. Engineering Mathematics A Tutorial Approach by Ravish R Singh, Mukul Bhat ,Mc Graw Hill
6. A Textbook of Engineering Mathematics by N.P. Bali and Manish Goyal

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
First Year Engineering
Semester-I
MED104: ENGINEERING GRAPHICS
Teaching & Examination Scheme

Lectures: 4 Hrs/week
Class Test: 20 Marks

Theory: 80 Marks
Duration of Theory Examination: 4 Hrs.

Objective:

The objective of learning this subject at undergraduate level is to develop vision, imagination and presentation skill required for drawing and presentation of various engineering components in 2-D and 3-D

Unit	Contents	Duration	Nature
1	PROJECTIONS OF POINTS AND LINES: Projections of points and Projections of lines inclined to both the reference planes including HT & VT.	8 Hours.	Graphical
2	PROJECTIONS OF PLANES - Planes with surface inclined to both the planes. Planes such as- triangles, squares, rectangles, quadrilaterals, pentagon, Hexagon, circle, semicircle.	6 Hours.	Graphical
3	PROJECTION AND SECTION OF SOLIDS: Projections of solids with double inclination, Solids like prisms, cylinder, pyramid, cone, sphere, frustum, cube, and tetrahedron. Projections of geometrical solids cut by cutting plane inclined to one plane and determination of cutting plane angle from the given true shape of section.	8 Hours.	Graphical
4	ORTHOGRAPHIC PROJECTIONS:- Obtaining orthographic projections and sectional orthographic projections of different machine parts from the given 3D view.	6 Hours	Graphical
5	ISOMETRIC PROJECTIONS: - Introduction to isometric projections and isometric views. Drawing isometric views / isometric projections of simple machine parts.	6 Hours	Graphical
6	ENGINEERING CURVES: To draw Ellipse, Parabola, Hyperbola, Involute, Cycloid, Epicycloid, Hypocycloid, Helix, Archimedean Spiral, Drawing, Normal and tangents to curves MACHINE PARTS: Free hand sketching of Hexagonal headed nut and bolt, foundation bolts, screw thread forms.	6 Hours	Graphical

TEXT BOOKS:

1. Elementary Engineering Drawing N D Bhatt Charotar Publication House

REFERENCE BOOKS:

1. Engineering Drawing Dhananjay A. Jolhe Tata McGraw-Hill Education
2. Engineering Drawing Basant Agrawal C. M. Agrawal Tata McGraw-Hill Education
3. Engineering Drawing M. B. Shah, B. C. Rana Pearson Education India
4. A Text Book of Engineering Graphics M L Dhabhade Association of Technical Authors, Pune
5. Engineering Drawing B. V. R. Gupta, M. Raja Roy I. K. International Pvt. Ltd
6. A text book of Engineering Drawing R. K. Dhawan S. Chand and Co.
7. Engineering Drawing Mali & Chaudhary Vrinda Publishers.

PATTERN OF QUESTION PAPER

(Note: The theory paper of EG will include the detailed syllabus covered in EG Theory and Practicals)

SECTION A

1. Question no. 1. Projections of Straight Lines inclined to both the reference planes. (Line in First Quadrant only) for 13 marks
2. Question no. 2. Projections of Straight Lines inclined to both the reference planes. (Line in multiple quadrants with traces) for 13 marks.
3. Question no. 3. Projections of planes for 13 marks.
4. Question no. 4. Projections of solids for 14marks.
5. Question no. 5. Section of solids for 13 marks.

SECTION B

6. Question no. 6. Conversion of Isometric views into Orthographic Projections for 13 marks.
7. Question no. 7. Conversion of Orthographic Projections into isometric views / isometric projections for 13 marks.
8. Question no. 8. Conversion of Isometric views into Sectional Orthographic Projections 14 marks.
9. Question no. 9. Machine Parts (out of five bits three shall be solved) for 13 marks.
10. Question no.10. (a) and 10 (b) Engineering Curves (out of three bits any two shall be solved) 13 marks.

FACULTY OF ENGINEERING AND TECHNOLOGY
First Year Engineering
Semester-I
MED123: Lab III: Engineering Graphics
Practical Scheme

Practicals 2 Hrs/week Term work 50 Marks

OBJECTIVES:

• Understanding Spacing. • Understanding Scales, and Sizes of drawings. • Understanding methods of Standard Dimensioning. • Technical lettering. • Use of different lines with varying thickness and darkness.

TERM WORK Term work shall consist of compilation of A2 (594x420mm) (Half imperial) size drawing sheets as detailed below

Sheet No. 1: PROJECTIONS OF LINES: To draw at least four problems based on line inclined to both the planes, with following objectives,

1. Obtaining projections of line inclined to both the planes.
2. Determination of true length and inclinations of the line.
3. Locating traces of line and its use for obtaining true length and inclination of the line.

Sheet No. 2: PROJECTIONS OF PLANES: To draw at least two problems based on planes with double inclinations and following objectives.

1. Obtaining projections of planes of different (polygonal, circular, semicircular etc.) shapes having double inclinations.
2. Determination of true shape and inclinations of the plane.

Sheet No. 3: PROJECTIONS OF SOLIDS: To draw at least two problems based on solids with double inclination and following objectives.

1. Obtaining projections of different regular geometrical solids having double inclinations.
2. Understanding and showing hidden edges of the solids.
3. Determining the inclination of the axis of the solid.
4. Obtaining apparent inclinations in FV/TV.

Sheet No. 4: SECTION OF SOLIDS: To draw at least two problems based on geometrical solids cut by cutting planes inclined to one plane with following objectives.

1. Drawing section line view of the cutting plane in correct view.
2. Drawing sectional view and true shape of section.
3. Determining inclination of the cutting plane and for the given true shape.

Sheet No. 5: ORTHOGRAPHIC AND SECTIONAL ORTHOGRAPHIC PROJECTION: At least two problems to be solved on each orthographic projections and sectional orthographic projections with following objectives.

1. Reading the 3D drawings and converting it in 2D views.

Sheet No. 6: ISOMETRIC VIEWS: Solving at least one problem on each isometric views and isometric projection for simple machine parts with following objectives.

1. Reading the 2D drawings and converting it in 3D views.

Sketch Book: A sketch book to be prepared by the students containing problems on unit 6.

Assessment of term work shall be carried out by a pair of the examiner one shall be the subject teacher and another appointed by the Principal.

EED 105 BASIC ELECTRICAL ENGINEERING

Teaching Scheme:
Theory Lectures: 04 Hours/Week
Practical: 02 Hours/Week

Theory Exam – 80 Marks
Class Test – 20 Marks
Term Work – 50 Marks

Course Objectives:

1) To understand the basic knowledge of Electrical Engineering to the Students of all the disciplines of Engineering.

2) To make the Students familiar with the field of Electrical.

Unit 1: Fundamentals of Electrical Circuits (Theoretical Treatment only) (06 Hours)
Concept of emf, energy sources – ideal and practical, current and voltage sources and source conversion, Current and Voltage division formula, Resistance, Effect of Temperature on Resistance, Resistance Temperature Coefficient, Insulation Resistance, Capacitor, Charging and discharging of Capacitor, Time Constant, Types and Batteries of Cells, Lead-Acid Battery, Nickel-Cadmium Battery, Current Capacity and Battery rating.

Unit 2: DC Circuits (Theoretical and Numerical Treatment) (08 Hours)
Classification of Electrical Networks, Application of Kirschoff's laws, Study of Loop analysis method and Node analysis-Simple networks, Superposition Theorem, Thevenin's Theorem, Star-Delta Transformation conversion, Maximum power transfer theorem.

Unit 3: Electromagnetism (Theoretical Treatment only) (06 Hours)
Concept of mmf, Flux, Flux Density, Reluctance, Permeability and Field Strength-their units and relationships, simple series and parallel Magnetic circuits, comparison of electrical and magnetic circuits, force of current carrying conductor placed in a magnetic field, Fleming's left and right hand rule, concept of Magnetic hysteresis, Faraday's law of Electromagnetic Induction, Statically and dynamically induced emf, self and mutual inductance, Coefficient of Coupling, Energy stored in a magnetic field.

Unit 4: AC Fundamentals and Circuits (Theoretical and Numerical Treatment) (08 Hours)
Concept of generation of alternating emf-single phase and three phase, instantaneous, peak, average and RMS values of AC quantities, Frequency and Time period, Power factor, Form factor, Study of AC circuit consisting of pure Resistance, pure Capacitance, pure Inductance and corresponding V-I phasor diagrams and waveforms, Concept of Reactance and Impedance, Study of Series and parallel RL, RC and RLC circuits and resonance, Concept of Apparent, Real and Reactive Power and Power Factor and its importance.

Unit 5: Single Phase Transformer (Theoretical and Numerical Treatment) (06 Hours)
Construction, Principle of working, emf equation, Voltage and Current ratios, Losses, Definition of regulation and efficiency by direct loading method.

Unit 6: Electrical Utilities (Theoretical Treatment only) **(06 Hours)**

Types of wiring systems – House-wiring, Staircase wiring, Godown wiring, Significance of Earthing, Electrical safety precautions, Study of different types of lamps-CFL, CFT, W-LED-Construction, working and their rating, Metal Halide lamp, Electronic choke, Measuring Instruments-Multimeter, Sources of Electrical Power Generation - Conventional and Non-Conventional Power plants.

List of Text

1) Electrical Technology: B.L.Theraja and A.K. Theraja; S.Chand Publications
2) Basic Electrical Engineering: V.N.Mittal
3) Basic Electrical Engineering: S K Sahdev ; Pearson Publications
4) Fundamentals of Electrical Engineering: Ashfaq Hussain : DHANPAT RAI @ CO
5) Basic Electrical Engineering: C L Wadhwa; NEW AGE INT Publications

Reference Books

1) Theory and Problems of Basic Electrical Engineering: Nagrath Kothari; Tata Mc Graw Hill
2) Basic Electrical Engineering: V.K.Mehta
3) Elements of Electrical Technology: H.Cotton; CVS Publications
4) Electrical Safety, Fire safety engineering: S. Rao, Khanna Publications
5) Laboratory Manual for Electrical Circuits: David A. Bell (2000)

Theory question paper pattern for BEE is as follows.

Section A will consist of five questions (Q NO 1 to 5) based on unit 1, 2 and 3.

Section B will consists of five questions (Q NO 6 to 10) based on unit 4, 5, and 6.

From each section students are required to attempt three questions. Each section will carry 40 marks.

Q. No. 5 and Q. No. 10 are compulsory consisting of short questions or short notes based on respective units of the sections and will carry 12 marks each. Remaining questions will carry 14 marks each.

Distribution of marks for the questions will be based on the teaching hours of the respective units given in the syllabus.

EED 124 Lab 04 : BASIC ELECTRICAL ENGINEERING

Term Work:

The Term Work will be evaluated on the basis of continuous assessment, performance during the practical in the semester. The term work consists of a record of minimum eight experiments from the list given below:

List of Experiments

1) Study of House and Staircase wiring.
2) Study of Different types of lamps-Fluorescent type, CFL, High Intensity Discharge Lamp.
3) Study of Multimeter.
4) Study of Control Panel (Meter Board and Distribution Board)
5) Effect of temperature on resistance.
6) Measurement of power and energy in 1-phase circuit.
7) Verification of DC network theorems.
8) Measurement of Power Factor of R-L, R-C and R-L-C circuit.
9) Determination of efficiency of 1-phase transformer and verification of transformation ratio.
10) Study of safety precautions while working on Electrical Systems.
11) Study of Earthing methods and their need.

CED 106: Basic Civil Engineering

Teaching Scheme:
Lectures – 2 Hrs./ Week
Class Test: 10 Marks

Examination Scheme:
Theory Paper: 40 Marks (2 Hrs. Duration)

Unit 1: Building Planning and Construction: (7)

Branches of civil Engineering, Role of civil Engineer, Site selection for residential building, plinth area, carpet area, Floor Space Index, cost of building.

Classification, properties and uses of following engineering materials.

- Bricks b) Stones c) Aggregates d) Sand e) Cement f) Steel g) Concrete.

Loads coming on Structure, Types of construction a) Load bearing structure b) Framed Structure. **Substructure:** Functions of Foundation, safe, ultimate and net bearing capacity of soil, isolated footing, and combined footing.

Super structure: Typical cross section through load bearing wall. Basic requirements of various Components of building (Walls, Floors, Doors and windows, Stairs, & Roof).

Unit 2: Geographical Measurement and Transportation Engineering: (7)

Geographical Measurement: Definition, classification and Principles of surveying, measurement of distance by chain and tape, Prismatic compass, measurement of bearing and calculation of included angles, study and use of dumpy level, levelling staff, bench mark, determination of reduced levels by height of instrument method and rise and fall method.

Transportation Engineering: Various modes of transportation, their merits and demerits, Classification of roads, Rigid and Flexible pavements composite pavement, white topping etc. typical road section, Camber, width formation , carriageway, sight distance, numerical on sight distance.

Unit 3: Environmental and Water Resource Engineering: (6)

Environmental Engineering: Water demands; design period, per capita demand, Methods of forecasting population: Arithmetic increase, geometric increase and incremental increase method. Flow diagram of Water treatment plant and function of different unit.

Water Resource Engineering: Definition of watershed, Necessity of watershed management works. Different structures involved in watershed management. Roof top rainwater harvesting and ground water recharge. Necessity of irrigation and benefits of irrigation.

References:

- Anderson "Introduction to Surveying" Mc Graw Hill International Student Edition.

- Arora S.P. and Bindra S.P. "Building Construction", Dhanpat Rai and Sons, Delhi.
- Duggal A.K. "Surveying and Levelling", Vol-I, Prentice Hall of India
- Garg S.K. "Irrigation Engineering and Hydraulic Structures", Khanna Publishers, Delhi.
- Shah, Kale and Patki "Building Design and Drawing", TATA Mc Graw Hill
- Highway Engineering by " Justo Khanna.

Question paper should consist of five questions covering whole syllabus. Each question should consist of maximum two bits. Question one should be compulsory of ten marks remaining question of 15 marks each asking to attempt any two from remaining.

CED 125 LAB V: Basic Civil Engineering

Teaching Scheme:
Practical – 2 Hrs./ Week

Examination Scheme:
Term Work: 50 Marks

TERMWORK:

Term work shall consist of drawing on A-3 size drawing sheet any eight from following.

Note:

- All sheets should consist of side margins and name plate.
- All sheets should be neat and tidy.

- Typical single line plan of Two BHK residential building.(with suitable scale)
- Plan and section of footings. (isolated and combined)
- Cross section of a framed structure building.
- Instruments for chain survey(Chain, peg, arrow, ranging rod etc)
- Traverse survey using Prismatic compass.
- Determination of Reduced levels (simple levelling).
- Cross section of different types of pavements.(flexible , rigid , composite)
- Section / flow chart of water treatment plant for city.
- Detail drawing for proposed rain harvesting for residential building.
- Structures used in water shade management system (any two)

BSH103: ENGINEERING CHEMISTRY and ENVIRONMENTAL SCIENCE

Semester I/II

Teaching Scheme
Lectures 4 Hrs/week

Examination Scheme
Theory 80 Marks
Class Test 20 Marks
Duration of Theory paper 3Hrs

OBJECTIVES:

- The syllabus of Engineering Chemistry and Environmental Science highlights the basic concepts of as applied to all branches of engineering.
- With the knowledge of Engineering Chemistry and Environmental Science basic principles of engineering can be understood easily.
- To acquaint students with modern techniques in Engineering Chemistry and Environmental Science which can be applied in engineering field.

COURSE CONTENT:

Unit 1: Polymer Science (8 Hrs)

Introduction, Classification, Functionality in monomer, Polymerisation: addition and condensation polymerization, Free radical mechanism of addition polymerization, effect of polymer structure on properties, Plastics: properties, compounding of plastic, types of plastics (thermosetting and thermoplastics), synthesis, properties and applications of polyethene, PVC, PVA, Teflon, PMMA, Kevlar, ABS, Bakelite, elastomers, vulcanization, need of vulcanization of rubber, Synthetic rubber: Buna-s, Buna-N, butyl rubber, polymers in medicine and surgery.

Unit 2: Abrasives and Adhesives (6 Hrs)

Definition, Natural and artificial abrasives, Cement: Introduction, classification, manufacturing and chemical composition of Portland cement,

Adhesives: Introduction, bonding processes by adhesives, Classification, Physical and chemical factors affection on adhesive action.

Unit 3: Water Technology (6 Hrs)

Sources of water, Hardness, Type and causes of hardness, units of hardness, disadvantages of hard water, Scale and slugde, Priming and foaming, caustic embrittlement, Alkalinity, Numericals on water analysis, softening methods such as Zeolite process, Ion exchange process, purification of water by electrodialysis and Reverse osmosis, Applications of pH meter and Conductometer.

Unit 4: Corrosion Science and lubricants (6 Hrs)

Definition, chemical and electrochemical corrosion and its mechanism, factors influencing on corrosion, Corrosion control, anodizing and phosphating, galvanizing and tinning, cathodic and anodic protection.

Lubricants: Introduction classification, mechanism of lubrication, Characteristics of lubricants such as viscosity, viscosity index, cloud and pour points, flash and fire point, acid value and aniline point, selection of best lubricant.

Unit 5: Chemical and Electrochemical energy sources (9 Hrs)

Introduction, classification of chemical energy (fuels), Characteristics of good fuel, Calorific values and its determination by Bomb calorimeter, Coal: classification, proximate and ultimate analysis of coal, petroleum: source, composition, refining, octane number, cetain number, Gaseous fuels, Natural gas, CNG.

Electrochemical energies; electrolysis, conductivity of electrolytes, factor affecting on conductivity of electrolytes, Batteries, types of batteries, Construction, working and application of Acid storage batteries, Lithium ion batteries, Nickel Cadmium battery, Fuel cells.

Unit 6: Chemistry in Environment (5 Hrs)

Introduction, segments of environment, Pollutions such as Air, water, soil, noise and radioactive and their preventive measures, concept of acid rain, global warming, depletion of ozone layer.

Section A: Unit 1,2,3
Section B: Unit 4,5,6

TEXT BOOKS:

1) A Textbook of Engineering Chemistry by S. S. Dara, S. Chand Publication
2) Engineering Chemistry by Jain & Jain, Dhanpat Rai And Sons

REFERENCE BOOKS:

1) A Textbook of Engineering Chemistry by M.M.Uppal
2) Applied Chemistry by Krishnamurthy. P. Vallinayagam and K. Jeysubramanian TMH Publication
3) A Textbook of Engineering Chemistry by Shashi Chawla
4) A textbook on experiment and calculations in Engineering Chemistry by S. S. Dara, S. Chand Publication
5) Engineering Chemistry by R.V.Gadag and A.N. Shetty
6) Textbook of polymers science by F.W.Billmer, John Wiley and sons.
7) University Chemistry, Mahan, Pearson education

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

BSH122: LAB II: ENGINEERING CHEMISTRY and ENVIRONMENTAL SCIENCE

Semester I/II

Teaching Scheme
Practical 2 Hrs/week

Examination Scheme
Term work 50 Marks

COURSE CONTENT

At least ten experiments out of the following experiments are to be performed.

LIST OF EXPERIMENTS:

1. Study of effect of dilution on conductivity and determination of cell constant
2. Conductometric titrations with acid-base, mixture of acids-base, precipitation.
3. Determination of hardness of water by EDTA.
4. Determination of pH values of solutions by indicators, pH papers and pH meter.
5. To study the different factors affecting rate of electro-chemical corrosion.
6. Determination of free chlorine in water in water sample.
7. Determination of dissolved oxygen in water sample.
8. Determination of viscosity of liquid by Ostwald/ Redwoods Viscometer.
9. Determination of acid value of lubricating oil.
10. Preparation of phenol formaldehyde plastic.
11. Determination of molecular weight of polymer.
12. .Preparation of Urea formaldehyde resin.
13. Determination of Aniline point of a lubricating oil
14. Determination of acid value of plastic material.
15. Determination of percentage of ash.
16. Determination of percentage of moisture.

TERM WORK

Term work shall consists of the write up on the experiments carried out during the course (at least ten) which should include aim, procedure, neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment.

Title of the subject: Computer Fundamentals-1
Code: CSE107

Teaching Scheme:
Lectures: 2 hrs/week
Practical: 2 hrs/week

Examination Scheme:
Theory Paper: 40 Marks [2 hrs]
Class Test: 10 Marks
Term work: 50

Course Objectives:

- To develop programming logic to solve basic computing problems
- To learn the syntax and usage of C programming constructs
- Provide extensive hands on for C programming

Course Outcome:
At the end of the course students will be able to:

- Solve the given problem using the syntactical structures of C language
- Develop, execute and document computerized solution for various problems using the features of C language

Prerequisites: Basic knowledge about computers hardware and software, Mathematical and logical aptitude

CONTENTS

Unit 1: Introduction to computer architecture. CPU, memory, communication between various devices of computers using bus, Secondary storage devices, What is a programming language? Types of programming language (Machine Language, Assembly Language, High Level Language), concept of compiler and interpreter

Introduction to C: Overview, Character set, C Tokens: Keywords and Identifiers, Constants and Variables, Data types, Declaration of Variables, Defining Symbolic Constants. Operators and Expressions: Arithmetic, Relational, Logical, Assignment operators, Increment and Decrement, Conditional, Special operators, Expressions, Operator precedence and associatively, Type casting. [04 Hrs]

Unit 2: Data Input-Output: Basic structure of C program, Character Input and Output, String Input and Output, Formatted Input and Output.
Control Structures: Decision making - if, if-else, nested if else, switch statement, Loop Control – while, do while and for statement, nested loops, break and continue statement, goto statement. [08 Hrs]

Unit 3: Arrays: Introduction, Array declaration and Initialization, Array types – One dimensional & Two dimensional arrays, Bubble sort, selection sort
Functions: Introduction, Standard Library Functions, User Defined Functions: Declaration & Definition, Parameter Passing - by value and by reference. Recursive functions [08 Hrs]

Text Books:

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill
2. The Complete Reference C - HERBERT SCHILDT, Tata McGraw-Hill
3. The C Programming Language – Kernighan BW, Dennis M. Ritchie, Prentice Hall

Reference Books:

1. Programming with C – Byron Gottfried – Tata McGraw-Hill
2. Let us C, Yashavant Kanetkar, BPB Publication
3. Exploring C, Yashavant Kanetkar, BPB Publication
4. Introduction to Computer Science, Pearson Education (ISBN: 9788131760307)

Digital Reference:

1. http://www.cprogramming.com/tutorial/c-tutorial.html
2. http://www.tutorialspoint.com/cprogramming/
3. http://www.programiz.com/c-programming.

PATTERN OF QUESTION PAPER

NOTE: Question No: 1 is Compulsory and solves any two questions from remaining

Question 1. **Compulsory** : Short questions/Objective questions on All Units **(10Marks)**
Question 2. **UNIT 1** : Program Writing/Theory/Handrun/Finding output**(15Marks)**
Question 3. **UNIT 2+UNIT 3** : Program Writing/Theory/Handrun/ Finding output **(15Marks)**
Question 4. **UNIT 2** : Program Writing/Theory/Handrun/ Finding output **(15Marks)**
Question 5. **UNIT 3** : Program Writing/Theory/Handrun/ Finding output **(15Marks)**

Title of the subject: Computer Fundamentals-1(Lab)
Code: CSE126

Teaching Scheme:
Practical: 2 hrs/week

Examination Scheme:
Term work: 50 marks

List of Experiments in C language:

1. Study experiment on Introduction to software, Relationship between software and hardware, Software categories: System software, Application software, Operating system, Evolutions of operating systems, Types of operating system, Functions of Operating systems. Introduction to C language.
2. Program to study arithmetic operations with input & output.
3. Program to study if and/or if else control structure.
4. Program to study while loop and do-while loop.
5. Program to study for loop.
6. Program to study one dimensional array (eg. Searching, find minimum/maximum element from array).
7. Program to perform sorting of an array elements. (Bubble sort or selection sort).
8. Program for addition of two matrices.
9. Programs to study simple functions.
10. Programs to study recursive functions.

Note: Format of Journals: Aim, Problem statement, theory, algorithm and flowchart, source code of program, handrun of program, result (Input & output).

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done as follows

- Continuous lab assessment
- Actual practical performance in Laboratory.