S-MINUTES-2

Encl. to item No. (221)
A.C. on 29/5/2007

Appendix-'A'

I-TERM

[1]	Theory 5 Subjects X 100 Marks	::	500 marks.
[2]	Practical / Term Work 3 Practical Exams of 50 Marks each and Term Work of 50 Marks.	::	200 marks.
[3]	Communication Skills	::	50 marks.
		Total:-	**750 Marks.**

II-TERM

[1]	Theory 5 Subjects X 100 Marks	::	500 marks.
[2]	Practical / Term Work 3 Practical Exams of 50 Marks each and Term Work of 50 Marks.	::	200 marks.
[3]	Mini Project [Term Work]	::	50 marks.
		Total:-	**750 Marks.**

16 Heads for passing in a year. 40% Marks required for Passing and 25% A.T.K.T.

Sd/-
P.A. Deshmukh,
(Dean & Chairman).

-=**=-

1

Appendix '15'

Encl. to item No. (221)
A.C. on 29/5/2007

Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad

Faculty of Engineering & Technology

Proposed Syllabus

for

First Year B.Tech

(four year degree sandwich course)
Common to all branches of B.Tech
(w.e.f. from June 2007)

2

Date: 27/4/2006

Subject: Proposed Syllabus Structure for First Year B.Tech.

Salient features of the proposed syllabus

1. There are 6 subjects in each semester (Five with 100 marks and Sixth with 50 marks).
2. Each semester consist of 800 marks and with 1600 marks as the annual total.
3. 70 % weight age of marks is for theory and 30% is for term work/practical.
4. The Total teaching/learning load is 34 hrs/week.
5. **Environment and Ecology is introduced** in semester – II at First year with 50 marks theory paper.
6. Basic Civil Engineering weight age is reduced from 100 marks to 50 marks at First year.
7. Engineering Drawing is being reintroduced as theory and practical.
8. Workshop practice is maintained the same status.

Distinguishing features of the proposed syllabus

1. The syllabus is framed in uniform structured format which includes: Structure, Evaluation scheme, an objective of the subject, **A:** Theory (Unit, Contents, Duration, Nature), **B:** Practicals / Drawings / Design / Workshop, **C:** Suggested textbooks and references (Title, Author, Publication and Edition) and **D: Digital references** (Website, Links, e-journals).
2. **The syllabus is framed with 60-clock hrs of theory.**
3. **Class test duration is One hour.**
4. **Tutorial is added in each semester including Mathematics.**
5. **No practical examination for First year.**
6. **Credit system is introduced.**
7. The concept of Teachers Assessment for Mathematics I and II is introduced as tutorial session for strengthening the analytical skills.
8. Physics and Chemistry are allotted in both semesters so that the student can opt for any one in a semester and will study both the subjects as independent heads.
9. Workshop practice is allotted in semester – II with Mechanical (Compulsory) and Electrical and Computers as optional.
10. Development of Skills is introduced from First year to Pre-final Year.
11. In-plant training is introduced in VIII semester (20 weeks).
12. Semester continuity will be maintained as per AICTE model curriculum.

The following references were considered for framing the syllabi:

- AICTE model curriculum
- Indian Institute of Technology
- Jawaharlal Nehru Technological University
- Institute of Engineering & Technology, Lucknow
- Nagpur University
- Shivaji University
- SGGS College of Engineering & Technology, Nanded
- Existing syllabus of Dr. BAMU.
- GATE Examination Syllabus.

Enclosures:

i. Proposed First year structure along with detailed syllabus.

Proposed Syllabus Structure for First Year B.Tech

COMMON TO ALL BRANCHES

Year - I Semester - I

Theory / Practicals / Drawings / Design / Workshop

Sr. No.	Course Code.	Subjects	Periods				Evaluation Scheme				Credits
			L	T	P	Total	TA	CT	ESE	Grand Total	
1		Mathematics - I	3	1	--	4	25	20	80	125	4
2		Engineering Physics / Engineering Chemistry	3	1	2	6	25	20	80	125	5
3		Basic Electrical Engineering	3	1	2	6	50	20	80	150	5
4		Engineering Drawing	3	1	3	7	50	20	80	150	6
5		Computer Fundamentals and Programming	3	1	3	7	50	20	80	150	6
6		Basic Civil Engineering	2	--	--	2	--	10	40	50	2
7		Development of Skills - I	--	--	2	2	50	--	--	50	1
		Total of Semester - I	17	5	12	34	250	110	440	800	29

Semester - II

1		Mathematics - II	3	1	--	4	25	20	80	125	4
2		Engineering Chemistry / Engineering Physics	3	1	2	6	25	20	80	125	5
3		Basic Electronics	3	1	2	6	25	20	80	125	5
4		Engineering Mechanics	3	1	2	6	25	20	80	125	5
5		Engineering Thermodynamics	3	1	2	6	25	20	80	125	5
6		Enviornment & Ecology	2	--	--	2	--	10	40	50	2
7		Workshop Practice	--	--	2	2	75	--	--	75	1
8		Development of Skills - II	--	--	2	2	50	--	--	50	1
		Total of Semester - I	17	5	12	34	250	110	440	800	28
		Grand Total of I & II								1600	

Periods

L : Lecture Hours per week

T : Tutorial Hours per week

P : Practical Hours per week

Class Test Duration : 1 Hour

Evaluation Scheme

TA : Teachers Assessment

CT : Class Test

TOT : Total for sessional exam of evaluation scheme

ESE : End Semester Examination

4p

Mathematics - I

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	--	25	--	--	25	1

Objective:

These contents will develop the mathematical base of the students for solving the practical problems in engineering and technology.

A : Theory

Unit	Contents	Duration	Nature
1	**Matrix:** Rank of matrix, canonical form of matrix, normal form of matrix, Solution of simultaneous linear equations (homogenous and non homogenous), linear dependence & linear independence of the vector, Characteristic equation, eigen values and eigen vectors, Caley-Hamilton theorem.	10 Hours.	Analytical
2	**Complex Number:** Introduction to complex number, De-Moiver's theorem, root of complex number, circular function and hyperbolic function, relation between circular and hyperbolic function, inverse hyperbolic functions, separation of real and imaginary parts, logarithm of complex quantity.	12 Hours.	Analytical
3	**Infinite series:** Introduction to infinite sequences and Infinite series. Test of convergence and divergence of infinite series: nth term test, integral test, p-series, geometric series, comparision test, quotient test, test for alternating series, ratio test, nth root test, Raabe's test, logarithmic test (All test without proof). Basic properties of series, power series and range of convergence.	12 Hours.	Analytical
4	**Successive Differentiation:** nth derivative of some standard functions, Leibnitz's theorem, Maclaurin's theorem, Taylor's theorem, Expansion of function in power series: method of using standard series, method of differentiation and integration of known series, method of substitution, indeterminate form.	12 Hours	Analytical
5	**Partial Differentiation:** Partial derivatives, Total differential coefficient, Euler's theorem on homogenous function, deduction from Euler's theorem, transformation of independent variables, Maxima and Minima of two independent variables, Jacobians, chain rule, Jacobian of implicit function, Application of Jacobian for finding partial derivative of implicit function.	14 Hours.	Analytical

B : Practicals / Drawings / Design / Workshop

Not Applicable

5

C. Suggetsed Text Books and References

Sr. No.	Tittle	Author	Publication	Edition
1	A Text Book Of Applied Mathematics-Vol-I and Vol-II	P.N.Wartikar and J.N.Wartikar,	Pune Vidyarthi Griha Prakashan	7th / 9th
2	Higher Engineering Mathematics	B.S.Grewal,.	Khanna Publishers	37th
3	Advanced Engineering Mathematics.	H.K.Dass	S Chand & Co. Ltd.	12th
4	Advanced Engineering Mathematics	E.Kreysing	John Wiley	5th / 8th
5	Calculus and Analytic Geometry	Thomas G. B. and Finney R. L.	Addison - Welsey / Narsoa	6th
6	Differential and Integral Calculus - Vol-I and Vol-II	Piskunov	Mir Piblishers, Moscow	

D. Digital references

Sr. No.	Website / Links / e-journals
1	www.sosmath.com
2	www.mathmadeeasy.com
3	www.hotmath.com
4	www.mathworldwolfram.com
5	Bulletin of Marathwada Mathematical Society
6	www.springer.com/application of mathematics
7	www.springer.com/applied mathematics and optimization

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Engineering Physics

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	25	--	--	25	1

Objective:

Introduction of Physics in the curricullum intends to study physical properties of material and basic facts, concepts, laws, principles of scientific investigation of physical quantities required in engineering and technology.

A : Theory

Unit	Contents	Duration	Nature
1	**OPTICS INTERFERENCE:** Interference in thin film, Newton's ring in reflected light, application- wavelength determination, refractive index, optical flatness, optical filters, antireflection coatings, and young's modulus. DIFFRACTION: Diffraction of light, Fresnel and fraunhoffer diffraction (only definition) diffraction at circular aperture, grating, grating theory, Rayleigh's criterion for resolution, resolving power of telescope. POLARISATION: polarization, types of polarization (plane, circular, elliptical), Brewster's law, double refraction, Nicol prism, Analysis of polarized light, Optical rotation, specific rotation, polarimeter, Faraday effect, Kerr effect, photo elasticity.	8 Hours.	Descriptive & Analytical
2	**LASER :** Properties of laser, interaction of radiation with matter, spontaneous emission, stimulated emission, population inversion, active medium, lasing mechanism, Ruby laser, He-Ne laser, semiconductor laser, applications.	3 Hours.	Descriptive & Analytical
3	**OPTICAL FIBRE** Construction of Propogation of light through optical fiber, acceptance angle, numerical aperture, types of optical fiber- multimode, graded index optical fiber, Optical communication, applications.	3 Hours.	Descriptive & Analytical
4	**SUPERCONDUCTIVITY** Phenomenon, zero electrical resistance, effect of temperature and magnetic field, Mesissner effect, Silsbee rule, Isotope effect, type I and type II superconductor, Josephson junction, SQUIDS, applications.	4 Hours	Descriptive & Analytical
5	**NUCLEAR PHYSICS** Nuclear reactions, Q-value, Nuclear fission and fusion, chain reaction, controlled and uncontrolled nuclear reactions, multiplication factor, Nuclear reactor, fusion reaction as a source of stellar energy, Accelerators- cyclotron, betatron, Nuclear Detectors – G.M. counter.	6 Hours.	Descriptive & Analytical
6	**ULTRASONIC** Limits of audibility, properties of ultrasonic waves, piezoelectric and magnetostriction effect. Piezoelectric transducer, magnetostriction transducer, Application of ultrasonic.	2 Hours.	Descriptive & Analytical

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7	ACOUSTICS Elementary acoustics, echo, reverberation, reverberation time, absorption coefficient, Sabine's formula (Derivation not necessary) Acoustical design of a hall, Common acoustical defects, Acoustical materials.	2 Hours.	Descriptive & Analytical
8	X-RAYS AND CRYSTAL STRUCTURE Crystalline and amorphous materials, periodicity in crystal, crystal structure, geometry of space lattice, unit cell, crystal symmetry, crystal structure and plane, Miller indices, X-rays, continuous and characteristic Spectra. Bragg's law, Bragg's spectrometer, powder method, structure	7 Hours.	Descriptive & Analytical
9	CRYSTAL IMPERFECTIONS Imperfections in crystal (crystal defects), point defects, line defects (dislocations), plane defects (grain boundaries), Point defects- Vacancies, interstitial, impurity defects, dislocation- edge dislocation, screw dislocation, properties of dislocation,	3 Hours.	Descriptive & Analytical
10	CONDUCTORS, SEMICONDUCTORS Origin of energy bands in solids, valence band, conduction band, forbidden gap, classification of solids on the basis of band theory of solids, semiconductors, diode and zener diode and their characteristics, transistor and its action, CE amplifier, Hall effect, Hall coefficient.	3 Hours.	Descriptive & Analytical
11	MAGNETIC MATERIALS Magnetic and non magnetic materials, terminology and classification of magnetic materials, Ferromagnetism and domain theory, Ferrites, applications. Soft and hard magnetic materials, magnetic materials for electric devices.	4 Hours.	Descriptive & Analytical
12	DIELECTRICS Introduction, dielectric parameters-dielectric strength, dielectric constant, dipole moment, polarization etc. Types of Polarization- electronic, ionic, and orientation polarization. Effect of temperature and frequency on polarization, dielectric breakdown, effect of moisture on insulation system, protection of insulation against moisture.	4 Hours.	Descriptive & Analytical
13	ELECTRON OPTICS Motion of charged particle in electric and magnetic field (in parallel, perpendicular, oblique to motion), electron refraction- Bethe's law, electrostatic focusing, electron gun, cathode ray tube (CRT)- construction, working, electron microscope-construction, working and applications, Positive rays- production and properties, determination of q/m by Thomson's method, Bainbrige mass spectrograph- construction, working.	5 Hours.	Descriptive & Analytical
14	MODERN PHYSICS Wave-particle duality, de-broglie concept of matter wave, matter wave and their properties, Davission-Germer experiment, Heisenberg uncertainty principle, Schrodinger time independent equation and its application to a particle in a box.	3 Hours.	Descriptive & Analytical
15	FIELD THEORY Field, scalar and vector field, flux of a field, gradient of a field Divergence and Curl of a field, conservative and non-rotational field. Stoke's theorem, Divergence theorem, Gauss's theorem (Statement of theorem only), Application of Gauss's law in determining electric field.	3 Hours.	Descriptive & Analytical

B : Practicals / Drawings / Design / Workshop

Term work shall consist of laboratory work based on the list of experiments given below. (Any 10 experiments)

Sr.No.	Particulars
1	Newton's ring: To determine radius of curvature of convex lens
2	Refractive index of a liquid by Newton's ring: To determine refractive index of a liquid
3	Optical flatness: To test the optical flatness
4	Grating: To determine wavelength of light
5	Polarimeter: To determine concentration of solution
6	Laser: Study experiment on different lasers
7	Ultrasonic interferometer: To determine the velocity of ultrasonic waves.
8	Reverberation time: To determine reverberation time of a hall
9	Crystal structure from diffraction pattern: To determine crystal structure from diffraction pattern
10	e/m by Thomson method: To determine e/m
11	Elements of symmetry: To study different elements of symmetry
12	Diode characteristics: To study characteristics of diode
13	Zener diode: To study characteristics of zener diode and to determine zener voltage
14	Dielectric constant: To determine dielectric constant
15	Forbidden gap: To determine forbidden gap of semiconductors
16	B-H curve: To determine hysteresis loss.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

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C. Suggetsed Text Books and References

Sr. No	Tiltle	Author	Publication	Edition
1	A Textbook of Engineering Physics	Avdhanulu, Kshirsagar	S Chand & Co.	7th
2	A Textbook of Engineering Physics	Gaur and gupta	Dhanpatrai & Sons	3rd
3	Material Science	V.Raghavan	Prientice Hall of India	3rd
4	Electrical Engineering Material	A. J. Dekkar	Prientice Hall of India	4th
5	Engineering Physics	S.K.Shrivastava & R.A.Yadav	New Age International	3rd
6	Electrical Engineering Materials	S. P. Sheth and Gupta	Dhanpatrai & Sons	4th
7	Solid State Physics	A.J.Dekkar	Prientice Hall of India	5th
8	Engineering Physics	P.V.Naik	Pearson	1st
9	Applied Physics	V.R.Doiphode	Pune Vidyarthi Grauh	3rd
10	Optics	Subrmaniam, brijlal	S Chand & Co.	23rd
11	A Textbook of Engineering Physics	B.L.Thereja	S Chand & Co.	3rd
12	Modern Physics	B.L.Thereja	S Chand & Co.	11th

D. Digital references

Sr. No	Website / Links / e-journals
1	www.hull.ac.uk/engineering/teaching/modules
2	www.cyto.purdue.edu
3	www.matter.org.uk/diffraction
4	www.physics.gatech.edu
5	

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Engineering Chemistry

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	25	--	--	25	1

Objective:

Introduction of Chemistry in the curriculum intends to study different phenomena and properties of components required in the field of engineering and technology.

A : Theory

Unit	Contents	Duration	Nature
1	**Water:** Water Quality Parameters- Definition and Expression, Analysis of water – alkalinity(Titrimetry method only), hardness (EDTA method only). Water for domestic use, Water softening processes – Lime – Soda process, Ion exchange method, Water for industry, boiler feed water, boiler problems-scale, sludge, priming and foaming, caustic embrittlement , their causes and prevention. Numerical on alkalinity, hardness.	8 Hours.	Descriptive and Numerical
2	**Fuels:** Classification, calorific value: gross and net calorific values.Numerical on Calorific Value. Solid Fuels: Proximate and ultimate analysis of coal and their importance, Carbonisation of Coal,Coke. Liquid Fuels: Petroleum: its chemical composition and fractional distillation, cracking of heavy oil residues – thermal and catalytic cracking, knocking, octane number and cetane number and their significance, power alcohol.Gaseous Fuels: Natural gas, LPG, producer gas, biogas.	10 Hours.	Descriptive and Numerical
3	**Lubricant:** Definition, Friction, Lubrication mechanism, Classification, Properties of Lubricants, Viscosity, Viscosity Index, Fire Point, Cloud Point, Pour Point, Aniline no, Neutralization no, Emulsification no, Selection of Lubricants.	5 Hours	Descriptive
4	**Environmental Degradation:Corrosion:** Types of corrosion (dry, wet, atmospheric and soil corrosion), mechanism of corrosion, prevention of corrosion.**Oxidation:** Kinds of Oxides formed on metal surfaces, protective coatings- galvanizing, tinning, metal cladding.	7 Hours.	Descriptive
5	**Ceramics:** Classification,General Properties(Mechanical, Thermal,Electrical), Classification, characteristics and applications of Rocks & Stones, Refractories,Glasses(Borosilicate,Coloured Glasses, Fibre glasses),Cement, Reinforced concrete.	8 Hours.	Descriptive
6	**Polymers:** Definition, Classification, Types of Molecular Weight, Thermoplastics and Thermosetting Plastics. Monomers,Structure, Properties and Application of PE,PP, PVC, Polyesters, Nylon 6, Nylon 66, ABS and Natural Rubber. Applications of Plastics in Automobile, Electronics Industry, Agriculture and Biomedical field.	7 Hours.	Descriptive

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7	**Recycling:** 1. Recycling of waste water,Waste water treatment—(a) Domestic - Aerobic & anaerobic Treatment (b) Industrial—Electro dialysis, 2.Recycling of PlasticsWaste -Recycling methods,application fo plastics waste, Fuel From Plastics Waste, Recycling of PVC,PET, PE	7 hours	Descriptive
8	**Thermo chemistry:** Definition, Heat of reaction, enthalpy, entropy, physical significance of entropy, 1st and 2nd law of thermodynamics, Carnot's theorem, Gibbs-Helmholtz free energy and work function, simple problems.	8 Hours.	Descriptive and Numerical

B : Practicals / Drawings / Design / Workshop

Term Work:

Sr.No.	Particulars
1	Determination of hardness (total, temporary & permanent) of water- EDTA method.
2	Estimation of different types and amounts of alkalinity in water - Indicator method
3	Determination of percentage of moisture and ash in coal sample.
4	Determination of Acid Value of oil.
5	Measurement of Corrosion rate.
6	Measurement of enthalpy of combustion by Bomb Calorimeter.
7	Determination of molecular weight of Polymer- Viscometric Method
8	Labelled diagram of entropy changes in a reversible cyclic process
9	Determination of emulsification number of oil
10	Determination of capacity of Anion/Cation Exchange Resin.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No	Tiltle	Author	Publication	Edition
1	Engineering Chemistry	Jain and Jain	Dhanpat Rai Publishing Company	
2	Fundametals of Engineering Chemistry (Theory and Practice)	S.K.Singh	New Age International Publishers	
3	Chemistry in Engineering & Technology (Vol I & II)	J.C. Kuriacose & J. Rajaram		
4	Materials Science & Processes	S.K. Hajra Choudhury	Indian Book Distrubution Co	
5	Engineering Materials	Venneth G. Budinski	Prentice Hall of India	
6	Polymer Science	V.R. Gowarikar	Wiley Eastern Ltd	
7	Polymer Science and Technology	Joel R. Fried	Prentice Hall of India	
8	Plastics Technology Handbook	Manas Chand & Salil K		3rd
9	Handbook of Plastic Technology - Vol-II	W S Allen & P N Baker		

12

D. Digital references

Sr. No	Website / Links / e-journals
1	
2	
3	
4	
5	

13

Basic Electrical Engineering

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	50	--	--	50	1

Objective:

Presently, Electronics Engineering has become most important, and Electrical Engineering is the mother of electronics branch.
The contents are prepared which will be help to study the basics of electrical engineering required for all the branches of engineering & technology.

A : Theory

Unit	Contents	Duration	Nature
1	**DC Circuit Analysis:** Circuit Analysis by (i) Loop or mesh current method (ii) Nodal analysis (iii) Star-delta transformation (iv) Superposition Theorem (v) Thevenin's Theorem (vi) Norton's Theorem, (vii) Maximum power transfer theorem	12 Hours.	Descriptive & Analytical
2	**Resistance:** Effect of temperature on resistance of metals, Alloys, Insulators; temperature coefficient of resistance, insulation resistance of cable, Electrolytes.	3 Hours.	Descriptive
3	**Capacitance:** Charging and Discharging of a capacitor through resistance from constant DC source and time constant	4 Hours.	Descriptive & Analytical
4	**Magnetic Circuit:** MMF, reluctance, magnetic field strength, permeability, permeance, analogy between electrical and magnetic circuit. Series and parallel magnetic circuit, magnetization curve, self and mutual inductance, coefficient of coupling, rise and decay of current in an inductive circuit, time constant.	12 Hours.	Descriptive & Analytical
5	**AC Circuit:** Production of sinusoidal voltage, RMS, peak and average value of AC quantity, form factor, peak factor. Reactance, impedance, apparent power, active power, reactive power, power factor, series and parallel circuit, solution of circuits by impedance/admittance, j- notation method, Phasor diagram using R, L, & C. Resonance in series and parallel circuit	13 Hours.	Descriptive & Analytical
6	**Single Phase Transformer:** Principle of working, construction and types of transformer - core type and shell type, EMF equation, ideal and practical transformer on no – load, on load, regulation and efficiency of transformer by direct loading.	5 Hours.	Descriptive & Analytical
7	**Measuring Instrument:** Deflecting torque, controlling torque, damping torque; moving coil instrument – PMMC and Dynamometer type, use as ammeters and voltmeters, Dynamometer type wattmeter, use of analog and digital multimeter.	5 Hours.	Descriptive

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6	**Miscellaneous:** Wiring accessories, Types of wiring system, Fluorescent tube wiring, Necessity of earthing, Use of Megger for insulation resistance test. Use of Analog and Digital Multimeter	6 Hours.	Descriptive

B : Practicals / Drawings / Design / Workshop

Term Work: Minimum eight experiment from the following list should be conducted during course and record

Sr.No.	Particulars
1	House wiring (Control of two lamp by two switches)
2	Stair-case wiring
3	Verification of superposition theorem
4	Verification of Thevnin's Theorem.
5	R.L.C. series circuit.
6	Voltage ratio and current ratio of single-phase transformer.
7	Efficiency and regulation of single-phase transformer by direct loading.
8	Study and connection of Fluorescent Tube.
9	Measurement of power in single-phase circuit.
10	Measurement of Insulation resistance by Megger.
11	Use of Multimeter.
12	Charging and discharging curves of a capacitor.
13	Study of Dynamometer type wattmeter.
14	Study of PMMC instrument.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Electrical Technology - volume - I & II	B.L. Theraja	S Chand & Co.	23rd
2	Electrical Technology	Edward Hughes	ELBS	6th
3	Basic Electrical Engineering	J.B. Gupta.	S K Kataria & Sons	11th
4	Basic Electrical Engineering	V.N. Thatte	Vrinda Publication	
5	Basic Electrical Engineering	V N Mittle	Tata Mcgraw Hill	13th

D. Digital references

Sr. No.	Website / Links / e-journals
1	www.springer.com/electricalengg

15

Engineering Drawing

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	3	50	--	--	50	2

Objective:

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

A : Theory

Unit	Contents	Duration	Nature
1	PROJECTIONS OF STRAIGHT LINE: - line inclined to one plane, line inclined to both the planes, traces of a line, practical application on projections of straight line. Lines in different quadrants may be considered.	8 Hours.	Graphical
2	PROJECTIONS OF PLANE: - planes with surface inclined to one plane, planes with surface inclined to both planes. Planes of regular and irregular shapes (e.g.-triangles, square, rectangle, quadrilaterals, pentagon, hexagon, circle, semicircle, etc. shall be considered.	6 Hours.	Graphical
3	PROJECTIONS OF SOLIDS: - projections of solids with single inclination, projections of solids with double inclination, projections of composite solids with single inclination. Solids like prisms, cylinder, pyramid, cone, sphere, frustums, cube, tetrahedron, arrangement of two or more solids etc. shall be considered.	8 Hours.	Graphical
4	SECTION OF SOLIDS:-projections of geometrical solids cut by cutting planes inclined to one plane, projections of composite solids cut by cutting planes inclined to one plane, determination of cutting plane angle from the given true shape of section.	8 Hours	Graphical
5	DEVELOPMENT OF SURFACES: - methods of development of surfaces of various geometric solids, development of surfaces of cut solids, determination of shortest distance between the two given points on the solids.	8 Hours.	Graphical
6	ORTHOGRAPHIC PROJECTION:- obtaining orthographic projections of different machine parts from the given 3D view, sectional orthographic projections, adding missing views in given two orthographic views.	10 Hours.	Graphical
7	ISOMETRIC VIEWS:- introduction to isometric projections, isometric and non isometric lines, isometric and non isometric planes, isometric projections and isometric views	8 Hours.	Graphical
8	COMPUTER AIDED DRAFTING:- 2-D & 3-D modeling, 2-D & 3-D transformations.	4 Hours.	Graphical

16

B : Practicals / Drawings / Design / Workshop

Term work shall consist of half imperial size drawing sheets containing assignment problems (at least four) on each chapter. Print outs of 2-D and 3-D models using any drafting software.

The assessment of term work shall be done on the following: • Continuous assessment • Performing the experiments in the laboratory • Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Elementary Engineering Drawing	N.D.Bhatt	Charothar Publishers	
2	A Text Book of Engineering Graphics	M.L.Dabhade		
3	Engineering Drawing	Mali & Chaudhary	Vrinda Publishers	
4	Engineering Drawing	N.H.Dubey		

D. Digital references

Sr. No.	Website / Links / e-journals
1	Google Search (Advanced) for "Engineering Drawing" , "Engineering Graphics"

17

Computer Fundamentals and programming

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	3	50	--	--	50	2

Objective:

To be conversant with basics of computer.
To understand the concepts of programming languages & process.
To understand how computers affects the users.
To develope programming skills in C language.

A : Theory

Unit	Contents	Duration	Nature
1	**Introduction To Computers** What is a computer, Evolution of computers, Types of computers, Applications of computers.	2 Hours.	Theoritical
2	**Overview of Computer System** Parts of computers, computer hardware, units of measure for computer memory & storage, Input and Output devices, Types of storage devices, computer Software and Types.	4 Hours.	Theoritical
3	**Operating System Basics** What is an Operating System, Role of an Operating System, Functions of Operating System. Types of Operating System	3 Hours.	Theoritical
4	**Programming Languages and Programming process** Main categories of Programming Languages, Five Generations of Programming languages, Major programming languages. How a visual programming environment is used, Five phases of system development life cycle.	5 Hours	Theoritical
5	**Computers and Individual** Health risks related to computer use, making computer workspace ergonomically correct., how spamming, spoofing affects computer users., normal activities that result in a threat to personal activity.	4 Hours.	Theoritical
6	**Introduction to C** The C character set, constants, variables , keywords and operators. Instructions, Type conversion , The C program structure, Simple C program.	5 Hours.	Theoritical
7	**The Decision control and loop Control structure.** The if –statement, the if-else statement, Loops- While, for and do-while loops, Break statement, Case control structure, Switch and goto statement.	8 Hours.	Theoritical
8	**Functions and Pointers.** What is a function-why to use functions, Passing values between functions-Scope Rule of functions, Advanced features of functions-function declaration and Prototypes, Call by Value and Call by Reference, Introduction to Pointers, Pointer notation, and Recursion.	8 Hours.	Theoritical

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9	Arrays . Array initialization, Bound checking, Passing Array Elements to a functions, Pointers and Arrays-Passing an entire Array to a Function, One Dimentional Array- Initializinga two Dimensional Array, Memory map of a Two Dimensional Array, Pointers and Three Dimensional Arrays.	7 Hours.	Theoritical
10	**Strings** What are Strings, Standard Library Functions-strlen(),strcpy(),strcat(),Strcmp(),Array of characters.	4 Hours.	Theoritical
11	**Structures** Why use Structures-Declaring a Structure ,Accessing Structure elements, How Structure elements are stored, Array of Structures, Additional features of Structures, Uses of Structures.	5 Hours.	Theoritical
12	**Input/Output in C** Types of I/O, console I/O functions sprintf() and sscanf() functions,Disk I/O functions-File opening modes, A file copy program, a closer look at fclose(),Using argc and argv, String in Files, Formatted Disk I/O functions, Text mode vs Binary mode, Record I/O in files.	5 Hours.	Theoritical

B : Practicals / Drawings / Design / Workshop

Term Work: Term work shall consist of record of on laboratory experiments on the following

Sr.No.	Particulars
1	If marks obtained by student in seven different subjects are input through keyboard, find out the total marks and percentage of marks obtained by the student. Assume max marks of each subject as 100
2	Any year is input through the keyboard, write a program to find out whether it is a leap year or not.
3	If a five digit number is input through the keyboard write a program to calculate the sum of its digits.
4	Write a program to find out the factorial of a number using function.
5	Write a program to display Fibonacci sequence with the help of recursion.
6	Write a program to add nxn matrix.
7	Write a program to multiply nxn matrix.
8	Write a program to display all rotations of a string using pointers. Ex:-the rotations of string "space" are space,paces,acesp,cespa,espac.
9	Write down two functions xgets() and xputs() which will work same as standard library functions gets() and puts().
10	Write a program to count number of words in a given text file.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

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C. Suggested Text Books and References

Sr.No.	Tiltle	Author	Publication	Edition
1	Introduction to computers	Peter Norton	Tata McGrawHill	4th
2	Let us C	Yashawant Kanetkar	BPB Publication	3rd
3	The C Programming Language	Brian W.Kernighan Dennis M.Ritchie	PrenticeHall	2nd
4	Operating System concepts	Galvin	Addison Wesley publication	5th

D. Digital references

Sr.No.	Website / Links / e-journals
1	www.glencoe.com/norton/norton4e/introduction
2	www.grassrootdesign.com/intro/index.php
3	www.springer.com/engineeringwithcomputers

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Basic Civil Engineering

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
2	--	--	--	10	40	50	2
--	--	--	--	--	--	--	--

Objective:

To impart general idea about construction materials and building elemnets.

A : Theory

Unit	Contents	Duration	Nature
1	Civil Engineering Materials: study of properties and use of different civil engineering materials namely bricks, rubble, cement, sand, coarse aggregate.	3 Hours.	Theoretical
2	Introduction to foundation and types: isolated footing, combined footings, cantilever footing.	4 Hours.	Theoretical
3	Introduction to brick masonry and bonds in brick, header bond, stretcher bond, English and Flemish bond.	3 Hours.	Theoretical
4	Lintels & Doors and windows - types of lintels, definition of technical terms of doors and windows, study of battened, ledged and braced door, casement windows, glazed windows, metal windows.	4 Hours.	Theoretical
5	Stairs- definition of technical terms, requirements of good stair, classification of stairs, thumb rule for rise and tread relation.	4 Hours.	Theoretical
6	Roofs and floors: Trussed roofs- king post roof truss and queen post roof truss, flat R C C roof. Components of a floor, materials for construction of floor.	4 Hours.	Theoretical
7	General study of building: plinth area, carpet area, FSI. Cost of building based on plinth area rate.	2 Hours.	Theoretical and analytical
8	Elementary surveying: a) Length measurement- use of metallic tape and chain (20m and 30m). b) Angular measurement- use of prismatic compass, simple problems c) Level measurement-use of dumpy level, simple problems on calculation of reduced levels.	6 Hours.	Theoretical and analytical

B : Practicals / Drawings / Design / Workshop

Not Applicable

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C. Suggetsed Text Books and References

Sr.No	Tiltle	Author	Publication	Edition
1	Building construction	B C Punmia	Laxmi Pub.Pvt.Ltd.	
2	Building construction	Sushil Kumar	Std. Pub. & Distributors	
3	Surveying and leveling	Kanetkar and Kulkarni	Pune Vidhyarthi Graha Prakashan.	

D. Digital references

Sr. No.	Website / Links / e-journals
1	www.pubs.asce.org/journal/jms.html
2	Journal of Construction Engineering & Management
3	Journal of Materials in Civil Engineering
4	Journal of Surveying Engineering

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Development of Skills - I

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
--	--	--	--	--	--	--	--
--	--	2	50	--	--	50	1

Objective:

To help students sharpen their awareness of the English language and use it effectively in their personal, academic and professional communication

A : Theory

Not Applicable

B : Practicals / Drawings / Design / Workshop

Six assignments based on the topics mentioned			
Section	**Contents**	**Duration**	**Nature**
Skills	Definition, Developmnet and Importance	**2 Hours**	
Communication Skills - I	Introduction (Nature and Structure)	**4 Hours**	
Oral Communication	Introduction	**2 Hours**	
Oral Communication	A. Problems in English Pronounciation	**6 Hours**	
Oral Communication	B. Listening Comprehension	**2 Hours**	
Oral Communication	C. Speaking Skills:	--	
	1. Conversation Skills	**2 Hours**	
	2. Public Speaking and Presentation Skills	**2 Hours**	
	3. Debating Skills	**2 Hours**	
	4. Group Discussion Skills	**4 Hours**	
	5. Interview Skills	**4 Hours**	

The assessment of term work shall be done on the following:

- Continuous assessment
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

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C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Oxford Advanced Learner's Dictionary of Current English	A S Hornby	OUP	7th
2	Technical Writing and Professional Communication for Non-Native Speakers of English	T N Huckin and L A Olse	Mc Graw Hill	2nd
3	Developing Communication Skills	Krishna Mohan and Meena Bannergi	MacMillan India Limited	
4	Speaking English Effectively	Krishna Mohan and N P Singh	MacMillan India Limited	3rd
5	Business Correspondance and Report Writing	R C Sharma and Krishna Mohan	Tata Mc Graw Hill	4th
6	Communication Skills for Technical Students	T M Farhatullah	Orient Longman	
7	English Skills for Technical Students	WBSCTE, NBSCTE	Orient Longman	
8	Technical Writing: Process and Product	Sharon J Gerson and Steven Gerson	Prientice Hall	3rd
9	Excellence in Business Communication	John Thill & Bovee	Mc Graw Hill	2nd

D. Digital references

Sr. No.	Website / Links / e-journals
1	
2	
3	
4	
5	

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Mathematics - II

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	--	25	--	--	25	--

Objective:

The contents aims to develop the knowledge of the students in the direction of solving the practical problems in engineering and technology related to integral calculus, differential equations, curve tracing, tangents and normal along with the curvature.

A : Theory

Unit	Contents	Duration	Nature
1	**Integral calculus:** Reduction formulae, Beta function, Gamma function, Relation between Beta and Gamma function, Differentiation under integral sign (D.U.I.S).	7Hours.	Analytical
2	**Curve Tracing:** Tracing of Cartesian Curve (Explicit functions), polar Curve and parametric Curve. Rectification of Cartesian Curve, polar Curve and parametric Curve	9 Hours.	Analytical
3	**Multiple integrals:** Double integration in Cartesian and polar co-ordinates, Change of order of integration, change to polar co-ordinates, triple integral. Application to areas, volumes, surface areas, and volume of revolution.	14 Hours.	Analytical
4	**Differential equations:** Solution of differential equation of first order and first degree: exact, linear and reducible to linear form. Application of differential equation of first order and first degree to mechanics, electrical circuit, orthogonal trajectories and Newton's low of cooling.	14 Hours	Analytical
5	**Tangents and Normals:** Equation of tangent and normal (Cartesian and parametric curve), Angle between radius vector and tangent, pedal equation for Cartesian and polar equation.	8 Hours.	Analytical
6	**Curvature:** Radius of curvature for cartesian curve (Explicit functions), Radius of curvature at origin, Radius of curvature for polar curve using pedal equation, chord of curvature through the pole, coordinates of centere of curvature.	8 Hours.	Analytical

B : Practicals / Drawings / Design / Workshop

Not Applicable

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C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	A Text Book Of Applied Mathematics- Vol-I and Vol-II	P.N.Wartikar and J.N.Wartikar,	Pune Vidyarthi Griha Prakashan	7th / 9th
2	Higher Engineering Mathematics	B.S.Grewal,.	Khanna Publishers	37th
3	Advanced Engineering Mathematics.	H.K.Dass	S Chand & Co. Ltd.	12th
4	Advanced Engineering Mathematics	E.Kreysing	John Wiley	5th / 8th
5	Calculus and Analytic Geometry	Thomas G. B. and Finney R. L.	Addison - Welsey / Narsoa	6th
6	Differential and Integral Calculus - Vol-I and Vol-II	Piskunov	Mir Piblishers, Moscow	

D. Digital references

Sr. No.	Website / Links / e-journals
1	www.sosmath.com
2	www.mathmadeeasy.com
3	www.hotmath.com
4	www.mathworldwolfram.com
5	Bulletin of Marathwada Mathematical Society
6	www.springer.com/application of mathematics
7	www.springer.com/applied mathematics and optimization

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Basic Electronics

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	25	--	--	25	1

Objective:

The subject intends to study basics of electronics & instrumentation technology in view with semiconductors, digital circuits, transducers and automation phenomena

A : Theory

Unit	Contents	Duration	Nature
1	**Semiconductor devices:** Semiconductors, types of semiconductors, constructional features and characteristics of P-N junction diode, zener diode, special diodes, NPN, PNP transistor, UJT, JFETs, MOSFET,LED and LCD seven segment display.	6 Hours.	Descriptive
2	**Power Conversion:** Rectifiers, types of rectifiers, comparison of rectifiers, principle of regulated power supply.	4 Hours.	Analytical
3	**Wave Shaping:** Differentiating and integrating circuits, clipping, clamping, applications of wave shaping circuits.	4 Hours.	Analytical
4	**Amplifiers:** Ideal amplifier and its characteristics, BJT and their ratings, performance measure of amplifiers like gain, frequency response, Distortion and stability, CE,CB, and CC configurations, their comparisons and uses. Biasing and stabilization BJT, FET, amplifiers, Class-A, Class-B, Class-AB, Class-C, operation.	7 Hours	Descriptive
5	**Operational Amplifiers:** Differential amplifier, inverting and non - inverting configuration of op-amp, op-amp parameters, and elementary applications like summing, scaling, averaging amplifiers, unity gain buffer amplifier as a comparator.	6 Hours.	Descriptive
6	**Digital Circuits:** Basic logic gates, Universal logic gates, Boolean algebra, simple logic circuits using universal logic gates. Introduction to logic families. Introduction to combinational, arithmetic and sequential logic circuits with MSI chips.	7 Hours	Analytical
7	**Introduction to Measurement system:** Generalized measurement system, static and dynamic characteristics, errors and their types. Digital multimeter, Recorders, X-Y plotter, Strip chart recorder, Magnetic tape recorder. Introduction to signal conditioning.	7 Hours.	Descriptive
8	**Transducers:** Definition, Types, Classification of transducers. Temperature measurement- RTD, Thermocouple, Thermister. Flow measurement: Differential flow meters like orifice, venturi meter. Level measurement: Capacitive type and Float type level measurement. Pressure measurement- Diaphragm, Bellows, Bourdon tube. Strain gauge. Displacement measurement: Inductive type (LVDT).	9 Hours.	Descriptive

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9	**Cathode Ray Oscilloscope:** Functional block diagram of CRO, front panel controls and working of CRT, applications like voltage, frequency, and phase measurement using CRO.	6 Hours.	Descriptive
10	**Recent trends in Instrumentation:** Introduction to automation. Introduction to pneumatic and hydraulic systems. Introduction to control elements	4 Hours.	Descriptive & Introductory

B : Practicals / Drawings / Design / Workshop

Term Work: Minimum 10 Experiments from the following list

Sr.No.	Particulars
1	Semiconductor diode characteristics (V I Characteristics)
2	characteristics of PNP/NPN transistor.
3	Charecteristics of UJT (V I Characteristics)
4	Charecteristics of FET (V I Characteristics)
5	Regulation Charecteristics of half wave rectifier using filters
6	Regulation Charecteristics of full wave and bridge rectifier using filters
7	Differentiating and integrating circuits using Op-amp
8	Study of logic gates (AND, OR, NOT, NAND, EX-OR)
9	Study of strain gauge.
10	Study of pressure gauge (Bourdon Tube)
11	Measurement of displacement using LVDT
12	Study of CRO on trainer kit
13	Measurement of voltage, phase and frequency using CRO.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Integrated Electronics.	Millman , Halkias	Tata Mc Graw Hill	International Student Edition
2	Linear Integrated Circuits and operational amplifiers	Ramakant Gaikwad	Prientice Hall of India	4th
3	Applied Electronics	R.S. Sedha	S Chand & Co. Ltd.	1st
4	Electronic Instrumentation	S. K. Khedkar.	PVG Prakashan	1st
5	Process Control Instrumentation technology	C. D. Jhonson	Prientice Hall of India	7th
6	Electronics and Electrical Measurement and Instrumentation	A.K.Sawhney	Dhanpat Rai & Sons	11th
7	Fundamentals of Digital Circuits	A.Kumar	Prientice Hall of India	2nd

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D. Digital references

Sr. No.	Website / Links / e-journals
1	www.springer.com
2	http://books.google.co.in/books?ie=UTF-8&q=e-books+on++semiconductors
3	http://books.google.co.in/books?ie=UTF-8&q=e-books+on++transducer&btn
4	http://books.google.co.in/books?ie=UTF-8&q=e-books+on+logic+gates
5	http://www.techsourcer.com/engineering/amplifiers.html
6	http://books.google.co.in/books?ie=UTF-8&q=e-books+on+Automation&btnG

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Engineering Mechanics

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	25	--	--	25	1

Objective:

To study fundamentals and to impart knowledge about role of statics & dynamics in engineering and technology.

A : Theory

Unit	Contents	Duration	Nature
1	**Force System:** Basic Definitions, Force, Rigid Body, Particle, Moment of a Force, Principle of Transmissibility, Principle of Superposition, Varignon's Theorem, Lami's Theorem, Law of Parallelogram of Force, Resolution & Composition of Force. Force systems (co-planer 2-D Systems only), Analytical method of resultant, equivalent force couple, Free body Diagrams, Concept of Equilibrium, Equilibrium of 2-D Force systems, Analysis of pin jointed plane frames, types of supports, types of loading, Beam reactions.	9 Hours.	SAQs and Numerical
2	**Plane Trusses:** Analysis of Pin Jointed determinate Plane Trusses, Method of Joints, Method of Sections, Graphical Method.	6 Hours.	SAQs and Numerical
3	**Virtual Work:** Principle of Virtual work. Application to beams and bodies in equilibrium.	3 Hours.	SAQs and Numerical
4	**Friction:** Basic definitions, Laws of Friction, Angle of Friction, Cone of Friction, Angle of repose, Limiting equilibrium for bodies under force systems, Belt friction.	6 Hours	SAQs and Numerical
5	**Center of Gravity & Moment of Inertia:** Derivation of CG and MI of standard shape of Lines, Plane Lamina, Radius of Gyration, Parallel and Perpendicular Axis Theorem.	6 Hours	SAQs and Numerical
6	**Kinematics of Particles:** Linear motion, Motion with constant Acceleration, Motion with variable Acceleration, Motion Diagrams, Curvilinear motion, Relation between Linear & Curvilinear motion, Tangent & Normal Acceleration, Projectile Motion, Relative velocity and Resultant Velocity.	9 Hours.	SAQs and Numerical
7	**Kinetics of Rigid Bodies:** Plane motion of Particles and connected bodies, Linear Motion, Translation, Combined Linear & Translation Motion, ICR.	6 Hours.	SAQs and Numerical
8	**Kinetics of Particles:** Linear motion of Particles and Connected Bodies.	6 Hours.	SAQs and Numerical
9	**Kinetics of Rigid Bodies:** Rotational motion, Rolling without Slipping, D'Alemberts Principle, Impact & Impulse.	5 Hours.	SAQs and Numerical
10	**Work, Power, Energy:** Work-Energy relation for particles and Rigid Bodies.	4 Hours.	SAQs and Numerical

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B : Practicals / Drawings / Design / Workshop

Term Work: Part-I: Graphical Solutions: **(Two Problems each)** and Part-II: Laboratory Experiments: **(Any Six)**

Sr.No.	Particulars
	Part - I
1	Resultant of Concurrent & Non-concurrent coplanar force systems.
2	Beam Reaction
3	Analysis of Pin Jointed Trusses.
4	ICR.
	Part - II
5	Parallelogram Law of Forces.
6	Lami's Force Table.
7	Beam Reactions.
8	Member forces in Truss.
9	Jib Crane.
10	Moment of Inertia of Fly Wheel.
11	Simple Screw Jack.
12	Differential Axle & Wheel.
13	Belt Friction.
14	Inclined Plane- Limiting Equilibrium.

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Engineering Mechanics	R. K. Bansal.	Laxmi Publication	Fourth
2	Engineering Mechanics	A. R. Basu.	Dhanpatrai & Sons	Second
3	Engineering Mechanics	I. B. Prasad.	Khanna Publications	Nineteenth
4	Engineering Mechanics	Nelson and Mclean	Mc Graw Hill Book Inc.	Second
5	Engineering Mechanics	Singer.	Harper & Raw Publisher, New York	Third
6	Applied Mechanics (Statics).	Beer & Johnston	Mc Graw Hill Book inc.	Second
7	Applied Mechanics (Dynamis)	Beer & Johnston.	Mc Graw Hill Book Inc.	Second
8	Applied Mechanics	Ramamurtham	Dhanpatrai & Sons	Fourth
9	Engineering Mechanics	R. S. Khurmi	S. Chand & Co. Ltd.	Thirteeth

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D. Digital references

Sr. No.	Website / Links / e-journals
1	www.springerlink.com - journal - acta mechanics
2	www.springerlink.com - journal - archive of applied mechanics
3	ASCE - journal of engineering mechanics
4	ASME - journal of applied mechanics

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Engineering Thermodynamics

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
3	1	--	--	20	80	100	4
--	--	2	25	--	--	25	1

Objective:

Thermodynamics is a basic science useful to all the branches of engineering and technology. The subject deals with the science of understanding the laws of nature and applying the same for the benefit of mankind. The subject will be useful to the student in studying a smallest to huge engineering systems from kitchen to spacecrafts in allied fields.

A : Theory

Unit	Contents	Duration	Nature
1	**Introduction:** Scope of thermodynamics, brief idea about various fields of applications.	2 Hours	Descriptive
2	**Fundamentals concepts and definitions:** Macroscopic and microscopic description of matter, pure substance, working substance, thermodynamic system, its types, thermodynamics state of system, thermodyanamic properties and processes, thermodynamic equilibrium, Zeroth law of thermodynamics, concept and measurement of temperature, temperature scales, pressure measuring devices	8 Hours	Descriptive & Analytical
3	**Work and heat:** thermodynamic definition of work, types of work, quasistatic process displacement work for different processes, definition of heat, comparison between heat and work.	5 Hours	Descriptive & Analytical
4	**First law of thermodynamics:** First law for closed system undergoing a cyclic and non-cyclic process. Internal energy as a property of a system, first law for open system and its applications.	7 Hours	Descriptive & Analytical
5	**Processes of Ideal Gases:** Ideal gases as working substance, Boyle's law, Avogadro's law, equation of state of an ideal gas, specific gas constant, Universal gas constant, Joule's law, processes, isometric, isobaric, isothermal, adiabatic, polytropic. Determination of energy quantities for non flow as well as steady flow processes, representation of the processes on P-V-T-S planes (simple type of numericals only on individual process and not on cycle)	6 Hours	Descriptive & Analytical
6	**Properties of steam:** Formation of steam, dryness fraction, properties of wet, superheated steam. Internal energy, enthalpy of evaporation. Steam table, T-h, T-s, h-s diagram, vapor processes.	7 Hours	Descriptive & Analytical
7	**Second Law of Thermodynamics:** Direct and reversed heat engines, Kelvin-Plank and Clausius statements and their equality, Reversible and irreversible processes, Carnot cycle, thermodynamic temperature scale	7 Hours	Descriptive & Analytical

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8	**Entropy:** Definition, calculation through Tds relations, T-s diagrams, entropy as measure of irreversibility	7 Hours	Descriptive & Analytical
9	**Power producing and consuming devices:** Classification, construction and working of steam engine, steam turbine, I.C.engine, Gas turbine, Construction and working of Domestic refrigerator air conditioner, air cooler.	7 Hours	Descriptive & Analytical
10	**Sources of energy:** various energy sources, need of renewable energy sources, its advantages, brief introduction to non -conventional energy sources.	4 Hours	Descriptive

B : Practicals / Drawings / Design / Workshop

Term work shall consist of a record book on laboratory exeperiments studies on the following; (minimum ten)

Sr.No.	Particulars
	Principle, Construction and Working of
1	Low pressure boiler (any one)
2	Boiler mountings
3	Boiler accessories
4	High-pressure boiler (any one)
5	Steam engine
6	Steam turbine
7	Refrigerator
8	Air conditioner
9	Air cooler
10	Assignment on chapter no 4
11	Assignment on chapter no 9
12	Assignment on chapter no 10

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Fundamentals of Classical Thermodynamics	P.K.Nag	John Wiley & Sons	4th
2	Thermal Engineering	R.K.Rajput		
3	Thermal Engineering	P.L.Ballany	Khanna	
4	Thermodynamic	C P Arora	Tata Mc Graw Hill	
5	Engineering Thermodynamic	Edward Arnold ad Hawkins J	John Wiley & Sons	

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Environment and Ecology

Structure:

Periods			Evaluation Scheme					Credits
			Sessional Exam			ESE	Total	
L	T	P	TA	CT	TOT			
2	--	--	--	10	40	50	2	2

Objective:

To study the direct and indirect effect of industrial products on enviornmental & ecological factors.

A : Theory

Unit	Contents	Duration	Nature
1	**General:** Introduction, components of the environment, environmental degradation	3 Hours.	Theoritical
2	**Ecology: Elements of Ecology:** Ecological balance and consequences of change, principles of environmental impact assessment.	3 Hours.	Theoritical
3	**Air pollution and Control:** Atmospheric composition, energy balance, climate, weather, dispersion, sources and effects of pollutants, primary and secondary pollutants, green house effect, depletion of ozone layer, standards and control measures.	7 Hours.	Theoritical
4	**Water pollution and control:** Hydrosphere, natural water, pollutants their origin and effects, river / lake / ground water pollution, standards and control.	7 Hours.	Theoritical
5	**Land pollution:** Litho-sphere, pollutants (municipal, industrial, commercial, agricultural, hazardous solid wastes): their origin and effects, collection and disposal of solid waste, recovery and conversion methods.	7 Hours.	Theoritical
6	**Noise pollution:** Sources, effects, standards and control	3 Hours.	Theoritical

B : Practicals / Drawings / Design / Workshop

Not Applicable

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Introduction to Envornmental Engineering	Masters, G.M.	Prentice Hall of India	1991
2	Enviornmetal Science	Nebel, B.J.	Prentice Hall Inc.	1987
3	Ecology : The Link Between The Natural and Social Sciences	Odum, E.P.	IBH Publishing Co., New Delhi.	

D. Digital references

Sr. No.	Website / Links / e-journals
1	Springer Journal/Clean Technologies and Enviromental Policies
2	Journal of Enviornmental Engineering
3	Natural Hazards Review

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Workshop Practice

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
--	--	--	--	--	--	--	--
--	--	2	75	--	--	75	1

Objective:

The subject intends to make aware and understand the hardship involved in engineering fields. Also to develop work culture and ability to work in a team and as individual to acquire skills. The subjects aims to make an engineer to do minor repairs on their own by making them tough (physically and mentally) to face the real world .

A : Theory

Not Applicable

B : Practicals / Drawings / Design / Workshop

Part I (Mechanical) is compulsory for all students and any one from Part-II (Computer or Electrical) is to be opted

Part - I (Mechanical) (Compulsory)		
Section	**Contents**	**Duration**
Fitting	Study of different tools of fitting & processes involved in fitting. Workshop diary – Sketches & description of fitting tools, Sketch of the job. Practical: One composite job involving simple fitting operation like Sawing, marking, filling& Tapping operation: Minimum one Job (Male – female fitting.)	14 Hours
Black smithy	Study of different smithy tools & processes. Workshop diary – Sketches & description of Smithy tools, Sketch of the job. Practical: Preparation of job one job making round cross section to square bar.	
Sheet metal working	Study of different sheet metal tools. Workshop diary – Sketches & description of sheet tools, Sketch of The job. Practical: one job involving development of surfaces, marking On sheet metal Cutting, bending, joint preparation by folding.	

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Part - II (Computers) (Optional)		
Overview of Computer System:	Parts of computers, computer hardware, units of measure for computer memory & storage., Input and Output devices., Types of storage devices., computer Software and Types. Common Tool	**14 Hours**
Parts of CPU	Power supply, Mother Boards and their types, Processors and types, RAM and types of RAM, Extension slots and types, Ports types and uses, Hard disk, Data cables and connections, Power cables and connection, Jumper setting, IDE and their types, CPU Assembling.	
BIOS	Types, Setting of BIOS, Installing HARD DISK, FLOPPY DRIVE, CDROMS, etc	
Installing Operating System	Booting from CD ROM, Partitioning Hard Disk, Formatting Hard Disk, Installing Operating System, Drivers Installation	
Adding New Hardwares	Installation of internal modem, LAN cards, sound cards, Display Cards, Printers, Scanner, Pen drives etc.	
Part - II (Electrical) (Optional)		
Testing	Components identification, specification and testing for a. Wires, Cables, Conductors b. Fuses, line testers c. Pliers of different types d. Wiring components like holders, switching plug tops, plug sockets, junction boxes, Ceiling roses MCBs etc.	**14 Hours**
Assembly	Testing of components and assembly of a fluorescent tube.	
Wiring	Wiring exercises/Stair case wiring and control of two lamps by two switches.	
Megger	Study and use of Megger Insulation tester.	
Trouble Shooting	Dismantling, assembly and fault finding of ceiling fans or table fan or automartic electric iron or plate tube water heater(megger testing included).	
Trouble Shooting	Dismantling, assembly and fault finding of mixer or single phase (capacitor start split phase) or identification of windings and polarities.	
Earthing	Earthing of electrical installations: Requirements, procedure, and testing.	
Energy Meter	Assembly and disassembly, fault finding and study of constructional details of instruments like PMMC or M.I. or Energy meter.	

The assessment of term work shall be done on the following:

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

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C. Suggetsed Text Books and References

Sr. No	Tiltle	Author	Publication	Edition
1	Workshop Technology	H.S.Bawa	Tata McGraw Hill Publishing Co. Ltd.	
2	A course in Workshop Technology	B.S. Raghuwanshi	Dhanpat Rai & Sons	
3	Elements of Workshop Technology	S.K.Hazra Chaudhary	Media Promoters & Publishers Pvt. Ltd	
4	Workshop Technology - Part I	W.A.Chapman.	Oxford & IBH Publishing Co.	
5	IBM PC and CLONES	Govindarajulu B	Tata McGraw Hill Publishing Co. Ltd.	
6	The Complete PC Upgrade and Maintenance Guide	Mark Minasi	BPB Publication	4th

D. Digital references

Sr. No	Website / Links / e-journals
1	www.cyberwalker.net
2	www.pcguide.com
3	www.buildasvpc.com
4	www.ictp.it
5	www.howstuffworks.com

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Development of Skills - II

Structure:

Periods			Evaluation Scheme				Credits
			Sessional Exam		ESE	Total	
L	T	P	TA	CT			
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--	--	2	50	--	--	50	1

Objective:

To help students sharpen their awareness of the English language and use it effectively in their personal, academic and professional communication

A : Theory

Not Applicable

B : Practicals / Drawings / Design / Workshop

Six assignments based on the topics mentioned			
Section	**Contents**	**Duration**	**Nature**
Communication Skills - II	Written Communication		
	A. Remedial English Grammar	**4 Hours**	
	B. Reading Comprehension and Vocabulary Enrichment	**6 Hours**	
Technical Writing & Business Correspondance	C. Writing Process		
	1. Writing as a process	**4 Hours**	
	2. Writing paragraphs	**4 Hours**	
	3. Writing short essays and articles	**2 Hours**	
	4. Writing Business Letters	**4 Hours**	
	5. Writing reports & proposals	**2 Hours**	
	6. Writing Memos, Notices, Circulars	**3 Hours**	
	7. Writing Resumes	**3 Hours**	

The assessment of term work shall be done on the following:

- Continuous assessment
- Oral examination conducted (internally) on the syllabus and term work mentioned above.

C. Suggetsed Text Books and References

Sr. No.	Tiltle	Author	Publication	Edition
1	Oxford Advanced Learner's Dictionary of Current English	A S Hornby	OUP	7th
2	Technical Writing and Professional Communication for Non-Native Speakers of English	T N Huckin and L A Olse	Mc Graw Hill	2nd
3	Developing Communication Skills	Krishna Mohan and Meena Bannergi	MacMillan India Limited	
4	Speaking English Effectively	Krishna Mohan and N P Singh	MacMillan India Limited	3rd
5	Business Correspondance and Report Writing	R C Sharma and Krishna Mohan	Tata Mc Graw Hill	4th
6	Communication Skills for Technical Students	T M Farhatullah	Orient Longman	
7	English Skills for Technical Students	WBSCTE, NBSCTE	Orient Longman	
8	Technical Writing: Process and Product	Sharon J Gerson and Steven Gerson	Prientice Hall	3rd
9	Excellence in Business Communication	John Thill & Bovee	Mc Graw Hill	2nd

D. Digital references

Sr. No.	Website / Links / e-journals
1	
2	
3	
4	
5	