ANNA UNIVERSITY TIRUCHIRAPPALLI
TIRUCHIRAPPALLI - 620 024

Regulations 2008
Curriculum

Common to all B.E. / B.Tech. Degree Programmes
(Except B.E. Marine Engineering)

SEMESTER I

S.No	Subject Code	Subject	L	T	P	C
		Theory				
1	**HS1101**	Technical English I	3	1	0	4
2	**MA1101**	Mathematics I	3	1	0	4
3	**HS1102**	Engineering Physics I	3	0	0	3
4	**HS1103**	Engineering Chemistry I	3	0	0	3
5	**ME1101**	Engineering Graphics	2	3	0	5
6	**CS1101**	Fundamentals of Computing and Programming	3	1	0	4
		Practical				
7	**CS1102**	Computer Practice Laboratory I	0	0	3	2
8	**GE1101**	Engineering Practices Laboratory	0	0	3	2
9	**HS1104**	Physics and Chemistry Laboratory I *	0	0	3	-
					Total	**27**

* **Laboratory classes on alternate weeks for Physics and Chemistry. The lab examinations (including the First Semester Experiments) will be held only in the second semester.**

SEMESTER II

S.No.	Subject Code	Subject	L	T	P	C
Theory						
1	**HS1151**	Technical English II*	3	1	0	4
2	**MA1151**	Mathematics II*	3	1	0	4
3	**HS1152**	Engineering Physics II*	3	0	0	3
4	**HS1153**	Engineering Chemistry II*	3	0	0	3
5 a b c	**CE1151** **EE1151** **EE1152**	Engineering Mechanics **(For all Non - Circuit Branches)** Circuit Theory **(Common to EEE,EIE and ICE Branches)** Electric Circuits and Electron Devices **(For ECE, CSE, IT and Bio-Medical Engineering Branches)**	3	1	0	4

6 a
 	
b
	EE1153
	
	GE1151
		Basic Electrical & Electronics Engineering
		(Common to branches under Civil, Mechanical
		  and Technology Faculties)
		Basic Civil & Mechanical Engineering
		(Common to branches under Electrical
		  Engineering and Information &
		Communication Engineering Faculties)
			4	0	0	4

Practical						
7	**CS1151**	Computer Practice Laboratory II*	0	1	2	2
8	**HS1154**	Physics & Chemistry Laboratory II*	0	0	3	2
9 a b c	**ME1151** **EE1154** **EE1155**	Computer Aided Drafting and Modeling Laboratory **(For all Non - Circuit Branches)** Electrical Circuits Laboratory **(Common to EEE,EIE and ICE Branches)** Circuits and Devices Laboratory **(For ECE, CSE, IT and Bio-Medical Engineering Branches)**	0 0 0	1 0 0	2 3 3	2
					Total : 28	

* Common to all B.E. / B.Tech. Programmes

LIST OF BRANCHES UNDER VARIOUS FACULTIES
NON – CIRCUIT BRANCHES

I Faculty of Civil Engineering

1. B.E. Civil Engineering

II Faculty of Mechanical Engineering

1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
3. B.E. Marine Engineering
4. B.E. Mechanical Engineering
5. B.E. Production Engineering

III Faculty of Technology

1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Polymer Technology
4. B.Tech. Textile Technology
5. B.Tech. Textile Technology (Fashion Technology)
6. B.Tech. Petroleum Engineering
7. B.Tech. Rubber and Plastics Technology

CIRCUIT BRANCHES

I Faculty of Electrical Engineering

1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

II Faculty of Information and Communication Engineering

1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.E. Bio Medical Engineering
4. B.Tech. Information Technology

ANNA UNIVERSITY TIRUCHIRAPPALLI
TIRUCHIRAPPALLI 620 024
Regulations 2008
Syllabus

SEMESTER I
(Common to all B.E. / B.Tech. Degree Programmes)

HS1101 - TECHNICAL ENGLISH I

	L	T	P	C
	3	1	0	4

UNIT I   FOCUS ON LANGUAGE: VOCABULARY   9+3

General Vocabulary - Changing words from one form to another - Nouns – Compound nouns – Adjectives, Comparative adjectives - Adverbs – Adverb forms – Prefixes and Suffixes – Spelling and Punctuation – British and American vocabulary .

UNIT II   FOCUS ON LANGUAGE: GRAMMAR   9+3

Subject-Verb Agreement - Tenses – Present Tense – Past Tense – Future Tense - Active and Passive Voice – Gerunds and Infinitives - Cause and Effect Expressions – 'If' conditionals – Correction of Errors.

UNIT III   READING   9+3

Skimming for gist – Scanning for specific information – Inference – Reading in Context – Intensive Reading - Graphic Presentation: Bar Chart and Flow Chart – Sequencing of Sentences.

UNIT IV   WRITING   9+3

Paragraph Writing – Description – Comparison and Contrast – Definition – Instructions – Formal Letter Writing – Letters to the Editor – Accepting and Declining an Invitation – Permission Letter.

UNIT V   LISTENING AND SPEAKING   9+3

Listening and transfer of information – Listening and Note-taking – Creative Thinking and Speaking – Conversation Techniques - Persuasive Speaking – Group Discussion and Oral Reports - Speaking about Future Plans.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Meenakshi Raman and Sangeeta Sharma, 'Technical Communication: English Skills for Engineers', New Delhi: Oxford University Press, 2008.

REFERENCES

1. Department of Humanities and Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 and 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 1 – 4 (Resources, Energy, Computer, Transport)
2. Andrea, J. Rutherford, 'Basic Communication Skills for Technology', Second Edition, Pearson Education, 2007.

MA1101 - MATHEMATICS I

	L	T	P	C
	3	1	0	4

UNIT I   MATRICES   9+3

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Problem solving using Cayley-Hamilton theorem – Similarity transformation – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Orthogonal reduction to its canonical form.

UNIT II   THREE DIMENSIONAL GEOMETRY   9+3

Angle between two lines – Coplanar lines – Shortest distance between skew lines – Equation of a sphere – Plane section of a sphere – Tangent plane – Orthogonal Spheres - Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

UNIT III   DIFFERENTIAL CALCULUS   9+3

Curvature – Cartesian and Parametric Co-ordinates – Centre and Radius of curvature – Circle of curvature – Envelopes – Evolutes.

UNIT IV   FUNCTIONS OF SEVERAL VARIABLES   9+3

Partial derivatives – Euler's theorem for homogeneous functions – Total derivative – Differentiation of implicit functions – Jacobians – Maxima / Minima for functions of two variables – Method of Lagrange's multipliers – Taylor's expansion.

UNIT V   ORDINARY DIFFERENTIAL EQUATIONS (ODE)   9+3

Solution of second and higher order linear ODE with constant coefficients – Simultaneous first order linear equations with constant coefficients – Linear equations of second order with variable coefficients – Cauchy's and Legendre's linear equations – Method of variation of parameter.

L: 45 T: 15 Total: 60

TEXT BOOKS
1.   Grewal, B.S, "Higher Engineering Mathematics", Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.
2.   Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.

REFERENCES
1.   Glyn James., "Advanced Modern Engineering Mathematics", Third Edition, Pearson Education Ltd, New Delhi, 2004.
2.   Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.
3.   Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Third edition, Laxmi Publications (P) Ltd., 2008.

HS1102 - ENGINEERING PHYSICS I

	L	T	P	C
	3	0	0	3

UNIT I   ULTRASONICS   9

Introduction – Production – magnetostriction effect - magnetostriction generator - piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves properties - Cavitations - Velocity measurement – Acoustic Grating - SONAR - Non Destructive Testing - Pulse echo system through transmission and reflection modes - A, B and C - scan displays – Applications of Ultrasonics - Industrial and Medical - Sonogram

UNIT II   LASERS   9

Introduction – Principle of Spontaneous emission and stimulated emission. Population inversion, pumping. Einsteins A and B coeffcients - derivation. Types of lasers – He - Ne, CO_2, Nd -YAG, Semiconductor lasers (homojunction and heterojunction) - Qualitative Industrial and Medical applications of Lasers - Holography – Construction and reconstruction of a Hologram-applications of a Hologram

UNIT III   FIBRE OPTICS   9

Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – Double crucible technique of fibre drawing - Losses in an optical fibre – Attenuation, Dispersion and Bending losses - Fibre optical communication system (Block diagram) - Light sources and detectors - Fibre optic sensors – Temperature and Displacement Sensors - Endoscope.

UNIT IV   QUANTUM PHYSICS   9

Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect -Theory and experimental verification – Matter waves - Electron microscope – Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box – Electrons in a metal - Degeneracy

UNIT V   CRYSTAL PHYSICS   9

Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – Interplanar spacing 'd' in a cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, Diamond and Graphite structures.

Total: 45

TEXT BOOKS

1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, 2003.
2. M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics', S.Chand and Company, Ltd., New Delhi, 2005.

REFERENCES

1. Chitra Shadrach and Sivakumar Vadivelu, 'Engineering Physics', Pearson Education, 2007.
2. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6th Edition, Thomson Brooks/Cole, Indian reprint 2007.
3. Arumugam, M, 'Engineering Physics', Anuradha Publishers, Kumabakonam 2005.
4. Palanisamy, P.K., 'Engineering Physics' Scitech publications, 2007.
5. Rajendran, V and Marikani A, 'Engineering Physics' Tata Mc Graw Hill Publications Ltd, III Edition, 2004.

HS1103 - ENGINEERING CHEMISTRY I

L T P C
3 0 0 3

UNIT I   WATER TREATMENT PROCESS   9

Alkalinity -Types of alkalinity and determination –- Hardness - Types - $CaCO_3$ equivalents - Estimation by EDTA method (problem) –- Boiler feed water – requirements - Troubles of using hard water in boilers –-Internal conditioning (phosphate, calgon and carbonate) - External conditioning - Zeolite process –-Domestic water treatment - Disinfection methods (Chlorination, UV treatment and ozonation) –- Desalination - Reverse osmosis.

UNIT II   SURFACE CHEMISTRY   9

Adsorption - Types –- Adsorption of gases on solids –- Adsorption isotherms – Frendlich and Langmuir isotherms –- Adsorption of solutes from solutions –- Role of adsorbents in catalysis –- Ion-exchange adsorption and Pollution abatement.

UNIT III   ELECTROCHEMISTRY   9

Electrochemical cells – Reversible and irreversible cells –- EMF - measurement of emf – Electrode potential – Nernst equation (problem) –- Reference electrodes - Standard hydrogen electrode - Calomel electrode - Glass electrode - Quinhydrone electrode and measurement of pH –- Electrochemical series - significance –- Conductometric titrations (HCl - NaOH titration) –- Potentiometric titrations (redox - Fe^{2+} vs dichromate and precipitation - Ag^+ vs Cl^- titrations).

UNIT IV   ENERGY SOURCES AND STORAGE DEVICES   9

Nuclear energy - Nuclear fission and fusion process –- Nuclear reactor - Light water nuclear power plant (block diagram only) - Breeder reactor –- Batteries - Alkaline battery - Lead acid storage battery - Nickel-Cadmium battery - Lithium batteries - Fuel cells - hydrogen-oxygen fuel cell –-Solar energy conversion - Solar cells - Wind energy.

UNIT V   ANALYTICAL TECHNIQUES   9

Beer-Lambert's law (problem) –- UV-Visible and IR spectroscopy - Principle and Instrumentation (problem) (block diagram only) –- Estimation of iron by colorimetric analysis –- Flame photometry - Principle and Instrumentation (block diagram only) – Estimation of sodium by flame photometry –- Atomic absorption spectroscopy - Principle and Instrumentation (block diagram only) – Estimation of Nickel by atomic absorption spectroscopy.

L: 45 Total: 45

TEXTBOOKS

1. P.C. Jain and Monika Jain, "Engineering Chemistry", 15th Edition, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2007.
2. S. Bahl, G.D. Tuli and Arun Bahl, "Essentials of Physical Chemistry", S. Chand and Company Ltd., New Delhi, 2004.

REFERENCES

1. J.C. Kuriakose and J. Rajaram, "Chemistry in Engineering and Technology", Vol.1 and 2, Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi, 1996.
2. B.K. Sharma, "Engineering Chemistry", Krishna Prakasam Media (P) Ltd., Meerut, 2001.
3. B. Sivasankar "Engineering Chemistry" Tate McGraw-Hill Pub.Co.Ltd, New Delhi (2008).

ME1101 - ENGINEERING GRAPHICS

	L	T	P	C
	2	3	0	5

Concepts and conventions (Not for Examination)   **1**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I   PLANE CURVES AND FREE HAND SKETCHING   15

Curves used in engineering practices:

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.

Free hand sketching:

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACES   14

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III   PROJECTION OF SOLIDS   15

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV   SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES   15

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   15

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective projection of prisms, pyramids and cylinders by visual ray method.

L: 30 T: 45 Total: 75

TEXT BOOKS

1. K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).
2. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education (2005).

REFERENCES

1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46th Edition, (2003).
2. Luzadder and Duff, 'Fundamentals of Engineering Drawing', Prentice Hall of India Pvt. Ltd. 11th Edition, 2001
3. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 and 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 and SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 and SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. Whenever the total number of candidates in a college exceeds 150, the University Examination in that college will be conducted in two sessions (FN and AN on the same day) for 50 percent of students (approx) at a time.

CS1101 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING

L T P C
3 1 0 4

UNIT I   DIGITAL CONCEPTS   9+3

Digital Computer Fundamentals – Block diagram of a computer – Components of a computer system – Digital and Analog quantities – Binary digits – Logic Levels – Digital Waveforms – Basic Logic operations – Digital Integrated Circuits.

UNIT II   NUMBER SYSTEMS   9+3

Number Representation – Decimal, Binary, Octal, Hexadecimal and BCD numbers – Binary Arithmetic – Binary addition – Unsigned and Signed numbers – one's and two's complements of Binary numbers – Arithmetic operations with signed numbers - Number system conversions – Digital codes.

UNIT III   HARDWARE AND SOFTWARE   9+3

Processing Devices – Memory Devices – Input and Output Devices – Optical Input Devices – Audiovisual Input Devices – Monitors – Printing Devices - Storage Devices – Magnetic and Optical Storage Devices - System Software – Application Software – Graphics and Multimedia.

UNIT IV   NETWORKING FUNDAMENTALS   9+3

Overview of Data Communication with Standard Telephone Lines and Modems, Digital Data Connections, Broadband Connections, DSL Technologies and Cable Modem Connections – Computer Networking Basics – Common Types of Networks – Structuring of Networks – Network Media and Hardware.

UNIT V   PROBLEM SOLVING AND C PROGRAMMING   9+3

Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode – Programming fundamentals – Variables and Data Types – Constants – Preprocessor – Operators and Expressions – Managing Input and Output operators – Decision Making – Branching and Looping – User-defined Functions – Declarations – Call by reference – Call by value – Arrays – Pointers – Handling of Character Strings – Structures and Unions.

L: 45 T: 15 Total: 60

TEXT BOOKS

1. Thomas L.Floyd and R.P.Jain,"Digital Fundamentals",8th Edition, Pearson Education,2007.
2. Peter Norton "Introduction to Computers",6th Edition, Tata Mc Graw Hill, New Delhi,2006.
3. Ashok.N.Kamthane, "Computer Programming", Pearson Education (India), 2008.

REFERENCES

1. Behrouz A. Forouzan and Richard.F.Gilberg, "A Structured Programming Approach Using C", II Edition, Brooks-Cole Thomson Learning Publications, 2007.
2. Morris Mano, "Digital Design", 3rd Edition, Pearson Education, 2006.
3. Albert Paul Malvino, Donald P. Leech, "Digital Principles and Applications", 6th Edition, Mc Graw Hill Publishers, 2007.

CS1102 - COMPUTER PRACTICE LABORATORY I

L	T	P	C
0	0	3	2

LIST OF EXERCISES

Concepts	Suggested Exercises
UNIT I	
Introduction to Application Packages	Practical Exercises may be given in the application packages to acquire skills in word processing ,Spread sheet and Power Point.
	1. Document creation, Text manipulation with Scientific notations.
	2. To create an advertisement in word.
Word	3. To illustrate the concept of mail merging, importing images, tables in word.
	4. Drawing - flow Chart
	5. Chart - Line, XY, Bar and Pie.
	6. Formula - formula editor.
Spreadsheet	7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet
	8. To create a spread sheet to analyze the marks of the students of a class and also to create appropriate charts.
	9. Sorting and Import / Export features.
Power Point	10. To create the presentation for the department with Power Point using animation, Design Templates and Effective presentation.
UNIT II	
C Programming Basics*	The following exercises may be suggested
Data types, Expression Evaluation, Condition Statements,Operators and Expressions	11. To write a simple menu driven calculator program using switch statement,
	12. To Find Age in terms of years, months and days.
IO Formatting	13. To print multiplication table for the given number.
Decision Making	14. To check and print if the given number is a palindrome or not, and the given number is a prime number or not
Looping	To print Fibonacci and Trigonometric series.

	Exercises may be given to understand function prototype and invocation procedures, to understand call by value, call by address and implement recursion.
UNIT III	
Arrays	15. To find the largest and smallest number using array
	16. To Sort numbers in an array in ascending / Descending order.
	17. To implement bubble sorting.
	18. To reverse the elements given in an array.
	19. Write a program for matrix addition and multiplication
String Manipulations	20. To implement string manipulation functions without using library functions.
	21. To arrange the names in alphabetic order.
Functions	22. To perform sequential search using functions.
Recursions	23. To find the factorial of a number using recursion.
UNIT IV	
Structures and Unions	24. To print the marksheet of 'n' students using structures.
Pointers	25. To print the elements of an array using pointers and String manipulation.
Files	26. To print the marksheet of 'n' students using file handling operations.
UNIT V	
Command line arguments	27. To merge two files using command line arguments.

Total:45

* For programming exercises Flow chart and Pseudo code are essential

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

Hardware
- LAN System with 33 nodes (OR) Standalone PCs – 33 Nos.
- Printers – 3 Nos.

Software
- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – C

GE1101 - ENGINEERING PRACTICES LABORATORY

L T P C
0 0 3 2

GROUP A (CIVIL AND MECHANICAL)

I CIVIL ENGINEERING PRACTICE   9

Buildings:

(a)   Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:

(a)   Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(b)   Study of pipe connections requirements for pumps and turbines.
(c)   Preparation of plumbing line sketches for water supply and sewage works.
(d)   Hands-on-exercise:
Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
(e)   Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

(a)   Study of the joints in roofs, doors, windows and furniture.
(b)   Hands-on-exercise:
Wood work, joints by sawing, planning and cutting.

II MECHANICAL ENGINEERING PRACTICE   13

Welding:

(a)   Preparation of arc welding of butt joints, lap joints and tee joints.
(b)   Gas welding practice.

Basic Machining:

(a)   Simple turning and Taper turning.
(b)   Drilling practice.

Sheet Metal Work:

(a)   Forming and Bending:
(b)   Model making – Trays, Funnels, etc.
(c)   Different type of joints.

Machine assembly practice:

(a)   Study of centrifugal pump.
(b)   Study of air conditioner.

Demonstration on:

(a)   Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
(b)   Foundry operations like mould preparation for gear and step cone pulley.
(c)   Fitting – Exercises – Preparation of square fitting and vee – fitting models.

GROUP B (ELECTRICAL AND ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE   10

1.   Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2.   Fluorescent lamp wiring.
3.   Stair-case wiring.
4.   Measurement of electrical quantities – voltage, current, power and power factor in RLC circuit.
5.   Measurement of energy using single phase energy meter.
6.   Measurement of resistance to earth of an electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE   13

1.   Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR.
2.   Study of logic gates AND, OR, EOR and NOT.
3.   Generation of Clock Signal.
4.   Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5.   Measurement of ripple factor of HWR and FWR.

P : 22+23 Total : 45

REFERENCES

1.   K.Jeyachandran, S.Natarajan and S, Balasubramanian, "A Primer on Engineering Practices Laboratory" , Anuradha Publications, 2007.

2.   T.Jeyapoovan, M.Saravanapandian and S.Pranitha, "Engineering Practices Lab Manual", Vikas Puplishing House Pvt.Ltd, 2006

3.   H.S. Bawa, "Workshop Practice", Tata McGraw – Hill Publishing Company Limited, 2007.

4.   A. Rajendra Prasad and P.M.M.S. Sarma, "Workshop Practice", Sree Sai Publication, 2002.

5.   P.Kannaiah and K.L.Narayana, "Manual on Workshop Practice", Scitech Publications, 1999.

SEMESTER EXAMINATION PATTERN

The Laboratory examination is to be conducted for Group A and Group B, allotting 90 minutes for each group, with a break of 15 minutes. Both the examinations are to be taken together in sequence, either in the FN session or in the AN session. The maximum marks for Group A and Group B lab examinations will be 50 each, totaling 100 for the Lab course. The candidates shall answer either I or II under Group A and either III or IV under Group B, based on lots.

Engineering Practices Laboratory- List of equipment and components
(For a Batch of 30 Students)

CIVIL

1.	Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings.	15 Sets.
2.	Carpentry vice (fitted to work bench)	15 Nos.
3.	Standard woodworking tools	15 Sets.
4.	Models of industrial trusses, door joints, furniture joints	5 each.
5.	Power Tools: (a) Rotary Hammer	2 Nos.
	(b) Demolition Hammer	2 Nos.
	(c) Circular Saw	2 Nos.
	(d) Planer	2 Nos.
	(e) Hand Drilling Machine	2 Nos.
	(f) Jigsaw	2 Nos.

MECHANICAL

1.	Arc welding transformer with cables and holders	5 Nos.
2.	Welding booth with exhaust facility	5 Nos.
3.	Welding accessories like welding shield, chipping hammer, wire brush, etc.	5 Sets.
4.	Oxygen and acetylene gas cylinders, blow pipe and other welding outfit.	2 Nos.
5.	Centre lathe	2 Nos.
6.	Hearth furnace, anvil and smithy tools	2 Sets.
7.	Moulding table, foundry tools	2 Sets.
8.	Power Tool: Angle Grinder	2 Nos.
9.	Study-purpose items: centrifugal pump, air-conditioner	1 each.

ELECTRICAL

1.	Assorted electrical components for house wiring	15 Sets.
2.	Electrical measuring instruments	10 Sets.
3.	Study purpose items: Iron box, fan and regulator, emergency lamp	1 each.
4.	Megger (250V/500V)	1 No.
5.	Power Tools: (a) Range Finder	2 Nos.
	(b) Digital Live-wire detector	2 Nos.

ELECTRONICS

1.	Soldering guns	10 Nos.
2.	Assorted electronic components for making circuits	50 Nos.
3.	Small PCBs	10 Nos.
4.	Multimeters	10 Nos.
5.	Study purpose items: Telephone, FM radio, low-voltage power supply	

HS1104 - PHYSICS CHEMISTRY LABORATORY I

L   T   P   C
0   0   3   -

PHYSICS LABORATORY I

LIST OF EXPERIMENTS

1. (a) Particle size determination using Diode Laser.
    (b) Determination of Laser parameters – Wavelength, and Angle of divergence.
    (c) Determination of Acceptance angle in an Optical Fiber.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
4. Determination of wavelength of Mercury spectrum – Spectrometer grating.
5. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
6. Determination of Hysteresis loss in a Ferromagnetic material.

CHEMISTRY LABORATORY I

LIST OF EXPERIMENTS

1. Estimation of Hardness of Water by EDTA method.
2. Estimation of Copper in brass by EDTA method.
3. Determination of DO in water by Winkler's method.
4. Estimation of Chloride in Water sample by Argentometric method.
5. Estimation of alkalinity of Water sample.
6. Determination of molecular weight and degree of polymerization using Viscometry.

- **A minimum of FIVE experiments shall be offered.**
- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**

SEMESTER II

HS1151 - TECHNICAL ENGLISH II

L   T   P   C
3   1   0   4

UNIT I   FOCUS ON LANGUAGE: VOCABULARY   9+3

Technical Vocabulary – Synonyms and antonyms - Different grammatical forms of the same word – Numerical adjectives – Articles – Conjunctions and prepositions – Conjunctions used in adverbial phrases and clauses – Abbreviations and acronyms – Foreign words and phrases.

UNIT II   FOCUS ON LANGUAGE: GRAMMAR   9+3

Phrases and structures indicating use and purpose – Cause and effect expressions – Using connectives – Imperative and 'should' – Yes/ No question forms – Reported speech – Relative clauses – Adverbial clauses of time, place and manner .

UNIT III   READING   9+3

Intensive reading and predicting content – Meanings in context - Reading and interpretation – Critical reading – Creative and critical thinking – Note-making.

UNIT IV   WRITING   9+3

Paragraph development - Process description – Descriptive writing - Writing analytical paragraphs – Recommendations – Instructions – Checklists - Letter of application – content, format – Writing an essay – Proposals – Report Writing – Types, format, structure, data collection, content, form.

UNIT V   LISTENING AND SPEAKING   9+3

Non-verbal communication – Listening – Stress and intonation - Correlating verbal and non-verbal communication – Speaking in group discussions – Discussion of problems and solutions – Oral instructions.

L: 45 T: 15 Total: 60

TEXT BOOK

1.   Meenakshi Raman and Sangeeta Sharma, 'Technical Communication: English Skills for Engineers', New Delhi: Oxford University Press, 2008.

REFERENCES

1.   Department of Humanities and Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 and 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 1 – 4 (Resources, Energy, Computer, Transport) .

2.   Andrea, J. Rutherford, 'Basic Communication Skills for Technology', Second Edition, Pearson Education, 2007.

MA1151 - MATHEMATICS II

L T P C
3 1 0 4

UNIT I   LAPLACE TRANSFORMS   9+3

Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse Laplace transforms – Convolution theorem – Solution of Ordinary Differential Equations with constant coefficients using Laplace transforms – Transform of periodic functions – Solution of integral equations.

UNIT II   VECTOR CALCULUS   9+3

Gradient, Divergence and Curl – Directional derivative – Irrotational and Solenoidal vector fields – Vector integration – Problem solving using Green's theorem, Gauss divergence theorem and Stoke's theorem – Simple applications and verifications.

UNIT III   ANALYTIC FUNCTIONS   9+3

Necessary and Sufficient conditions (without proof) – Cauchy-Riemann equations – Properties of analytic functions – Harmonic conjugate – Construction of Analytic functions – Conformal mapping: $w = z+a$, az, $1/z$, Z^2 and bilinear transformation.

UNIT IV   MULTIPLE INTEGRALS   9+3

Double integration – Cartesian and Polar Co-ordinates – Change of order of integration – Area as a double integral – Change of variables between Cartesian and Polar Co-ordinates – Triple integration – Volume as a triple integral.

UNIT V   COMPLEX INTEGRATION   9+3

Problems solving using Cauchy's integral theorem and integral formula – Taylor's and Laurent's expansions – Residues – Cauchy's residue theorem – Contour integration over unit circle – Semicircular contours with no pole on real axis.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Grewal, B.S., "Higher Engineering Mathematics", Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.
2.   Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.

REFERENCES

1.   Glyn James., "Advanced Modern Engineering Mathematics", Third Edition,Pearson Education Ltd, New Delhi, 2004.
2.   Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.
3.   Bali N. P and Manish Goyal, " Text book of Engineering Mathematics", Third edition, Laxmi Publications(p) Ltd., 2008.

HS1152 - ENGINEERING PHYSICS II

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	3	0	0	3

UNIT I   CONDUCTING MATERIALS   8

Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

UNIT II   SEMICONDUCTING MATERIALS   9

Intrinsic semiconductor – carrier concentration derivation – Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – extrinsic semiconductors – carrier concentration in n-type and p-type semiconductor (Qualitative) – variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall effect –Determination of Hall coefficient – Applications.

UNIT III   MAGNETIC AND SUPERCONDUCTING MATERIALS   10

Origin of magnetic moment – Bohr magneton – Dia and para magnetism – Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications – magnetic recording and readout – storage of magnetic data – tapes, floppy and magnetic disc drives.

Superconductivity : properties - Types of super conductors – BCS theory of superconductivity (Qualitative) - High Tc superconductors – Applications of superconductors – Josephson Effect – Josephson Junction -SQUID, Cryotron, Magnetic levitation.

UNIT IV   DIELECTRIC MATERIALS   9

Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarisation – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials (capacitor and transformer) – Ferroelectricity and applications.

UNIT V   MODERN ENGINEERING MATERIALS   9

Metallic glasses: preparation, properties and applications.

Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA

Nanomaterials: synthesis –plasma arcing – pulsed laser deposition - chemical vapour deposition – sol-gel – electrodeposition – ball milling - properties of nanoparticles and applications.

Carbon nanotubes: structure, properties and applications.

Total: 45

TEXT BOOKS

1. Charles Kittel ' Introduction to Solid State Physics', John Wiley and sons, 7th Edition, Singapore (2007)

2. Charles P. Poole and Frank J.Ownen, 'Introduction to Nanotechnology', Wiley India(2007) (for Unit V).

REFERENCES

1. Chitra Shadrach and Sivakumar Vadivelu, 'Engineering Physics', Pearson Education, New Delhi, (2007).

2. M. Arumugam, 'Materials Science' Anuradha publications, Kumbakonam, (2006).

3. Palanisamy P.K, 'Materials science', Scitech publications(India) Pvt. LTd., Chennai, 2nd Edition (2007).

4. Rajendran, V, and Marikani A, 'Materials science' TMH publications, (2004) New Delhi.

5. Jayakumar, S. 'Materials science', R.K. Publishers, Coimbatore, (2008).

HS1153 - ENGINEERING CHEMISTRY II

	L	T	P	C
	3	0	0	3

UNIT I   ENGINEERING MATERIALS   9

Abrasives - Natural abrasives (quartz, corundum, emery, garnet, diamond) - Synthetic abrasives (silicon carbide and boron carbide) –- Refractories -classification (acidic, basic and neutral refractories) - Properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) - Manufacture of alumina, magnesite and zirconia bricks –- Lubricants - Mechanism of lubrication, Liquid lubricants - Properties (viscosity index, flash and fire points, cloud and pour points, oiliness) - Solid lubricants - Graphite and Molybdenum disulphide.

UNIT II   CORROSION AND PROTECTIVE COATINGS   9

Chemical and Electrochemical corrosion - Galvanic corrosion - Differential aeration corrosion –- Corrosion control - Sacrificial anode and Impressed current cathodic methods - Corrosion inhibitors; Protective coatings - Paints - constituents and functions –- Metallic coatings - Electroplating (Au) and Electroless (Ni) plating - Surface conversion coating and Hot dipping.

UNIT III   HIGH POLYMERS   9

Polymers - Definition –- Polymerization - Addition and Condensation polymerization –- Free radical polymerization mechanism –- Preparation, properties and uses of PVC, Teflon, Polystyrene, Polycarbonate, Polyurethane, Nylon-6,6, PET, Bakelite and Epoxy resins –- Rubber - Vulcanization of rubber - Synthetic rubbers (butyl rubber and SBR) –- Compounding of plastics - Injection moulding - Compression moulding.

UNIT IV   FUELS AND COMBUSTION   9

Coal - Proximate and Ultimate analysis –- Metallurgical coke – Manufacture by Otto-Hoffman oven's –- Petroleum processing and fractions –- Cracking – Catalytic cracking methods –- Synthetic petrol - Bergius and Fischer-Tropsch method –- Knocking –- Octane number and Cetane number –- Gaseous fuels – Water gas, Producer gas, CNG and LPG; Combustion –- Calorific values – Types –- Theoretical calculation of calorific values (simple problem) –- Calculation of minimum requirement of air (simple problem) –- Flue gas analysis - Orsat's apparatus.

UNIT V   CHEM-INFORMATICS   9

Definition – coordinate – Bonds - Bond length - Bond angles - Torsional angles –- Chemical structure –- Conformation –- Representation of structural information –- Linear format - SMILEYS notation –- MOL format –- PDB format –- Storage of structural data in a data base –- Canonical structure –- Similarity search –- Sub structure search - Structural keys – Finger print –- Application of chem-informatics in drugs designing.

Total: 45

TEXTBOOKS
1. P. C.Jain and Monika Jain, "Engineering Chemistry", 15th Edition, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2007.
2. Andrew Leach, "Molecular Modeling concept and Application", 2nd Edition, Pearson Edn., Ltd., ESSEX, England, 2001.

REFERENCES
1. J. C. Kuriakose and J. Rajaram, "Chemistry in Engineering and Technology", Vol.1 and 2, Tata Mcgraw Hill Publishing Company, New Delhi, 1996.
2. B. K. Sharma, "Engineering Chemistry", Krishna Prakasam Media (P) Ltd., Meerut, 2001.
3. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Publishing Co. Ltd, New Delhi, 2008.

CE1151 - ENGINEERING MECHANICS
(For all Non-Circuit Branches)

L T P C
3 1 0 4

UNIT I   BASICS AND STATICS OF PARTICLES   12

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

UNIT II   EQUILIBRIUM OF RIGID BODIES   12

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples.

UNIT III   PROPERTIES OF SURFACES AND SOLIDS   12

Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, - Angle section, Hollow section by using standard formula – second and product moments of plane area – Rectangle, triangle, circle from integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Derivation of mass moment of inertia for rectangular section, prism, sphere from first principle – Relation to area moments of inertia.

UNIT IV   DYNAMICS OF PARTICLES   12

Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion – Newton's law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies.

UNIT V   FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS   12

Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt friction.
Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion.

Total: 60

TEXT BOOKS

1.   Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", 4th Edition – Pearson Education Asia Pvt. Ltd., (2003).

2.   M.V Seshagiri Rao and D Rama Durgaiah, ' Engineering Mechanics" University Press 2005 .

REFERENCES

1.   Beer, F.P and Johnson Jr. E.R. "Vector Mechanics for Engineers", Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (1997).

2.   Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).

3.   K V Natarajan, 'Engineering Mechanics', Dhanalakshmi Publishers, Chennai 2006 .

4.   Palanichamy, M.S., Nagam, S., "Engineering Mechanics – Statics and Dynamics", Tata McGraw-Hill, (2001).

5.   Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).

EE1151 - CIRCUIT THEORY
(Common to EEE, EIE and ICE Branches)

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UNIT I   BASIC CIRCUITS ANALYSIS   9 + 3

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits.

UNIT II   NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS   9 + 3

Network reduction: voltage and current division, source transformation – star delta conversion. Thevenin's and Norton's Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT III   RESONANCE AND COUPLED CIRCUITS   9 + 3

Series and paralled resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

UNIT IV   TRANSIENT RESPONSE OF DC AND AC CIRCUITS   9 + 3

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input.

UNIT V   ANALYSING THREE PHASE CIRCUITS   9 + 3

Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced and un balanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

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L: 45 T: 15 Total: 60

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TEXT BOOKS

1.   William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", TMH publishers, 6th edition, New Delhi, (2002).
2.   Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", Tata McGraw Hill, (2007).

REFERENCES

1.   Paranjothi SR, "Electric Circuits Analysis," New Age International Ltd., New Delhi, (1996).
2.   Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi (2001).
3.   Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai and Sons, New Delhi, (1999).
4.   Charles K. Alexander, Mathew N.O. Sadik, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, (2003).

EE1152 - ELECTRIC CIRCUITS AND ELECTRON DEVICES

(For ECE, CSE, IT and Biomedical Engineering Branches)

	L	T	P	C
	3	1	0	4

UNIT I   CIRCUIT ANALYSIS TECHNIQUES   **9 + 3**

Kirchoff's current and voltage laws – series and parallel connection of independent sources – R, L and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-Delta conversion.

UNIT II   TRANSIENT RESPONSE AND RESONANCE IN RLC CIRCUITS   9 + 3

Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs – frequency response – Parallel and series resonances – Q factor – single tuned and double tuned circuits.

UNIT III   SEMICONDUCTOR DIODES   **9 + 3**

Review of intrinsic and extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation – space charge and diffusion capacitances – effect of temperature and breakdown mechanism – Zener diode and its characteristics.

UNIT IV   TRANSISTORS   **9 + 3**

Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

UNIT V   SPECIAL SEMICONDUCTOR DEVICES (Qualitative Treatment only)

9+3

Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Robert T. Paynter, "Introducing Electronics Devices and Circuits", Pearson Education, 7th Edition, (2006).

2.   Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" Schaum's Series, TMH, (2001).

REFERENCES

1.   David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, (2008).

2.   S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "Electronic Devices and Circuits", 2nd Edition, (2008).

3.   William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, "Engineering Circuit Analysis", TMH, 6th Edition, 2002.

4.   J. Millman and Halkins, Satyebranta Jit, "Electronic Devices and Circuits", TMH, 2nd Edition, 2008.

EE1153 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to branches under Civil, Mechanical and Technology Faculties)

	L	T	P	C
	4	0	0	4

UNIT I ELECTRICAL CIRCUITS AND MEASURMENTS **12**

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits.

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

UNIT II ELECTRICAL MACHINES **12**

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS **12**

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation.

Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

UNIT IV DIGITAL ELECTRONICS **12**

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts).

UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING **12**

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

Total: 60

TEXT BOOKS

1. Mittle V.N., "Basic Electrical Engineering", TMH Edition, New Delhi, 1990.
2. Sedha, R.S., "Applied Electronics" S. Chand and Co., 2006.

REFERENCES

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", TMH, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
3. Mehta V K, "Principles of Electronics", S.Chand and Company Ltd, (1994).
4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).

GE1151 - BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to branches under Electrical and I and C Faculties)

L	T	P	C
4	0	0	4

A – CIVIL ENGINEERING

UNIT I   SURVEYING AND CIVIL ENGINEERING MATERIALS   15

Surveying: Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel sections.

UNIT II   BUILDING COMPONENTS AND STRUCTURES   15

Foundations: Types, Bearing capacity – Requirement of good foundations.

Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

Total: 30

B – MECHANICAL ENGINEERING

UNIT III   POWER PLANT ENGINEERING   10

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

UNIT IV   I C ENGINES   10

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V   REFRIGERATION AND AIR CONDITIONING SYSTEM   10

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner.

Total: 30

REFERENCES

1   Shanmugam G and Palanichamy M S, "Basic Civil and Mechanical Engineering", TMH Publishing Co., New Delhi, (1996).

2   Ramamrutham. S, "Basic Civil Engineering", Dhanpat Rai Publishing Co. (P) Ltd. (1999).

3   Seetharaman S. "Basic Civil Engineering", Anuradha Agencies, (2005).

4   Venugopal K and Prahu Raja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).

5   Shantha Kumar S R J., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, (2000).

CS1151 - COMPUTER PRACTICE LABORATORY II

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- Basic commands in UNIX.
- Working with Files
    - Files and File types.
    - Sorting the contents of a File.
    - Counting the number of words in a File.
- Working with Directories.
- UNIX Editor.
- Pipes.
- Simple Filters.
- Command line parameters with simple UNIX commands.
- Shell Programming Fundamentals
    - Shell variables.
    - Conditional statements.
    - Testing and Loops.
    - Simple shell programs.
    - Grep and Sed commands.
    - Awk filter.
    - Security commands.
- UNIX C
    - Simple C programs to simulate the basic UNIX commands (Fork, Signal).
    - File handling .

HARDWARE/SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware
➢ 1 UNIX Clone Server.
➢ 33 Nodes (thin client or PCs).
➢ Printer - 3Nos.

Software
➢ OS-UNIX clone (33 user license or License free Linux).
➢ Compiler - C .

T: 15 P: 30 Total: 45

HS1154 - PHYSICS AND CHEMISTRY LABORATORY II

PHYSICS LABORATORY II

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0 0 3 2

LIST OF EXPERIMENTS

1.   Determination of Young's modulus of the material – Non uniform bending.
2.   Determination of Band Gap of a semiconductor material.
3.   Determination of Specific resistance of a given coil of wire – Carey Foster Bridge.
4.   Determination of Viscosity of liquid – Poiseuille's method.
5.   Spectrometer Dispersive power of a prism.
6.   Determination of Young's modulus of the material – Uniform bending.
7.   Torsional pendulum – Determination of Rigidity modulus.

CHEMISTRY LABORATORY II

L T P C
0 0 3 2

LIST OF EXPERIMENTS

1.   Conductometric Titration (Simple acid base).
2.   Conductometric Titration (Mixture of weak and strong acids).
3.   Conductometric Titration using $BaCl_2$ vs Na_2SO_4.
4.   Potentiometric Titration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$).
5.   pH Titration (acid and base).
6.   Determination of water of crystallization of a crystalline salt (Copper sulphate).
7.   Estimation of Ferric iron by spectrophotometry.

- **A minimum of FIVE experiments shall be offered.**
- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**

ME1151 - COMPUTER AIDED DRAFTING AND MODELING LABORATORY
(For All Non-Circuit Branches)

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L   T   P   C
0   1   2   2
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List of Exercises using software capable of Drafting and Modeling

1.   Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.

2.   Drawing of a Title Block with necessary text and projection symbol.

3.   Drawing of curves like parabola, spiral, involute using B-spline or cubic spline.

4.   Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.

5.   Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).

6.   Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.,).

7.   Drawing of a simple steel truss.

8.   Drawing sectional views of prism, pyramid, cylinder, cone, etc,

9.   Drawing isometric projection of simple objects.

10.   Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

List of Equipments for a batch of 30 students:

1.   Pentium IV computer or better hardware, with suitable graphics facility - 30 No.
2.   Licensed software for Drafting and Modeling. – 30 Licenses.
3.   Laser Printer or Plotter to print / plot drawings – 2 No.

EE1154 - ELECTRICAL CIRCUITS LABORATORY
(Common to EEE, EIE and ICE Branches)

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. Verification of Ohm's laws and Kirchoff's laws.
2. Verification of Thevenin's and Norton's Theorem.
3. Verification of Superposition Theorem.
4. Verification of Maximum power transfer theorem.
5. Verification of Reciprocity theorem.
6. Measurement of Self inductance of a coil.
7. Verification of Mesh and Nodal analysis.
8. Transient response of RL and RC circuits for DC input.
9. Frequency response of Series and Parallel resonance circuits.
10. Frequency response of Single tuned coupled circuits.

Total: 45

EE1155 - CIRCUITS AND DEVICES LABORATORY
(For ECE, CSE, IT and Bio-Medical Engineering Branches)

L	T	P	C
0	0	3	2

1. Verification of KVL and KCL.
2. Verification of Thevenin's and Norton's Theorems.
3. Verification of Superposition Theorem.
4. Verification of Maximum power transfer and reciprocity theorems.
5. Frequency response of Series and Parallel resonance circuits.
6. Characteristics of PN and Zener diode.
7. Characteristics of CE configuration.
8. Characteristics of CB configuration.
9. Characteristics of UJT and SCR.
10. Characteristics of JFET and MOSFET.
11. Characteristics of Diac and Triac.
12. Characteristics of Photodiode and Phototransistor.

Total: 45

LIST OF BRANCHES UNDER VARIOUS FACULTIES

NON – CIRCUIT BRANCHES

I Faculty of Civil Engineering
1. B.E. Civil Engineering.

II Faculty of Mechanical Engineering
1. B.E. Aeronautical Engineering .
2. B.E. Automobile Engineering.
3. B.E. Marine Engineering.
4. B.E. Mechanical Engineering.
5. B.E. Production Engineering.

III Faculty of Technology
1. B.Tech. Chemical Engineering.
2. B.Tech. Biotechnology.
3. B.Tech. Polymer Technology .
4. B.Tech. Textile Technology.
5. B.Tech. Textile Technology (Fashion Technology).
6. B.Tech. Petroleum Engineering .
7. B.Tech. Rubber and Plastics Technology.

CIRCUIT BRANCHES

I Faculty of Electrical Engineering
1. B.E. Electrical and Electronics Engineering.
2. B.E. Electronics and Instrumentation Engineering.
3. B.E. Instrumentation and Control Engineering.

II Faculty of Information and Communication Engineering
1. B.E. Computer Science and Engineering.
2. B.E. Electronics and Communication Engineering.
3. B.E. Bio Medical Engineering.
4. B.Tech. Information Technology.