ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT (AUTONOMOUS)
TEKKALI
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
B.Tech Course structure

I B.TECH **I – SEMESTER**

S.No	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13HS1001	English-I	3	1	-	3	30	70
02	13HS1003	Environmental Studies	3	1	-	3	30	70
03	13BS1001	Engineering Mathematics-I	3	1	-	3	30	70
04	13BS1005	Engineering Chemistry	3	1	-	3	30	70
05	13EE1001	Fundamentals of Electrical Engineering	3	1	-	3	30	70
06	13ME1003	Engineering Mechanics	3	1	-	3	30	70
07	13BS1102	Engineering Chemistry Lab	-	-	3	2	25	50
08	13EE1101	Basic Electrical Engineering Lab	-	-	3	2	25	50
09	13CS1103	IT Workshop	-	-	3	2	25	50
TOTAL PERIODS/TOTAL CREDITS			**33**			**24**	**825**	

I B.TECH **II– SEMESTER**

S.No	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13HS1002	English-II	2	1	-	2	30	70
02	13CS1001	Computer Programming	3	1	-	3	30	70
03	13BS1002	Engineering Mathematics-II	3	1	-	3	30	70
04	13BS1003	Engineering Mathematics-III	3	1	-	3	30	70
05	13BS1004	Engineering Physics	3	1	-	3	30	70
06	13ME1001	Engineering Drawing	1	-	3	3	30	70
07	13HS1101	Basic English Language Communication Skills Lab	-	-	3	2	25	50
08	13CS1101	Computer Programming Lab	-	-	3	2	25	50
09	13ME1101	Engineering Workshop	-	-	3	2	25	50
10	13BS1101	Engineering Physics Lab	-	-	3	2	25	50
TOTAL PERIODS/TOTAL CREDITS			**35**			**25**	**900**	

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II B.TECH **I – SEMESTER**

S. No.	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13EC2007	Electronic Devices and Circuits	3	1	-	3	30	70
02	13EE2004	Electrical Circuit Analysis-I	3	1	-	3	30	70
03	13EE2005	Electrical Machines – I	3	1	-	3	30	70
04	13EE2006	Electro Magnetic Fields	3	1	-	3	30	70
05	13ME2008	Fluid Mechanics & Hydraulic Machines	3	1	-	3	30	70
06	13EC2003	Switching theory and logic design	3	1	-	3	30	70
07	13EC2102	Electronic Devices and Circuits Lab	-	-	3	2	25	50
08	13ME2106	Fluid Mechanics & Hydraulic Machines Lab	-	-	3	2	25	50
09	13HS2102	Advanced English Language Communication Skills Lab			3	2	25	50
10	13HS2201	Professional Ethics and Morals	2	-	-	-	-	-
TOTAL PERIODS/TOTAL CREDITS			**35**			**24**	**825**	

II B.TECH **II– SEMESTER**

S. No.	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13BS2007	Complex variables and statistical methods	3	1	-	3	30	70
02	13EE2009	Control Systems	3	1	-	3	30	70
03	13EE2010	Electrical Circuit Analysis-II	3	1	-	3	30	70
04	13EE2011	Electrical Machines – II	3	1	-	3	30	70
05	13EE2012	Power Systems – I	3	1	-	3	30	70
06	13EE2104	Electrical Machines- I Lab	-	-	3	2	25	50
07	13EE2105	Electrical Circuit Analysis Lab	-	-	3	2	25	50
08	13EE2106	Control Systems Lab	-	-	3	2	25	50
09	13EE2201	Self study course-I (4 Periods)	-	-	-	1	75	-
TOTAL PERIODS/TOTAL CREDITS			**33**			**22**	**800**	

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III B.TECH **I - SEMESTER**

S. No.	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13EE3014	Power systems-II	3	1	-	3	30	70
02	13EE3015	Electrical Machines – III	3	1	-	3	30	70
03	13EE3016	Electrical Measurements	3	1	-	3	30	70
04	13EC3016	Linear Digital Integrated Circuits	3	1	-	3	30	70
05	13EC3017	Pulse and digital circuits	3	1	-	3	30	70
06	13EC3018	Signals and Systems	3	1	-	3	30	70
07	13EE3107	Electrical Machines – II Lab	-	-	3	2	25	50
08	13EE3108	Electrical Measurements Lab	-	-	3	2	25	50
09	13HS3202	IPR & Patents	2	-	-	-	-	-
TOTAL PERIODS/TOTAL CREDITS			**32**			**22**	**750**	

III B.TECH **II - SEMESTER**

S. No	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13EE3017	Power Systems – III	3	1	-	3	30	70
02	13HS3005	Managerial Economics & Management Science	3		-	2	30	70
03	13EE3018	Power Electronics	3	1	-	3	30	70
04	13CS3008	Computer Organization and Architecture	3	1	-	3	30	70
05		Elective – I	3	1	-	3	30	70
	13EE3019	UNIX and Shell Programming						
	13EE3020	H.V.D.C. Transmission						
	13EE3021	Extra High voltage Transmission						
06	13EE3109	Power systems Lab	-	-	3	2	25	50
07	13EE3110	Power Electronics Lab	-	-	3	2	25	50
08	13EE3111	Industrial Automation Lab	-	-	4	3	25	50
09	13EE3202	Self study course-II (4 Periods)		-	-	1	75	-
TOTAL PERIODS/TOTAL CREDITS			**33**			**22**	**800**	

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IV B.TECH **I - SEMESTER**

S. No.	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13EE4022	Power Semi conductor Drives	3	1	-	3	30	70
02	13EE4023	Power System Analysis	3	1	-	3	30	70
03	13EE4024	Power System Operation and Control	3	1	-	3	30	70
04	13EC4019	Micro processor and micro controllers	3	1		3	30	70
05		Elective – II	3	1	-	3	30	70
\	13EE4025	High Voltage Engineering						
	13EE4026	Electrical Machine Design						
	13EE4027	Artificial Neural Networks and Fuzzy Logic						
	13EE4028	Database Management Systems						
06		Open Elective	3	1	-	3	30	70
	13OE4001	Air Quality Management						
	13OE4002	Cyber Losses						
	13OE4003	Entrepreneur Development						
	13OE4004	Industrial Safety and Environment						
	13OE4005	Micro Electro Mechanical Systems						
	13OE4006	Optimization Techniques						
	13OE4007	Renable Energy						
	13OE4008	Smart Materials						
	13OE4009	Total Quality Management						
07	13EC4109	Micro processor and micro controllers Lab	-		3	2	25	50
08	13EE4112	Electrical simulation lab with simulink	-		4	3	25	50
09	13HS4203	Employability skills	-	-	3	2	75	-
TOTAL PERIODS/TOTAL CREDITS			**34**			**25**	**825**	

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IV B.TECH **II - SEMESTER**

S. No.	Sub.Code	SUBJECT	L	T	P	C	Int	Ext
01	13EE4029	Utilization of Electrical Engineering	3	1	-	3	30	70
02		Elective – III	3	1	-	3	30	70
	13EE4030	Digital Control Systems						
	13EE4031	Advanced Control Systems						
	13EE4032	Electrical Distribution Systems						
	13EE4033	Instrumentation						
03		Elective – IV	3	1	-	3	30	70
	13EE4034	Operational Research						
	13EE4035	Digital Signal Processing						
	13EE4036	VLSI Design						
	13EE4037	Power Quality Management						
04	13EE4203	Internship	-	-	-	1	25	50
05	13EE4204	Project Work	6	-	-	6	60	140
TOTAL PERIODS/TOTAL CREDITS			**18**			**16**	**575**	

TOTAL CREDITS : 180

TOTAL MARKS : 6300

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT (AUTONOMOUS)

TEKKALI

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech Course structure

YEAR- SEM.	TOTAL PERIODS	TOTAL CREDITS	TOTAL MARKS
I-I	33	24	825
I-II	35	25	900
II-I	35	24	825
II-II	33	22	800
III-I	32	22	750
III-II	33	22	800
IV-I	34	25	825
IV-II	18	16	575
TOTAL	**253**	**180**	**6300**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

English - I

(Common for all Branches)

Subject Code: 13HS1001 **External Marks: 70**
1st year 1st sem **Internal Marks: 30**
3 LH + 1 TH **Credits: 03**

Objectives

- To improve the language proficiency of a technical under-graduate in English with emphasis on LSRW skills.
- To provide learning environment to practice listening, speaking, reading and writing skills.
- To assist the students to carry on the tasks and activities through guided instructions and materials.
- To effectively integrate English language learning with employability skills and training.
- To provide hands-on experience through case-studies, mini-projects, group and individual presentations.
- To expose the students to a variety of self-instructional modes of language learning.
- To develop learner autonomy.

Outcomes

- Students do improve language proficiency in English.
- Students will hone the LSRW skills within and beyond the classroom environment.
- Students can integrate English Language Learning with employability skills.
- Students can inculcate the habit of speaking in English fluently with observation and practice.

Syllabus

Unit – I

Lost Forests by *Johannes V Jensen*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – II

More than 100 million women missing by *Amartya Sen*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – III

Three Days to See – Helen Keller

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – IV

Reaching for the Stars – Kalpana Chawla

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – V

Kalahandi by *Jagannath Prasad Das*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

References:

- Preparing for the Future Ed. D. Ravikumar et al. Maruti Publishers
- My Story by Helen Keller
- Kalpana Chawla: A Life – Padmanabhan, Anil
- Word Power Made Easy – Norman Lewis

ENVIRONMENTAL STUDIES
(Common to all branches.)

External Marks: 70
Subject Code: 13HS1003 **Internal Marks: 30**
I Year I semester **Credits: 3**

Objectives:-

1) Human development and societal development is inevitable. This development is entirely depends on science and Technological advancement through using resource assets of nature. In order to reduce the impacts of the technological development, the environmental studies creating awareness among the engineering graduates. So that we can have a healthy environment Present and future.

2) The course covers the aspects like general awareness, Resources' utilization and conservation, Healthy sustenance of life, pollution control, social aspects, etc. All these areas will provide and habituate the students to- wards conservation and sustainable development.

Outcomes:-

A) The knowledge about environmental studies is applicable as and when required like implementing any developmental activity can over come the hurdles' in relation to environmental aspects.

B) Students can develop eco-friendly technologies for a healthy growth, and development of a nation which can prevent the environmental hazards by appropriate decisions and alternate remedies.

C) Can develop life cycle analysis, give bioremediation methods etc. rather than unsustainable alternatives.

UNIT – I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness. Environmental components – Atmosphere – Hydrosphere – Lithosphere – Biosphere.

Natural Resources: Resources classification – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems on Tribal population & Environment - Mineral resources: Use and exploitation, Tribal & environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture,

fertilizer-pesticide problems, water logging, salinity – concept of sustainable agricultural methods, case studies. – Energy resources: Growing energy needs, non-renewable energy sources - coal, crude oil, natural gas - use of renewable and alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

UNIT – II

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. Food chains, food webs and ecological pyramids. - Energy flow and nutrient flow in the ecosystems - Ecological succession - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Case studies.

UNIT – III

Environmental Pollution: Definition, Cause, effects and control measures of :

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban, Industrial and bio-medical wastes. - Pollution case studies. Role of individual in prevention of pollution - Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

Social Issues and the Environment: Concept of Unsustainable and Sustainable development – Urbanization and Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -World summits on environment. -Wasteland reclamation. -EIA methodologies. – Environment Protection Act. -Air (Prevention and Control of Pollution) Act. –Water (Prevention and

control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation.

UNIT – V

Human Population and the Environment: Population growth, variation among nations. Population problems and control - Environment and human health. Role of information Technology in Environment and human health. – Case Studies.

Field work: Visit to a local area to document environmental assets River/forest/ grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural - Study of common plants, insects, birds. -Study of simple ecosystems pond, river, hill slopes, etc.

Text Books:

1. Bharucha, E. 2005, *Text book of Environmental Studies*, First edition, Universities Press (India) Pvt., Ltd., Hyderabad.

2. Dr. S. Keerthinarayana & Dr. C. Daniel Yesudian. 2004, *Principles of Environmental Science and Engineering*, First edition, Anuradha Publications (P) Ltd., Kumbakonam.

3. P. Anandan & R. Kumaravelan. 2010, *Environmental Science & Engineering*, Sixth reprint, Scitech Publications (India) (P) Ltd., Chennai.

4. Anubha Kaushik & C. P. Kaushik. 2011, *Environmental Studies*, Third edition, New Age International (P) Ltd., New Delhi.

5. Dr. Surinder Deswal & Dr. Anupama Deswal. 2008-09, *A Basic Course in Environmental Studies*, Second revised edition, Dhanpat Rai & Co (P) Ltd., New Delhi.

Reference:

1. Odum, E.P. 1971, *Fundamentals of Ecology*, Third edition, W.B. Saunders & Co (P) Ltd., Philadelphia.

2. P.D. Sharma. 1996, *Ecology and Environment*, Revised edition, Rastogi Publications (P) Ltd.,

3. Cunningham, W.P., Cunningham, M.A., *Principles of Environmental Science*. TMH.

4. Peavy, Rowe and Tchobanoglous, *Environmental Engineering*, Mc Graw – Hill International edition.

5. Dr. Suresh K. Dhameja. 2006-07, *Environmental Studies*, Third revised edition, S.K. Kataria & Sons (P) Ltd., New

Delhi.

6. Graedel, T.E., Allenby, B.R., *Industrial Ecology and Sustainable Engineering*, Pearson Publications.

ENGINEERING MATHEMATICS-I

(Common to All Branches)

Subject Code: 13BS1001 **I Year I semester**
External Marks: 70
Credits: 3 **Internal Marks: 30**

COURSE OBJECTIVES

- To identify & solve the 1st order differential equations and apply in Engineering.
- To understand the process of solving a 2nd and higher order differential equation and solve it. Identify a 2nd and higher order differential equation & solve it in engineering topics.

- Understand the mathematical and physical interpretation of Vector differential operator operating on a vector or scalar point function, the line, surface and volume integrals, vector integral theorems and their applications to find work done, area, and volume.
- To understand the generalized mean value theorems & their use to find the series expansions of functions and in turn their application in finding the maxima and minima of two variable functions.
- Apply the properties of curves in applications of single integral, solve the multiple integrals and to develop the capacity to understand the applications of multiple integrals.

COURSE OUTCOMES

- Able to solve the 1^{st} order differential equations in different fields.
- Identify and solve a 2^{nd} and higher order differential equations and perform simple applications in Engineering.
- Calculate grad, divergence, curl; a line, surface and volume integral. To find work done, area, and volume. Apply the vector integral theorems to evaluate multiple integrals.
- Find the maxima and minima of two variable functions under different constraints.
- Solve the single and multiple integrals and calculate the moment of inertia.

Unit – I

Linear Differential Equations of first order:
Linear differential equations of first order and first degree – exact, linear and Bernoulli.
Applications: Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

Unit-II

Linear Differential Equations of Second and higher order:
Linear differential equations of second and higher order with constant coefficients- Complete solution, Operator D, Rules for finding complementary function, Inverse operator D, Rules for finding particular integral with RHS term of the type e^{ax}, Sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x). Method of variation of parameters.
Applications: LCR circuit, Simple Harmonic motion

Unit-III

Partial Differentiation:
Introduction-Total derivative - Chain rule - Generalized Mean Value theorem for single variable (without proof)-Taylors and Mc Laurent's series for two variables – Functional dependence – Jacobian.
Application: Maxima and Minima of functions of two variables with constraints and without constraints.

Unit-IV

Multiple Integrals:
Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian and Polar Coordinates.
Multiple integrals - double and triple integrals – change of variables – Change of order of Integration-Cartesian and Polar coordinates.
Application: Moment of inertia

Unit-V

Vector Calculus:
Vector Differentiation-Gradient- Divergence- Curl - Laplacian and second order operators- Vector identies.

Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals. Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.
Applications: Work done, Force.

Text Books:

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi.
2. Engineering Mathematics, Volume-I, 11th editions respt., 2012, Dr. T.K.V.Iyengar & others, S. Chand Publishers.

Reference Books:

1. Engineering Mathematics, 4th edition, 2009 - B. V. Ramana, Tata McGraw Hill, New Delhi.
2. A Text Book of Engineering Mathematics – I & II, 2nd edition, 2011, U. M. Swamy & others – Excel Books, New Delhi.
3. Advanced Engineering Mathematics, 8th edition, 2009, Erwin Kreyszig- Shree Maitrey Printech Pvt.Ltd, Noida.

ENGINEERING CHEMISTRY
(*Common to All Branches*)

Code: 13BS1005 **Internal : 30**
I Year I semester **External : 70**
Credits: 3

COURSE OBJECTIVES:

- Acquired sufficient information to ensure that they have an appreciation of polymer science and the typical role of the polymer scientist in today's society.
- Leaned about what is meant by corrosion of metals including different forms of metal degradation and the application of preventative procedures.
- Understand the principles of toxicology, the molecular mechanisms of how chemicals affect human health and the environment, and the resources to identify and assess molecular hazards.
- Novel technology materials are almost prepared from rubber material which is very useful by learning it in this modern civilization.
- Learned about the many scientific, ethical, social and political issues arising from the development of nanotechnology.
- Understand societal impact and managing possible risks of nanotechnology: present and future.
- Understand basic interdisciplinary nature of nanotechnology; (physics, chemistry, electronic and mechanical properties, bio-nanotechnology).
- Evaluate the effectiveness of various types of management practices related to treatment of drinking water and treatment and disposal of related wastewater.
- Describe the current alternative fuels in use today and the science involved in developing alternate fuels.

COURSE OUTCOMES:

- Students will understand the basic language of polymer chemistry, and the synthetic techniques by which polymers can be prepared.
- They will be expected to conceptualize polymer synthetic schemes, to analyze synthesis problems and to create theoretical solutions to the basic challenges of polymer synthesis.
- Students to become better informed about the many scientific, ethical, social and political issues arising from the development of nanotechnology.
- The student should be able to explain the tendency of metals to revert back to their ores in order to attain a lower energy state.

- Can able to explain what is meant by corrosion of metals including different forms of metal degradation and the application of preventative procedures.
- Possess the ability to assess chemical products and processes and design greener alternatives when appropriate.
- Distinguish, classify and summarize automotive systems, functions and their interrelation.
- Student should be able to explain the mode by which potable water is produced through the processes of screening, micro straining, aeration, coagulation and flocculation, sedimentation, flotation, filtration and disinfection;

UNIT-I:

POLYMERS:

Polymerization reactions – Basic concepts, types of polymerisation – addition and condensation polymerisations, plastics – thermosetting and thermoplastics – differences. Compounding and Moulding of plastics – Compression, injection, transfer and extrusion moulding methods. Preparation, properties and engineering uses of the following: PE, PVC, Teflon, Bakelite, Nylon, Polyesters.

BUILDING MATERIALS: Cement – Classification; Portland cement – raw materials, manufacture of Portland cement, chemical constitution of Portland cement, Setting and Hardening of Portland Cement.

UNIT-II:

WATER TECHNOLOGY:

Introduction – Hardness of Water – Temporary and Permanent hardness, Units and inter conversions of Units. Estimation of hardness by EDTA Methods. Problems on Temporary and Permanent hardness. Disadvantages of Hard Water, Methods of Treatment of Water for Domestic Purposes – Sedimentation, Coagulation, Filtration, Disinfection – Sterilization, Chlorination, Break Point chlorination, Ozonisation –Industrial Water Treatment – Desalination, Reverse Osmosis Treatment - Lime-Soda Process, Zeolite Process, Ion-Exchange Process.

UNIT-III:

SCIENCE OF CORROSION:

Definition, examples, Types of corrosion: Theories of corrosion and Mechanism – Dry corrosion (Direct chemical attack), Wet corrosion (Electrochemical theory) Principles of corrosion, Galvanic series, Galvanic corrosion, Concentration cell corrosion, mechanism of wet corrosion – Hydrogen evolution type, oxygen absorption type. Factors influencing corrosion control of corrosion – proper design, use of pure metal and metal alloys, passivity, cathodic protection – Sacrificial anode and impressed current. Modifying the environment, use of inhibitors.

UNIT-IV:

FUEL TECHNOLOGY:

Introduction to Liquid Fuels-Classification of Crude Oil-Fractional Distillation-Cracking (Thermal &Catalytic), Synthetic Petrol (Fischer-Tropschs & Bergius Process) - Polymerization-Refining &Reforming –Knocking –Anti Knocking Agents-Octane & Cetane Number.

LUBRICANTS:

Principle and functions of lubricants – Types of lubrication and mechanism – Thick film or Hydrodynamic lubrication, Thin film lubrication, extreme pressure lubrication. Classification and properties of lubricants – Viscosity, flash and fire points, cloud and pour points, aniline points, neutralization number and mechanical strength.

UNIT-V:

SOLAR ENERGY:

Introduction – harnessing solar energy – photo voltaic cells – Concentrated Solar Power Plants – green house concepts.

GREEN CHEMISTRY:

Introduction-12 principles of green chemistry – green synthesis - Engineering Applications

NANO CHEMISTRY:

Introduction to Nano materials-preparation of few Nano materials (Carbon Nano Tubes, Fullerenes etc)- Top down and Bottom up concepts - Properties of Nano materials- Silver and Gold Nano particles - Engineering & Biomedical applications.

Text Books:

1) "Engineering Chemistry", P.C.Jain and Monica Jain, DhanpatRai Publications, Co., New Delhi 15th Edition.

2) "A Text Book of Engineering Chemistry", S.S. Dara, S.S.Umare, S.Chand& Co., Ltd., 12th Edition.

Reference Books:

1) "A Text Book of Engineering Chemistry" by Dr.Sunita Rattan, S.K. Kataria& Sons (2012).
2) "A Text Book of Engineering Chemistry", by S. Nagarajan, R. Gopalan, D.Venkatappayya, 3rd edition, Vikas Publishing House.
3) "Engineering Chemistry" by Wiley India Editorial Team, Wiley Publishers (2011).
4) "A Text Book of Nano Science and Nano technology", by T. Pradeep, Tata Mc.Graw Hills (2012).

FUNDAMENTALS OF ELECTRICAL ENGINEERING

Internal Marks : 30
Subject code : 13EE1001 **External Marks : 70**
I Year I semester **Credits : 3**

Course Objective:

A fundamental of Electrical Engineering is a basic course for the discipline of EEE. The aim of the course is to teach the basic fundamentals of electrical engineering, so that the students will have to understand the topics related to electrical applications in the later studies.

Outcomes: At the end of this subject the student will be able to understand

1. Basic definitions of electrical engineering.
2. Types of elements.
3. Passive circuit elements V-I relationship.
4. Phase.
5. Capacitors and inductors and their series & parallel operation.
6. Study state response of A.C circuits with different elements
7. Basic definitions of magnetic circuits.
8. Comparison between magnetic and electrical circuit
9. Electrical wiring accessories.
10. Different types of main switches.
11. Electrical wiring system

UNIT-I

Introduction to Electrical Circuits

Circuit concepts –Resistor(R)-Inductor(L)-Capacitor(C)-Voltage and Current Sources (Ideal and Non-Ideal)- Independent and Dependent Sources-Source transformation-Voltage - Current relationship for passive bilateral elements (for different input signals-square, ramp, saw tooth, triangular)-Ohm's law, Kirchoff's laws

UNIT-II

Single Phase A.C Circuits

R.M.S,Average values and form factor for different periodic wave forms – sinusoidal alternating quantities – Phase and Phase difference – Complex and polar forms of representations, J-notation,Concept of Reactance, Impedance, Susceptance and Admittance-Power Factor and significance-Real and Reactive power, Complex Power. Steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation.

UNIT-III

Magnetic circuits: Basic definitions of magnetic flux, flux density, Reluctance, Magneto motive force (m.m.f), magnetic field intensity, magnetic permeability and susceptibility. Comparison between magnetic and electrical circuits, inductively coupled circuits – coefficient of coupling – dot convention – multi – winding coupled circuit – analysis of coupled circuit.

-composite magnetic circuit-analysis of series and parallel magnetic circuits, simple problems on magnetic circuits.

UNIT-IV

Measuring instruments

Basic Principle of indicating instruments, types of instruments, operation of permanent magnet moving coil and moving iron instruments.

UNIT-V

Electrical Wiring: Electrical Wiring accessories switches, ceiling roses, lamp holders and adopters, sockets, plug, fuses. Study different types of main switches (DP mains, ICDP, ICTP) and MCB's. Basics in wiring system, estimation of cost selection of interior wiring system suitable to a given building - number of circuits. Drawing wiring layout for a living room.

Text Books:

1. Electrical Circuits by A. Sudhakar and Shyammohan S Palli, Tata McGraw- Hill.
2. Engineering network analysis and filter design by Gopal G. Bhise, Umesh Publications.
3 . Electrical Wiring, Estimating & costing by S.L.Uppal.
4. Basic Electrical Engineering, K.B. Madhusahu, Scitech Publications.

Reference Books:

1. Principles of Electrical and Electronics Engineering, V.K Mehata S.Chand, second edition.
2. Electrical wiring by Arora
3. Electrical Drawing by Balbir Singh.

B. Tech (Mechanical Engineering)
Engineering Mechanics
(Common for Civil,EEE,ECE,CSE&IT branches)

I Year I semester **Credits: 3**
Subject Code: 13ME1003 **Internal Marks: 30**
External Marks: 70

Objectives:

- To provide knowledge on system of forces, free body diagram.
- To provide knowledge on friction between two matting surfaces.
- To provide knowledge on centre of gravity and moment of inertia for different sections.

Outcomes:

- Able to know system of forces, free body diagram
- Able to know the friction between two matting surfaces
- Able to calculate centre of gravity and moment of inertia for different sections.

UNIT I

SYSTEMS OF FORCES: Introduction – parallelogram law – Forces and components - Resultant of coplanar concurrent forces – component forces - vector notation – moment of force – principle of moments – couples - Resultant of planar force systems.

UNIT II

EQUILIBRIUM OF FORCE SYSTEMS : Equilibrium – free body diagrams – Equations of equilibrium – equilibrium of planar systems – graphical methods and analytical methods for equilibrium of planar systems – Moment of a Force and its applications, Varignon's theorem

UNIT III

FRICTION: Introduction, limiting friction – types of friction and friction laws – application of friction - Inclined plane, friction of screw and nuts – screw jack.

CENTROIDS AND CENTER OF GRAVITY: Centre of gravity – centroids of area and lines – determination of centroids by integration – centroids of composite figures – theorems of Pappus.

UNIT IV

AREA MOMENT OF INERTIA : Moment of inertia – polar moment of Inertia – Radius of gyration - Transfer theorem for moment of Inertia – Moment of inertia of composite areas – product of inertia – Transfer formula for product of Inertia.

MASS MOMENT OF INERTIA : Moment of inertia of masses –Radius of gyration – Transfer formula for mass moment of inertia – Mass moment of Inertia by Integration**.**

UNIT V

KINEMATICS : Rectilinear motion-curvilinear motion – Rectangular components of curvilinear motion - Normal and Tangential components of acceleration, Radial and transverse components - Kinematics of rigid bodies - angular motion – fixed axis rotation – Definition and analysis of plane motion.

KINETICS: Kinetics of rigid bodies – equation of planes motion – fixed axis rotation – rolling bodies (simple examples) - general plane motion (Simple examples).

Text Books:

1. I.B. Prasad: Applied Mechanics, Khanna Publishers, 19th Edition, 2009.
2. Ferdinand L. Singer: Engineering Mechanics, Harper Collins Publishers India, 3rd Edition, 2008.
3. A.K. Tayal: Engineering Mechanics, Umesh Publishers, 13th Edition, 2008.

References :

1. Irving. H. Shames: Engineering Mechanics, PHI Publishers, 4th Edition, 2008.
2. Timoshenko & Young: Engineering Mechanics, MGH Publishers, 4th Edition, 2010.
3. K.L. Kumar, Engineering Mechanics, TMH Publishers, 3rd Edition, 2009.
4. Engineering Mechanics by S. Timoshenko and D.H.Young, McGraw-Hill.
5. Engg. Mechanics / S.S. Bhavikati & J.G. Rajasekharappa.

ENGINEERING CHEMISTRY LAB

(*Common to All Branches*)

Code: 13BS1102 **Credits: 2**

I Year I semester **Internals: 25;**

Externals: 50

COURSE OBJECTIVES:

The students completing this course are expected to understand:

- Determination of hardness, D.O., Turbidity of water.
- Determination of viscosity, flash point and acid value of oil.
- Determination of concentration of a solution pH metrically and conductometrically.
- Synthesis of polymers and preparation of compounds.

COURSE OUTCOMES:

The students are expected to:

- Understand the importance of viscosity of a lubricant.
- Be able to select a lubricant for a particular type of a machine.
- Analyze the importance of temperature for viscosity.
- Know the impurities with hardness experiment.
- Correlate the purity of water by doing D.O., Turbidity experiments.
- Suggest the composition of water to be fed to boilers and households.
- Know to maintain different reaction conditions to get maximum yield.

LIST OF EXPERIMENTS : (Any Twelve experiments have to be completed)

1) Determine the Acid Value present in the given lubricating oil.
2) Determine the Flash and Fire points of given Oil Sample.
3) Determine the Kinematic Viscosity of a given oil sample by using Viscometer.
4) Estimate the amount of Dissolved Oxygen present in the given water sample by Modern Winkler's Method.
5) Determine the Total Hardness present in the given water sample by using EDTA Method.
6) Estimate the amount of Turbidity present in the given water sample by using Turbidity meter.
7) Estimate the Viscosity of an Organic Solvent by using Ostwald Viscometer.
8) Prepare Phenol-Formaldehyde Resin and calculate its weight.
9) pH metric Titrations between Strong acid and Strong base.
10) pH metric Titrations between Strong acid and Weak base.
11) Conductometric Titrations between Strong acid and strong base.
12) Conductometric Titrations between Strong acid and Weak base.
13) Colorimetric estimation of Iron (III).
14) Estimate the amount of Calcium present in given cement sample.

TEXT BOOKS:

1) Practical Engineering Chemistry by K.Mukkanti, etal. B.S.Publications, Hyderabad (2011)

2) "Lab Manual on Engineering Chemistry" by Dr.Sudharani, DhanpatRai Publications, Co., New Delhi. (2010)

REFERENCE BOOKS:

1) Engineering Chemistry Lab Manual: SCITECH, ShuchiTiwari (2010)
2) "Vogel Text Book of Quantitative Chemical Analysis", 6th Edition by G.J.Jeffery, J.Bassett, J.Mendham, R.C. Denney, Longman Scientific & Technical Publications, Newyork.
3) "A Text Book of Engineering Chemistry" by R.N.Goyal and HarmendraGoel, Ane Books, India.
4) "A Text Book on experiments and calculations Engineering, S.S. Dara", S.Chand& Co., Ltd., (2003)
5) Instrumental methods of Chemical Analysis, Chatwal, Anand, 5th Edition, Himalaya Publications.

BASIC ELECTRICAL ENGINEERING LAB

Internal Marks : 25

Subject code : 13EE1101 **External Marks : 50**

I Year I semester **Credits: 2**

Objective: To introduce the student to study different electrical components and to verify the basic laws related to electrical engineering, electrical wiring system through study, practice, and experiments.

Outcomes: At the end of this lab the student will be able to

1. Understand various types of electrical components.
2. Understand various basic laws related to electrical engineering.
3. Understand electrical wiring system.
4. Understand control of lamps.
5. Understand soldering and bread board precautions.

LIST OF EXPERIMENTS

1. Study of electrical components.
2. To verify ohm's law
   To verify (a) Kirchoff's current law
   (b) Kirchoff's voltage law
3. To verify the total resistance of the series and parallel connected circuits.
4. To find voltage current relationship for series RL circuit and determine power factor.
5. Determination of peak and average voltage in A.C circuit.
6. Find armature resistance, field resistance and filament lamp resistance using V-I method.
7. Fluorescent tube connection.
8. (a) One way control of lamp
   (b) Two way control of lamp
9. Fan wiring.
10. Living room wiring.

Additional Experiments:

11. Soldering and bread board precautions.

12. Parameters of a choke coil.

INFORMATION TECHNOLOGY WORKSHOP LAB

(Common to All Branches)

Credits : 2 **External Marks : 50**

Subject Code: 13CS1103 **Internal Marks : 25**

I Year I Semester

Course Objectives:

The IT Workshop for engineers is a 6 training lab course spread over 60 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools.

Course Outcomes:

- Students gain knowledge on computer system such as system unit, input devices, output devices connected to the computer.
- Students gain knowledge to understand the booting process that includes switching on the system, execution of POST routine, then bootstrap loader, and loading of the operating system, and getting it ready for use.
- Students gain knowledge to understand the working of the internet that include the use of protocols, domains, IP addresses, URLs, web browsers, web servers, mail-servers, etc.
- Students get familiarize with parts of Word window, To create and save a document, To set page settings, create headers and footers, To use various formatting features such as bold face, italicize, underline, subscript, superscript, line spacing, etc.
- Students get familiarize with parts of Excel window, To create and save a workbook with single and/or multiple worksheets, To apply operations on range of cells using built-in formulae, etc.

- Students get familiarize with parts of PowerPoint win, to create and save a new presentation, apply design templates to a presentation, to insert, edit and delete a slide , etc.
- Students gain knowledge on search information using search engines etc.

PC Hardware

Week 1 – Task 1 : Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 2 – Task 2 : Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 3 – Task 3 : Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva. Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards

Week 4 – Task 4 : Hardware Troubleshooting : Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Software Troubleshooting : Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Week 5 - Task 1 : Orientation & Connectivity Boot Camp : Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2 : Web Browsers, Surfing the Web : Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Week 6 - Task 3 : Search Engines & Netiquette : Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

Task 4 : Cyber Hygiene : Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Word

Week 7 – Word Orientation : The mentor needs to give an overview of Microsoft/ equivalent (FOSS) tool word : Importance of MS/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.
Task 1 : Using word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both Word.

Week 8 - Task 2 : Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes.

Task 3 : Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

Week 9 - Task 4 : Creating a Feedback form - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word.

Excel

Week 10 - Excel Orientation : The mentor needs to tell the importance of MS/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources
Task 1 : Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Week 11 - Task 2 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP / VLOOKUP

Task 3 : Performance Analysis - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

Week 12 - Task 4 : Cricket Score Card - Features to be covered:-Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation

MS/equivalent (FOSS) tool Power Point

Week 13 - Task1 : Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power-point.

Week 14 - Task 2 : Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts, Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

Week 15 - Task 3 : Entire week concentrates on presentation part of power point. Topic covered during this week includes -Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing.

Publisher

Week 16 : Help students in preparing their personal website using Microsoft/ equivalent (FOSS) tool publisher. Topic covered during this week includes - Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

TEXT BOOKS:

1. “Comdex Information Technology course tool kit” : Vikas Gupta, WILEY Dreamtech

2. “The Complete Computer upgrade and repair book”, 3rd edition Cheryl A Schmidt, WILEY Dreamtech

3. “Introduction to Information Technology”, ITL Education Solutions limited, Pearson Education.

4. “PC Hardware and A+ Handbook” – Kate J. Chase PHI (Microsoft)

5. All others related material is available at

(a) www.sssolutions.in

(b) www.sontisoftsolutions.org

English – II

(Common for all Branches)

Subject Code: 13HS1002 **External Marks: 70**
I Year II semester **Internal Marks: 30**
3 LH + 1 TH **Credits: 02**

Objectives

- To improve the language proficiency of a technical under-graduate in English with emphasis on LSRW skills.
- To provide learning environment to practice listening, speaking, reading and writing skills.
- To assist the students to carry on the tasks and activities through guided instructions and materials.
- To effectively integrate English language learning with employability skills and training.
- To provide hands-on experience through case-studies, mini-projects, group and individual presentations.
- To expose the students to a variety of self-instructional modes of language learning.
- To develop learner autonomy.

Outcomes

- Students do improve language proficiency in English.
- Students will hone the LSRW skills within and beyond the classroom environment.
- Students can integrate English Language Learning with employability skills.
- Students can inculcate the habit of speaking in English fluently with observation and practice.

Syllabus

Unit – I

Globalization by *Joseph Stiglitz*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – II

My Early Days by *Dr. A. P. J. Abdul Kalam*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – III

I have a Dream by *Martin Luther King*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – IV

The Cop and the Anthem by O. Henry

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

Unit – V

Telephone Conversation by *Wole Soyinka*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

References:

- Preparing for the Future Ed. D. Ravikumar et al. Maruti Publishers
- Wings of Fire – APJ Abdul Kalam
- Short Stories – O. Henry

- 30 days to a more Powerful Vocabulary by Norman Lewis and Wilfred Funk.

COMPUTER PROGRAMMING

(Common to All Branches)

Subject Code : 13CS1001 **External Marks : 70**

I Year II semester **Internal Marks : 30**

Credits : 3

COURSE OBJECTIVES

- To impart adequate knowledge on the need of programming languages and problem solving techniques.
- To develop programming skills using the fundamentals and basics of C Language.
- To enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.
- To teach the issues in file organization and the usage of file systems.
- To impart the knowledge about pointers which is the backbone of effective memory handling
- To study the advantages of user defined data type which provides flexibility for application development
- To teach the basics of preprocessors available with C compiler.

COURSE OUTCOMES

- To obtain the knowledge about the number systems this will be very useful for bitwise operations.
- To develop programs using the basic elements like control statements, Arrays and Strings .
- To solve the memory access problems by using pointers
- To understand about the dynamic memory allocation using pointers which is essential for utilizing memory
- To understand about the code reusability with the help of user defined functions.
- To develop advanced applications using enumerated data types, function pointers and nested structures.
- To learn the basics of file handling mechanism that is essential for understanding the concepts in database management systems.
- To implement the concepts in data structure like linked lists.
- To understand the uses of preprocessors and various header file directives.

UNIT I:

Problem Solving: *Definition of a Problem, A Framework for Problem Solving, Classification of Problems, Algorithms / Pseudo code- Definition, Properties, Flowchart- Introduction, Introduction to RAPTOR Tool, Flowchart examples for simple computational problems, Program Development Steps, Computer Languages- Machine, Symbolic and High-level, Creating and Running Programs: writing, editing, compiling, linking and executing.*

C Fundamentals, Character set, C tokens (Identifier and Keywords, Data types, Constants, variables), Declarations, Expressions, Statements

C Operators: Arithmetic, Unary, Relational and Logical, Assignment and Conditional Operators, Library Functions. Bit Operations and Boolean Logic

UNIT II:

CONTROL STRUCTURES: if statement, if…else statement-various forms of if, nested if.

ITERATIVE LOOPS: while, do-while and for statements, initialization and updating, event and counter controlled loops, looping applications, break statement, continue statement, goto statement, switch statement, nested switch statement, comma statement.

UNIT III:

FUNCTIONS – MODULAR PROGRAMMING: Functions, basics, parameter passing, Storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, Recursive solutions, header files, example c programs. Passing 1-D arrays, 2-D arrays to functions, parameter passing mechanisms (passing by value), storage classes (auto, register, extern, static), scope of variable

ARRAYS: Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings concepts, String handling functions and string manipulations, 1-D arrays, 2-D arrays and character arrays, Multidimensional arrays , Array applications: Matrix Operations

UNIT IV:

POINTERS: Pointer definition, pointers concepts, initialization of pointer variables, pointers and function arguments, passing by address, dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

ENUMERATED, STRUCTURE AND UNION TYPES: Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.

UNIT V:

FILE HANDLING: Input and output – concept of a file, Creating, processing, opening and closing – Bitwise Operations, text files and binary files, Formatted I/o, file I/o operations, example programs. C pre-processor

Text Books:

1. "The C – Programming Language", B.W. Kernighan, Dennis M. Ritchie, PHI
2. "Let Us C", Yashwant Kanitker, Second Edition

Reference Books:

1. "C and data structures: A Snap Shot Oriented Treatise Using Live Engineering Examples" by Dr. N.B. Venkateswarlu, S Changd & Co, New Delhi.

2."C Programming: A Problem- Solving Approach", Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.

3. "Programming in C", Stephen G. Kochan, 3/e Pearson, 2007

4. Web-link http://raptor.martincarlisle.com/

ENGINEERING MATHEMATICS – II

(Common to all branches)

Subject Code: 13BS1002 **I Year II semester**

External Marks: 70

Internal Marks: 30

Credits: 3

COURSE OBJECTIVES

- Identify, formulate, and solve the algebraic and transcendental equations. Solve the problems under curve fitting.
- To identify and solve Laplace and Inverse Laplace transforms of different functions, apply the knowledge of its properties in Engineering.
- Approximate an unknown function y = f(x) tabulated at evenly or unevenly spaced points by a polynomial. Develop the capacity to find the numerical solution of an ordinary differential equation and evaluate definite integrals.
- Solve linear and non-linear 1^{st} order partial differential equations. Solve the wave, heat and Laplace equations by the method of separation of variables.

COURSE OUTCOMES

- Solve the algebraic and transcendental equations by different numerical methods. Approximate a linear and non-linear equation to the given data by the method of least squares.
- Apply the knowledge of Laplace transforms formulae in solving ordinary differential equations & also in engineering field.
- Find an unknown function y = f(x) for an evenly or unevenly spaced points by a polynomial. Find the numerical solution of an ordinary differential equation and evaluate definite integrals
- Solve a linear and non-linear 1^{st} order partial differential equation. Solve a linear second and higher order partial differential equation by the method of separation of variables and apply it to solve the wave, heat and Laplace equations.

Unit – I

Algebraic and Transcendental Equations and Curve fitting:

Solution of Algebraic and Transcendental Equations- Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

Unit-II

Interpolation and Numerical Differentiation and Integration:

Interpolation- Introduction – Finite differences- Forward Differences – Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial – Newton's formulae for interpolation – Interpolation with unevenly spaced points – Lagrange's Interpolation formula.

Numerical Differentiation and Integration – Differentiation using finite differences – Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule.

Unit-III

Numerical solution of Ordinary Differential equations:

Solution by Taylor's series – Picard's Method of successive Approximations – Euler's and Modified Euler's Method – Runge – Kutta Methods – Predictor – Corrector Methods – Milne's Method.

Unit-IV

Laplace and Inverse Laplace transforms:
Laplace transforms of standard functions – Shifting Theorems, Transforms of derivatives and integrals – Unit step function – Dirac's delta function – Inverse Laplace transforms – Convolution theorem.
Application: Solution of ordinary differential equations using Laplace transforms.

Unit-V

Partial Differential equations:
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and non-linear (standard type) equations. Solution of linear Partial differential equations with constant coefficients – Method of Separation of Variables.
Applications: One dimensional Wave and Heat equations.

Text Books:

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi.
2. Ravindranath, V. and Vijayalaxmi, A., 2nd edition, 2012, A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

Reference Books:

1. Mathematical Methods, 6th edition, 2011, Dr. T. K.V.Iyengar & others S. Chand Publications.
2. Engineering Mathematics, 4th edition, 2009 - B. V. Ramana, Tata McGraw Hill, New Delhi.
3. Engineering Mathematics Volume-II, 6th edition, 2012, T.K.V Iyengar, &others, S.Chand Co. New Delhi.

ENGINEERING MATHEMATICS – III

(Common to All Branches)

Subject Code: 13BS1003 **I Year II semester**

External Marks: 70
Internal Marks: 30
Credits: 3

COURSE OBJECTIVES

- Calculate the rank of a matrix, solve linear system of equations by different methods and apply the knowledge to find the current in an electric circuit.
- Understand the concept of eigen values, eigen vectors, Cayley's Hamilton theorem and its applications. Also to acquire the knowledge of reduction of quadratic to canonical form and its applications.
- Acquire the knowledge of Fourier & Inverse Fourier transforms, their properties, and solving problems.

- Perform the Fourier series expansion of different functions in different intervals. Also to acquire the knowledge of half range series.
- Acquire the knowledge of z- transforms and inverse z-transforms, their properties and their applications to solve difference equations.
- Study the Beta and Gamma functions, their properties and their applications to solve improper integrals.

COURSE OUTCOMES

- Calculate the rank of a matrix, solve a linear system of equations and apply the knowledge in the engineering field.
- Calculate the eigen values, eigen vectors, use Cayley's Hamilton theorem to calculate inverse and powers of a matrix. Reduce a quadratic form to canonical form and find its nature.
- Calculate the z- transforms and inverse z-transforms of different functions and to solve the difference equations.
- Apply Beta and Gamma functions to solve improper integrals.
- Find the Fourier series and half range series expansion of different functions in different intervals.
- Find the Fourier & inverse Fourier transforms of different functions and apply this knowledge in solving different engineering problems.

UNIT – I

Matrices:

Rank of Matrix- Echelon form, Normal form – Solution of Linear System of equations – Direct methods, Gauss elimination, Gauss Jordan and Gauss Seidal Methods.

Application: Finding the current in a electric circuit.

UNIT – II

Eigen values , Eigen vectors & Quadratic forms :

Eigen values - Eigen vectors – Properties – Cayley -Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

Applications: Free vibration of a two mass system.

UNIT – III

Fourier series and Fourier Transforms:

Fourier series- Determination of Fourier coefficients (without proof) – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series.

Fourier integral theorem (only statement) – Fourier sine and cosine integrals - Fourier transform – sine and cosine transforms – properties – inverse Fourier transforms – Finite Fourier transforms.

UNIT – IV

Z- Transforms:

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems -Inverse z-transform – Partial fractions, Convolution theorem.

Application: Solution of Difference equations by Z-transforms.

UNIT – V

Special functions:
Gamma and Beta Functions – Properties - Relation between Beta and Gamma functions- Evaluation of improper integrals.
Application: Evaluation of integrals.

Text Books:

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics Volume - II, 6th editions respt., 2012, T.K.V Iyengar, & others, S.Chand Co. New Delhi.

Reference Books:

1. Mathematical Methods, 4th edition, 2009, B.V Ramana, Tata McGraw Hill, New Delhi.
2. Ravindranath, V. and Vijayalaxmi, A., 2nd edition, 2012, A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.
3. Dean G. Duffy, Advanced engineering mathematics with MatLab, CRC Press.
4. Advanced Engineering Mathematics, 8th edition, 2009, Erwin Kreyszig- Shree Maitrey Printech Pvt.Ltd, Noida.

ENGINEEIRNG PHYSICS SYLLABUS

(Common to all Branches)

Subject Code : 13BS1004 **External Marks:70**

I Year II semester **Internal Marks :30**

Credits : 3

UNIT- I : WAVE OPTICS

Interference

Introduction, Principle of Superposition of Waves, Coherence –Young's Double Slit Experiment – Intensity Distribution and Fringe Width, Interference in Plane Parallel Film due to Reflected Light, Newton's Rings under Reflected Light - Determination of Wavelength of Monochromatic Source of Light.

Diffraction

Introduction, Types of Diffraction [Fresnel & Fraunhofer], Fraunhofer Diffraction due to Single Slit – Intensity Distribution Differences between Interference and Diffraction,

UNIT-II : LASERS & FIBER OPTICS

Lasers

Introduction, Characteristics of Lasers- Coherence, Directionality, Monochromacity and High Intensity, Principle of Laser – Absorption, Spontaneous and Stimulated Emission; Einsteins's Coefficients, Population Inversion, Optical Resonator and Lasing Action, Ruby Laser, Helium-Neon Laser, Applications of Lasers in Industry, Scientific and Medical Fields.

Fiber Optics

Introduction, Principle of Optical Fiber – Total Internal Reflection, Conditions for Light to Propagate - Numerical Aperture and Acceptance Angle, Optical Fiber Construction, Types of Optical Fibers – Step Index Fibers and Graded Index Fibers, Differences between Step Index Fibers and Graded Index Fibers, Differences between Single Mode Fibers and Multimode Fibers, Advantages of Optical Fibers in Communications.

UNIT-III : INTRODUCTORY SOLID STATE PHYSICS

Crystal Structure

Introduction, Basic Terms – Lattice, Basis, Crystal Structure, Coordination Number, Atomic Radius, Packing Fraction, Free Volume, Lattice Parameters, Unit Cell and Primitive Cell, Crystal Systems and Bravais Lattices, Structure and Packing Fractions of Simple Cubic, Body Centered Cubic and Face Centered Cubic Crystal Structures.

X-Ray Diffraction

Crystal Planes, Directions and Miller Indices, Distance of Separation between successive hkl Planes – Inter Planar Spacing, Diffraction of X-Rays by Crystal Planes – Bragg's Law;

UNIT-IV: FREE ELECTRON THEORY & PRELIMINARY QUANTUM MECHANICS

Free Electron Theory

Introduction, Classical Free Electron Theory, Mean free path, Relaxation time, Drift velocity, Mobility, Current Density and Electrical Conductivity,

Preliminary Quantum Mechanics

Introduction, Waves and Particles, Wave Particle Duality and De-Broglie Hypothesis, Experimental Verification – G. P. Thomson Experiment, Time independent Schrödinger wave equation, Physical Significance of Wave Function, Particle in One Dimensional Potential Box.

UNIT-V : ESSENTIALS OF MATERIAL SCIENCE

Magnetic Properties

Introduction, Basic Terms – Magnetic Flux (ϕ), Magnetic Flux Density or Magnetic Field Induction (B), Magnetic Field Intensity or Magnetic Field Strength (H), Intensity of Magnetization (I), Permeabilty (μ) & Relative Permeability (μ_r) and Susceptibility (χ), Relation between B, H & I, Relation between Relative Permeability and Susceptibility, Origin of Magnetic Moment – Bohr Magneton, Classification of Magnetic Materials – Dia, Para and Ferro, Domain Theory of Ferromagnetism – Hysteresis Curve; Soft and Hard Magnetic Materials.

Dielectric Properties

Introduction, Basic Terms – Electric Field (E), Electric Dipole, Electric Dipole Moment (μ_e), Polarizability (α), Polarization Vector (P), Displacement Vector (D), Permittivity (ε) and Relative Permittivity or Dielectric Constant (ε_r), and Electric Susceptibility (χ_e), Relation between D, E & P, Relation between Relative Permittivity and Susceptibility, Electronic Polarizability, Ionic Polarizability, Orienational Polarizability and Total Polarizability, Definitions of Ferro Electricity and Piezoelectricity.

Text Books:

1. Engineering Physics by Mani Naidu, Pearson Publications Chennai

2. A Text Book of Engineering Physics by Ksheera Sager and Avadhanulu

3. Engineering Physics by Gaur and Gupta

References

1. University Physics by Young and Freedman 12th Edition.

2. Fundamental of Physics by Resnick, Halliday and Walker

Engineering Drawing
(Common to all Branches)

Subject Code: 13ME1001 **Credits: 3**
I Year II semester **Internal Marks: 30**
External Marks: 70

Course Objectives
- Able to develop drawing skills and representation of I angle and III angle projection, isometric Projection, Isometric drawing.

Course Outcomes
- An ability to apply knowledge of engineering drawing principles in other subjects in Mechanical Engineering and other Engineering disciplines.
- Should be able to understand the Machine & Component drawing skill in other semesters.

UNIT I
Lettering and Dimensioning: Introduction to various terms; instruments IS 9609 provision, lettering practice. Elements of dimensioning and systems of dimensioning.

Construction of scales: Plain Scale, Diagonal & Vernier Scales.

Geometric Constructions and Engineering Curves: Construction of Polygons, Construction of Conic sections–parabola, ellipse and hyperbola using General Method, construction of ellipse using oblong, arc's of circles and concentric circles methods.

UNIT II
Orthographic Projections: First and Third Angle Projections:
Projections of Points. Projections of Straight Lines inclined to one reference plane.

UNIT III

Projections of planes - Perpendicular planes & planes inclined to one reference plane and both reference planes.

UNIT IV

Projections of solids: Classification of solids. Projections of Prism, Cylinder, Pyramid & Cone inclined to one reference plane.

UNIT V

Conversion of Orthographic Projections to Isometric Projections: Conversion of Orthographic View to Isometric views

Conversion of Isometric Projection to Orthographic Projections: Conversion of Isometric view to Orthographic views

Text Books

1. Engineering Drawing, by N. D. Bhat & V. M Panchall, Charotar Publishing House.
2. Engineering Drawing, by K.L.Narayana & P.Kanniah

Reference Books

1. K. Venugopal, Engineering Drawing and Graphics, 2nd Ed. New Age International.
2. Luzadder, Warren, J. and Jon. D. M., "Fundamentals of Engineering Drawing", 11th Edition, Prentice Hall India.

Basic English Language Communication Skills Laboratory

(Common for all Branches)

Subject Code: 13HS1101 **External Marks: 50**
I Year II semester **Internal Marks: 25**
3 PH **Credits: 02**

Objectives

- To improve the communication skills through Listening & Practicing the structures of language.
- To make the students to adopt themselves to the situations and converse using their spontaneity.
- To make the students acquiring the language proficiency.
- To provide the real life situations to emulate the language properly.
- To make them realize the importance of Stress, Intonation and Rhythm of language.
- To make the students to improve pronunciation, vocabulary, language skills, communication skills, body language and grammar to fulfill the demands of the employer.

Outcomes

- Students will be able to master Technical and Communicative English Language skills.
- Students will be in LSRW skills, both Verbal (Oral & Written) & Non- verbal communication.
- Students will emulate the language properly in their real life situations.
- Students will acquire all the requisite skills such as pronunciation, vocabulary and communication.

List of Sessions

Unit – I: Introduction to Phonetics, Sentences and its applications and listening skills.
Unit – II: Consonant Sounds, Parts of Speech & Speaking skills.
Unit – III: Vowel Sounds, Tenses & Writing skills.
Unit – IV: Syllable & Stress, voice & Writing skills.
Unit – V: Rhythm & Intonation, Reported Speech & Situational Dialogues.
Text Books:

- "Speak Well" by K. Nirupa Rani, Jayashree Mohan Raj, B. Indira, Orient Blackswan, Hyderabad (2012)
- "Strengthen your Steps" by Dr. M. Hari Prasad, Dr. John Varghese, Dr. R. Kishore Kumar, Maruthi Publications, Hyderabad (2010)

References:

- A Text Book of English Phonetics: For Indian Students by T. Balasubramanian, Macmillan Publishers India (2000)
- Better English pronunciation by J.D. O'Connor, Cambridge Unviersity Press, 23-Oct- 1980.
- Practical English Usage by Michael Swan.

COMPUTER PROGRAMMING LAB
(Common to All Branches)

Subject Code: 13CS1101 **External Marks : 50**
I Year II semester **Internal Marks : 25**
Credits: 2

COURSE OBJECTIVES

- To provide the student with the necessary skills to write and debug programs using the C programming language
- To provide coverage of basic structure of c programming language
- To provide an understanding of the major modules of c programming language

COURSE OUTCOMES

On successful completion of this module, students should be able to:

- how to write , save, debug and execute programs in c
- when and how to use the appropriate statements available in the C language
- explain the principles of structured program design
- describe what is meant by a well designed program
- describe when and how to use the standard C statements
- Write basic C programs using
    - Selection statements, Repetitive statements, Functions,
    - Pointers, Arrays, Strings

Exercise 1

a) Write C programs for calculating • Temperature conversions • Income tax • Area of triangle

a) Write a C program that reads an integer 'n' and rotate 'n' bit positions
b) Write a C program to swap contents of two variables without using third variable.

Exercise 2

a) Write a C program to find the student's grade for given marks.
b) Write a C program to find the greatest of 3 given numbers.
c) Write a C program which takes two integer operands and one operator from the user, perform the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Exercise 3

a) Write a C program to find the sum of individual digits of a positive integer.

b) Write a C program to generate the first 'n' terms of the Fibonacci sequence.

c) Write a C program to generate all the prime numbers between 1 and 'n'.

d) Write a C program to find the reverse a given number.

Exercise 4

a) Write a C program for Addition and multiplication of two Matrices.

b) Write a C program to find the transpose of a matrix in in-place manner.

Exercise 5

Write a C program that uses functions to perform the following operations:

a) To insert a sub-string in to given main string from a given position.

b) To delete n Characters from a given position in a given string.

c) Simple programming examples to manipulate strings.

d) Verifying a string for its palindrome property

Exercise 6

Write C programs that use both recursive and non-recursive functions for the following

a) To find the factorial of a given integer.

b) To find the GCD (greatest common divisor) of two given integers.

Exercise 7

a) Write a C functions to find both the largest and smallest number of an array of integers.

b) Write a C function that uses functions to perform the following:

i) that displays the position/ index in the string S where the string T begins, or –1 if S doesn't contain T.

ii) to count the lines, words and characters in a given text.

Exercise 8

a) Write a C function to generate Pascal's triangle.

b) Write a C function to construct a pyramid of numbers.

c) Write a C function to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$

Exercise 9

a) Write a C program Pointer based function to exchange value of two integers using passing by address.
b) Write a C program which explains the use of dynamic arrays.
c) Write a C program to enlighten dangling memory problem (Creating a 2-D array dynamically using pointer to pointers approach.

Exercise 10

Write a C programs for Examples which explores the use of structures, union and other user defined variables

Exercise 11

Write a C program that uses functions to perform the following operations using Structure:

a) Reading a complex number b) Writing a complex number

c) Addition of two complex numbers d) Multiplication of two complex numbers

Exercise 12

a) Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line)

Reference Books:

1. C and data structures – Dr. N.B Venkateswarlu, B.S. Publications.
2. C Programming: A Problem - Solving Approach, Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.
3. Programming in C, Stephen G. Kochan, 3/e Pearson, 2007
4. The C – Programming Language' B.W. Kernighan, Dennis M. Ritchie, PHI

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Engineering Workshop
(Common to all Branches)

Subject Code: 13ME1101 **Credits: 2**
I Year II semester **Internal Marks: 25**
External Marks: 50

Course Objectives

- The Engineering Workshop Practice for engineers is a training lab course spread over entire year. The modules include training on different trades like Fitting, Carpentry, Black smithy etc… which makes the students to learn how various joints are made using wood and other metal pieces.

Course Outcomes

- Student will be able to make various joints in the given object with the available work material.
- Student will be able to know how much time a joint will take for the assessment of time

I. Wood Working Technology - Familiarity with different types of woods used and tools used in wood Working technology.

Tasks to be performed:

1) To make Half – Lap joint 2) To make Mortise and Tenon joint
3) To make Corner Dovetail joint 4) To make Briddle joint.

II. Sheet Metal Working – Familiarity with different types of tools used in sheet metal working, developments of sheet metal jobs from GI sheets, knowledge of basic concepts of soldering.

Tasks to be performed:

1) To make Square Tray 2) To make Taper side Tray
3) To make Conical Funnel 4) To make Elbow Pipe.

III. Forging Technology – Familiarity with different types of tools used in forging technology. Knowledge of different types of furnaces like coal fired, electrical furnaces etc...

Tasks to be performed:

1) To make round M.S rod to square bar 2) To make L bend in given M.S. Rod.
3) To make S bend in given M.S. Rod. 4) To perform heat treatment tests like annealing, normalizing etc...

IV. Fitting Technology – Familiarity with different types of tools used in fitting technology.

Tasks to be performed:

1) To make "V" – fitting 2) To make square fitting
3) To make Dovetail fitting 4) To make Straight fitting

V.HOUSE WIRING

1) Tube light connection
2) Staircase connection

Note: **Any two jobs from each trade must be performed by the student.**

ENGINEEING PHYSICS LAB

Subject Code : 13BS1101 **External Marks:50**

I Year II semester **Internal marks :25**

Credits : 2

COURSE DESCRIPTION

This Laboratory course is intended to apply the Scientific Method to expedite experiments that include

- **Mechanics**
- **Wave Fundamentals**
- **Physical/Wave Optics**
- **Modern Physics**
- **Solid State Devices**
- **Electromagnetic Induction**

so that student can verify theoretical ideas and concepts covered in lecture through host of Analytical Techniques, Statistical Analysis and Graphical Analysis

SCOPE

This course is offered for all First Year B.Tech students either in SEM-I or SEM-II.

- **Student will get acquainted with Determination of Rigidity Modulus and Acceleration due to Gravity using Torsional Pendulum and Compound Pendulum respectively.**
- **The learner is expected to understand Wave Phenomena such as Laws of Stretched Strings apart from Variation of Magnetic Field along the Axis of Circular Coil through Electromagnetic Induction**
- **Student will be familiar with Optical Equipment such as Traveling Microscope and Spectrometer to understand the phenomena of Interference and Diffraction that will enable him to appreciate the precision measurements.**
- **The Modern Physics Experiments include introduction to Cutting Edge Technology such as Lasers and Fiber Optics in addition to the Solid State Devices such as Thermistor and Energy Band Gap of a typical Diode**

COURSE OBJECTIVES

- **To Demonstrate the Fundamental Principles of Physics**
- **To enable the student to acquire necessary patience, skill and technique in utilization of the Apparatus**
- **To Provide Modest experience that allows students to Analyze Data**
- **To correlate the Theory and Practice**

LEARNING OUTCOME

- **Ability to Design and Conduct experiments as well as to Analyze and Interpret Data**
- **Ability to Identify, Formulate, and Solve Engineering Problems.**
- **Ability to use Techniques and Skills associated with Modern Engineering Tools such as Lasers and Fiber Optics**
- **To provide Pre Requisite Hands on Experience for Engineering Laboratories**

LIST OF EXPERIMENTS (Any Twelve Experiments have to be completed)

1. Determination of Rigidity Modulus of the Material of Wire using Torsional Pendulum
2. Verification of Laws of Transverse vibrations in Stretched Strings using Sonometer
3. Wedge method – Determination of Thickness of Thin Object (hair)
4. Determination of Numerical Aperture and Bending Loss of an Optical Fiber
5. Determination of Acceleration due to Gravity (g) using Compound Pendulum
6. Determination of Energy Band Gap using the given Semiconductor Diode
7. Newton's Rings – Determination of the Radius of Curvature of given Convex Lens
8. Slit Width Determination with Single Slit Diffraction Phenomena using LASER
9. Determination of Thermal Coefficient using Thermistor
10. Determination of Wavelength of Monochromatic Source using LASER Diffraction
11. Determination of the Frequency of the given Tuning Fork using Volume Resonator
12. Study of the variation of Magnetic Field along the axis of a Circular Coil using Stewart and Gee's Method.
13. Diffraction Grating - Normal Incidence Method; Determination of Wavelength of given Source of Light using Spectrometer
14. Melde's Experiment – Determination of the Frequency of the Electrically Driven Tuning Fork
15. AC Sonometer – Determination of Frequency of AC Supply

Manual / Record Books

1. Manual cum Record for Engineering Physics Lab, by Prof. M. Rama Rao, Acme Learning.

2. Lab Manual of Engineering Physics by Dr.Y. Aparna and Dr. K. Venkateswara Rao (VGS books links, Vijayawada)