

# SYLLABUS

**For**

**B.Tech. I & II Semester**

B.Tech. Scheme Common for all disciplines  
Semester - I

Sno.	Course code	Subject	Periods Per week				Distribution of Marks						Grand Total (I+II+III+IV)
			L	T	P	C	Theory (I)	MST (II)	Total (I)+(II)	Practical (III)	TW (IV)	Total (III)+(IV)	
1	C-101	Mathematics - I	3	1		4	80	20	100	-	-	-	100
2	C-102	Fundamentals of Physics	3	1	2	6	80	20	100	50	50	100	200
3	C-103	Chemistry	3	1	2	6	80	20	100	50	50	100	200
4	C-104	Basic Engg.- I	3	1	2	6	80	20	100	50	50	100	200
5	C-105	Computer Lab	-	-	2	2	-	-	-	-	50	50	50
6	C-106	Workshop Practice	-	-	2	2	-	-	-	50	50	100	100
7	C-107	English	3	1	-	4	80	20	100	-	-	-	100
8	C-108	Project - I	-	-	4	4	-	-	-	-	50	50	50
			15	5	14	34	400	100	500	200	300	500	1000

B.Tech. Scheme Common for all disciplines  
Semester - II

Sno.	Course code	Subject	Periods Per week				Distribution of Marks						Grand Total (I+II+III+IV)
				T	P	C	Theory (I)	MST (II)	Total + (II) (I)	Practical (III)	TW (IV)	Total (III) + (IV)	
1	C-201	Mathematics - II	3	1		4	80	20	100	-			100
2	C-202	Material Physics	3	1	2	6	80	20	100	50	50	100	200
3	C-203	Energy & Environment Science	3	1	-	4	80	20	100	-	-		100
4	C-204	Basic Engg.- II	3	1	2	6	80	20	100	50	50	100	200
5	C-205	Computer Science	3	1	2	6	80	20	100	50	50	100	200
6	C-206	Engg. Graphics Lab	-	-	2	2	-	-		50	50	100	100
7	C-207	Seminar/GD/Lang. Lab			2	2					50	50	50
8	C-208	Project work-II	-	-	4	4	-	-		-	50	50	50
			15	5	14	34	400	100	500	200	300	500	1000

## MATHEMATICS – I

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
C-101	Mathematics-I	L	T	P	C	End Sem	MST	External	TW	<b>100</b>
		3	1	0	4	80	20	-	-	

### **PURPOSE**

To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

### **INSTRUCTIONAL OBJECTIVES**

At the end of the course, student should be able

1. To apply advanced matrix knowledge to Engineering problems.
2. To improve their ability in solving geometrical applications of differential calculus problems.
3. To equip themselves familiar with the functions of several variables.
4. To familiarize with the applications of differential equations.
5. To expose to the concept of three dimensional analytical geometry.

### **UNIT- I MATRICES**

Characteristic equation – Eigen values and eigen vectors of a real matrix – Properties of eigen values – Caley – Hamilton theorem – Orthogonal reduction of a symmetric matrix to diagonal form – Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformations.

### **UNIT- II DIFFERENTIAL CALCULUS**

Curvature – Cartesian and polar coordinates – Circle of curvature – Involutives and Evolutes – Envelopes – Properties of envelopes.

### **UNIT- III FUNCTIONS OF SEVERAL VARIABLES**

Function of two variables – Partial derivatives – Total differential – Taylor's expansion – Maxima and Minima – Constrained Maxima and Minima by Lagrangean Multiplier method – Jacobians

## **UNIT-IV ORDINARY DIFFERENTIAL EQUATIONS**

Simultaneous first order linear equations with constant coefficients – Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form

## **UNIT- V THREE DIMENSIONAL ANALYTICAL GEOMETRY**

Direction cosines and ratios – Angle between two lines – Equation of a plane – Equation of a straight line – Coplanar lines – Shortest distance between skew lines – Sphere – Tangent plane – Plane section of a sphere – Orthogonal spheres.

### **TEXT BOOK**

1. Grewal B.S, Higher Engg Maths, Khanna Publications, 38th Edition., Veerajan, T., *Engineering Mathematics*, Tata McGraw Hill Publishing Co., New Delhi,2000.
2. Dr.V.Ramamurthy & Dr. Sundarammal Kesavan,” *Engineering Mathematics*” – Vol I & II Anuradha Publications, Revised Edition 2006.

### **REFERENCE BOOKS**

1. Kreyszig.E, “*Advanced Engineering Mathematics*”, 8th edition, John Wiley & Sons. Singapore,2001.
2. Kandasamy P etal. “*Engineering Mathematics*”, Vol.I (4th revised edition), S.Chand &Co., New Delhi,2000.
3. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G., “*Advanced Mathematics for Engineering students*”, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
4. Venkataraman M.K., “*Engineering Mathematics*” – First Year (2nd edition), National Publishing Co., Chennai,2000.

## FUNDAMENTAL OF PHYSICS

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
C-102	Fundamental of Physics	L	T	P	C	End Sem	MST	External	TW	<b>200</b>
		3	1	2	6	80	20	50	50	

### PURPOSE

The purpose of this course is to develop scientific temper and analytical capability through learning physical concepts and their applications in engineering and technology. Comprehension of some basic physical concepts will enable the students to logically solve engineering problems.

### INSTRUCTIONAL OBJECTIVES

At the end of the course, the student will be able to:

1. Understand the general scientific concepts required for technology,
2. Apply the concepts in solving engineering problems,
3. Explain scientifically the new developments in engineering and technology, and
4. Get familiarized with the concepts, theories, and models behind many technological applications.

### UNIT – I WAVE OPTICS-I

**Interference**- definition, types, explanation of interference, Interference by division of wave front: Fresnel's biprism, fringe width, Interference in thin films Wedge shaped films, Interference by division of amplitude: Newton's rings, Michelson's Interferometer and its applications.

### UNIT – II WAVE OPTICS-II

**Diffraction** :- Introduction - Differences between Fresnel and Fraunhofer diffractions Single slit diffraction ( Qualitative and quantitative treatment) – Differences between interference and diffraction, resolving power of optical instruments (prism and grating).

**Polarization:**- Introduction – double refraction –Negative crystals & Positive crystals - Nicol's prism – Quarter wave plate and half wave plate – Production and detection of circularly and elliptically polarised light.

### **UNIT – III QUANTUM PHYSICS**

De Broglie's hypothesis, De Broglie's wave length, Davisson and Germer's experiment, Compton Effect, concept of wave packet & their properties, wave function & probability interpretation, Heisenberg's Uncertainty Principle, its elementary proof and applications, energy and momentum operators, time dependent and time independent Schrödinger wave equation. Application of time independent Schrödinger wave equation to particle trapped in a one dimensional square potential well.

### **UNIT- IV NUCLEAR PHYSICS**

General properties of nucleus, Nuclear model (liquid drop model and shell model), accelerator, linear particle accelerator, cyclotron, general betatron, Counters and particle detectors Geiger- Muller Counter, nuclear fission, nuclear fusion, nuclear reaction, nuclear reactors,

### **UNIT V LASER AND FIBER OPTICS**

**Laser:** Stimulated and spontaneous processes, main part of laser, laser action population inversion, pumping, Optical resonators, characteristics of laser beam, Principles and working of Ruby, Nd:YAG, He-Ne & with energy level diagram and Applications of lasers

**Fiber Optics** - Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber (Ray theory) pulse dispersion, attenuation, losses, various uses, and application of optical fibers.

### **Text books**

1. Gaur and Gupta "Engineering Physics"
2. Tiwari and Navneet Gupta "Engineering Physics"
3. Vikram Yadav "Engineering Physics"

## **Reference books**

- 1.. Beiser, "Modern Physics", McGraw-Hill Inc., New Delhi.
- 2.. Avadhanulu and Kshirsagar "Engineering Physics".
3. Jenkins and White: "Optics", McGraw-Hill Book Company.
3. Ghatak A.K.: "Optics"
4. Mani and Mehta: "Modern Physics", Affiliated East-West Press Pvt. Ltd., 1998.
5. Sanjeev Puri: Modern Physics, Narosa Pub.Co. 2004.
7. Kaplan: Nuclear Physics, Narosa Publishing, 1987.
- 8.. Tyagrajan and Ghatak: Lasers, Macmillan, 2001.
9. Keiser: G Optical fiber Communication, McGraw-Hill, 2000.

## **LIST OF EXPERIMENTS**

1. Fresnel Biprism,
2. Newton's Rings,
3. Michelson's Interferometer.
4. Resolving Powers –Telescope,
5. Spectrometers-R.I., Wavelength, using prism and grating
6. . Optical polarization based experiments: Brewster's angle, polarimeter etc.
7. Measurements of wavelength of LASER
8. To study the CRO.
9. Charging and discharging of capacitor
10. Other conceptual experiments related to theory syllabus



## CHEMISTRY

Course Code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-103	Chemistry	3	1	2	6	80	20	50	50	<b>200</b>

### **PURPOSE**

To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

### **INSTRUCTIONAL OBJECTIVES**

1. The role of applied chemistry in the field of engineering.
2. The knowledge of water quality parameters and the treatment of water.
3. The principles involves in corrosion and inhibitions.
4. Significance of fuels and lubricants in the field of engineering and technology.
5. Important analytical techniques, instrumentation and the applications.

### **UNIT-I TECHNOLOGY OF WATER**

Source of water, Impurities in water, Analysis of water- Hardness of water, Estimation of Hardness, Alkalinity of water, Determination of alkalinity, Disadvantages of using hard water in boiler- sludge and scale formation, Boiler corrosion, Water softening techniques (Internal and External treatment), treatment of water for domestic purposes.

### **UNIT-II CORROSION AND ITS CONTROL**

Corrosion: Basic concept- Principles, Mechanism of Dry or Chemical Corrosion and Wet or Electrochemical Corrosion, Pilling Bedworth rule, Types of corrosion- Galvanic corrosion, Concentration cell corrosion, Pitting corrosion, Stress corrosion, Microbiological corrosion, Factors influencing corrosion, Corrosion control.

### **UNIT-III**

#### **A. FUELS**

Definition & Classification of fuels, Calorific values, Analysis of coal, Carbonization of coal, Manufacturing of coke & recovery of by products. Cracking, Knocking, Anti-knocking, Octane & Cetane number, Gaseous fuels

#### **B. LUBRICANTS**

Introduction, functions & classification of lubricants, Mechanism of lubrication, Properties and Testing of lubricants.

### **UNIT- IV POLYMERS**

Introduction and classification of polymers, Types of polymerization: addition or chain polymerization, condensation polymerization, Mechanism of addition polymerization - Free radical and Ionic polymerization, Ziegler Natta

polymerization, Vulcanization of rubbers, Preparation, Properties and Applications of important polymers- Polyethylene, PVC, PMMA, Nylons, Terylene, Glyptal, Bakelite, Urea-formaldehyde, Silicone resin, Neoprene, Buna S, Buna N.

#### **UNIT-V INSTRUMENTATIONAL METHODS OF CHEMICAL ANALYSIS**

Introduction to Spectroscopy, Electromagnetic spectrum, Introduction, Principle, Instrumentation and Application of IR, UV- Visible, NMR, Basic Principle and Instrumentation of Potentiometry, Flame photometry and Chromatography.

#### **TEXT BOOKS**

1. Jain.P.C and Monika Jain, *Engineering Chemistry*, Danpat Raj publishing company (P) Ltd, New Delhi – 2002.
2. Dara.S.S, *Text book of Engineering Chemistry*, S. Chand & Company Ltd, New Delhi
3. Sharma B.K., “*Instrumental methods of chemical analysis*” 24th Edition Krishna Prakashan Media Pvt. Ltd, Meerut, 2005.

#### **REFERENCE BOOKS**

1. Kuriacose J.C. and Rajaram J. *Chemistry in Engineering and Technology*, Volume II, Tata McGraw Hill p.b. Co., 1988.
2. Jeyalakshmi.R & Ramar. P, *Engineering Chemistry*, 1st Edition, Devi Publications, Chennai 2006.
3. Rattan S., *Text book of Engineering Chemistry*, S.K. Kataria and Sons, Publication, 1st Edition, New Delhi, 2012
4. Chawla S., *Theory and Practicals of Engineering Chemistry*, Dhanpat Rai & Co. (Pvt.) Ltd. 6th Edition, New Delhi – 2011.

#### **LIST OF EXPERIMENTS**

1. Preparation of standard solutions.
2. Conductometric titration-determination of strength of an acid.
3. Determination of alkalinity, hydroxyl, carbonate and bicarbonate in water.
4. Determination of total hardness in water using EDTA titrations.
5. Estimation of iron by potentiometer.
6. Estimation of Copper in Ore
7. Determination of viscosity of lubricating oil with change of temperature by-
  - a. Red Wood Viscometer Number 1
  - b. Red Wood Viscometer Number 2
8. Determination of Flash and Fire point of liquid fuel and lubricants by-
  - a. Cleaveland’s Open Cup Method
  - b. Abel’s Flash Point Apparatus
  - c. Pensky Martin’s Flash Point Apparatus.
9. Determination of Cloud and Pour point of lubricants by Cloud and Pour point Apparatus.
10. Determination of carbon residue of lubricants by Conradson’s Apparatus.

#### **REFERENCE BOOKS**

1. Chemistry department manual, Edition, 2008.
2. Chawla S., *Theory and Practicals of Engineering Chemistry*, Dhanpat Rai & Co. (Pvt.) Ltd. 6th Edition, New Delhi – 2011.

## BASIC ENGINEERING – I

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-104	Basic Engg.-I	3	1	2	6	80	20	50	50	<b>200</b>

### **PURPOSE**

This course provides comprehensive idea about circuit analysis, working principles of machines. It also provides fundamentals of electronic devices.

### **INSTRUCTIONAL OBJECTIVES**

At the end of the course students will be able

1. To understand the basic concepts of magnetic, AC & DC circuits.
2. To explain the working principle, construction, applications of DC & AC machines .
3. To gain knowledge about the fundamentals of electric components, devices & integrated circuits.

### **UNIT I - AC & DC CIRCUITS**

Circuit parameters, Ohms law, Kirchhoff's law. Average and RMS values, concept of phasor representation, RLC series circuits and series resonance, RLC parallel circuits (includes simple problems in DC & AC circuits) Introduction to three phase systems – types of connections, relationship between line and phase values.

### **UNIT II - MAGNETIC CIRCUITS**

Definition of mmf, flux and reluctance, leakage flux, fringing, magnetic materials and B-H relationship. Problems involving simple magnetic circuits. Faraday's laws, induced emfs and inductances, brief idea on Hysteresis and eddy currents.

### **UNIT III - ELECTRICAL MACHINES**

Working principle, construction and applications of DC machines and AC machines (single phase transformers, single phase induction motors – split phase, capacitor start and capacitor start & run motors).

### **UNIT: -IV DIGITAL ELECTRONICS**

– Number system, Boolean Theorems, DeMorgan's Theorem, Logic gates, Implementation of Boolean expression using logic gates, Half adder, Full adder.

**Electronic Components** – Resistors, Inductors and Capacitors and their types. CRO.

**UNIT:-V SEMICONDUCTOR** – Energy band diagram, Intrinsic and Extrinsic semi conductors, PN Junction diode, Zener diode and their V-I characteristics , Zener diode used as a Voltage regulator, Light emitting diode and Photo diode.

**Rectifier** – Half wave and full wave Rectifier and their efficiency and ripple factor, Filters.

**Text Books**

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
2. S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
3. Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, II Edition
4. Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH.
5. Mehta V.K., Principals of Electronics, S. Chand & Co.
6. Moris Mano, Digital Electronics, PHI Pub.
7. Kalsi H.s. , Electronics Instrumentation, ISTE Pub.

**Reference Books**

1. Kothari D. P and Nagrath IJ, Basic Electrical Engineering, Tata McGraw-Hill, 1991.
2. Thomas L.Floyd Electronic devices, Addison Wesley Longman (Singapore) Pvt . Ltd., 5th Edition.

**List of Experiments**

1. Study of KVL and KCL.
2. Study of Transformer, name plate rating, determination of ratio and polarity.
3. Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions and verification by load test.
4. Identification and testing of different Electronics components.
5. Observing input and output waveforms of rectifiers.
6. Verification of truth table for various gates.
7. To study the V-I characteristics of PN diode and Zener Diode.
8. To implement basic logic gate by using universal gate(NAND & NOR).
9. Measurement of frequency and time period of a signal using CRO.

## COMPUTER LAB.

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-105	Computer Lab.	0	0	2	2	-	-	50	50	100

### PURPOSE

This Lab Course will enable the students to understand the basics of computer and to know the basics of MSOffice.

### INSTRUCTIONAL OBJECTIVES

1. To learn the basics of computer, Computer Peripherals and its application in real world.
2. Demonstration on Ms-Word, Ms-Excel, Ms-Power Point and Ms-Access

### TEXT BOOK

1. *Introduction to Information Technology* ITL Education Solutions Ltd., Pearson 2nd Edition, 2006.

### LIST OF EXPERIMENTS

1. Study experiment on evolution of computer programming languages.
2. Suggest some of the Network Topologies that can be incorporated in your campus. Justify your choice.
3. Experiments to demonstrate directory creation and file creation.
4. Create a document with all formatting effects.
5. Create a document with tables.
6. Create labels in MS word.
7. Create a document to send mails using mail merge option.
8. Create an Excel File to analyze the student's performance. Create a chart for the above data to depict it diagrammatically.
9. Create Excel sheet to use built-in-function like sum, count, countif ,if, etc.
10. Create Excel sheet to maintain employee information and use this data to send mails using mail merge.
11. Create a Power Point presentation for your personal profile with varying animation effects with timer.
12. Consider student information system which stores student personal data, mark information and non-academic details.
  - \* Use MS Access to create Tables and execute SQL queries to do this following
  - \* Display all student records.
  - \* Display student details with respect to his identity.
  - \* Delete some records from the table.
  - \* Find total marks obtained by student in each list.

## WORKSHOP PRACTICE

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-106	Workshop Practice	-	-	2	2	--	--	30	20	<b>50</b>

### PURPOSE

To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.

### INSTRUCTIONAL OBJECTIVES

To familiarize with

1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

### TEXT BOOKS

1. Gopal, T.V., Kumar, T., and Murali, G., *A first course on workshop practice – Theory, practice and work book*, Suma Publications, 2005.

### REFERENCE BOOKS

1. Kannaiah,P. & Narayanan,K.C. *Manual on Workshop Practice*, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy, V.S. , *First year Engineering Workshop Practice*, Ramalinga Publications, Madurai, 1999.

### LIST OF EXPERIMENTS

#### EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.

#### FITTING

Tools & Equipments – Practice in Filing and Drilling.  
Making Vee Joints, Square, dovetail joints, Key Making.

#### CARPENTRY

Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.

#### SHEET METAL

Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.

#### WELDING

Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet. Demonstration of Gas welding, TIG & MIG.

#### SMITHY

Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

## ENGLISH

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-107	English	3	1	-	4	80	20	--	--	<b>100</b>

### **PURPOSE**

English is an International Language which is used and accepted globally. To attain an adequate mastery of communicative English Language training primarily - reading and writing skills, secondarily listening and speaking skills.

### **INSTRUCTIONAL OBJECTIVES**

To provide language training to the engineering students which will enable them to understand and acquire knowledge in technical subjects.

### **UNIT 1 : LANGUAGES AND SKILLS OF COMMUNICATION**

Linguistic Techniques, Reading Comprehension, Phonetic symbols/signs, Oral Presentation, Process of communication, Verbal and non-verbal Communication, Barriers of communication

### **UNIT 2 : APPLICATION OF LINGUISTIC ABILITY**

Definitions of Engineering terms, objects, processes & principles ,Paragraph Writing on topics of General Interest, Importance of Listening Skills, Unseen Passage, Conversational Dialogues

### **UNIT 3 : LETTER WRITING**

Applications, Enquiry & Complaint letters, Calling & Sending quotations, Placing orders, Tenders.

### **UNIT 4 : PRECISE WRITING**

Slogan – Writing, Technical Description of Simple engineering objects & processes, Note – making.

### **UNIT 5 : REPORT WRITING**

Observation Report, Survey Report, Report of Trouble, Laboratory Report, Project Report, Telephonic Etiquettes, Debate, Speech.

### **TEXT BOOKS**

1. Abraham Benjamin Samuel *Practical Communication Communicative English LSRW2000* – SRMEC –June 2006 Revised Edition.
2. Staff of the Department of Humanities and Social Science, Anna University, “*English for Engineers /Technologist Vol.-I*”. Orient Longman, 1990.

### **REFERENCE BOOKS**

1. Herbert. A. J. *The structure of Technical English* Orient Longman 1995.
2. Pickett and Laster, ‘*Technical English, Writing, Reading and Speaking*’, New York Harper and Row Publications, 1997.
3. *Interactive course in phonetics and spoken English* published by Acoustics Engineers (ACEN) 2002.

## PROJECT WORK – I

Course code	Subject	Periods per week				Theory Slot		Practical		Total Marks
C-108	Project Work-I	L	T	P	C	End Sem	MST	External	TW	<b>50</b>
		-	-	4	4	--	--	--	50	

The objectives of the course ‘Project work’ are

1. To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
2. To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
3. To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
4. To adapt students for latest developments and to handle independently new situations.
5. To develop good expressions power and presentation abilities in students.

The faculty and student should work according to following schedule:

- i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.
- ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
- iii) At all the steps of the project, students must submit a written report of the same.



## MATHEMATICS II

Course code	Subject	Periods per week	Theory Slot 100		Practical		Total Marks
C-201	Mathematics -II	L	T	P	C	External	TW
		3	1	-	4	-	-
				End Sem	MST		
				80	20		
							<b>100</b>

### PURPOSE

To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

### INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able

1. To apply Laplace Transform knowledge to Engineering problems.
2. To apply Fourier Series knowledge to Engineering problems.
3. To improve their ability in solving differential calculus problems.
4. To familiarize with the applications of differential equations.
5. To expose to the concept of Vector calculus.

**Unit I - Laplace Transform:** Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations

**Unit II - Fourier Series:** Introduction of Fourier series, Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series  
**Fourier Transform:** Definition and properties of Fourier transform.

**Unit III - Second Order linear differential equation with variable coefficients :** Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method

**Unit IV - Linear and Non Linear partial differential equation of first order:** Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation. Separation of variable method for the solution of wave and heat equations.

**Unit V - Vector Calculus:** Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem

### TEXT BOOK

1. Grewal B.S, Higher Engg Maths, Khanna Publications, 38th Edition., Veerajan, T., *Engineering*

### References

- (i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
- (ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (iii) Advance Engineering Mathematics by D.G.Guffy
- (iv) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (v) Engineering Mathematics by S S Sastri. P.H.I.

## Material Physics C-202

Course code	Subject	Periods per week	Theory Slot 100		Practical	Total Marks
C-202	Material Physics	L	T	P	C	<b>200</b>
		3	1	2	6	
		End Sem		MST		
		80		20		
		External		TW		
		50		50		

### **PURPOSE**

The purpose of this course is to develop comprehension of the rapidly changing technological scenario and the requisite expertise for appropriate selection of materials for specific engineering applications.

### **INSTRUCTIONAL OBJECTIVES**

At the end of the course, the student will be able to:

1. Understand electrical properties of materials,
2. Understand the properties and applications of semi conducting materials,
3. Understand general properties and applications of magnetic and dielectric materials,
4. Understand the behaviour of materials on exposure to light,
5. Understand general properties and application of modern engineering and bio materials, and
6. Get familiarized with the concepts of Nano Science and Technology.

### **UNIT I - STRUCTURE OF MATERIALS**

Type of solids, Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in 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 – Bragg's law X-ray diffraction for crystal structure.

### **UNIT II - SEMICONDUCTING MATERIALS**

Introduction, intrinsic and extrinsic semiconductors, carrier concentration in intrinsic semiconductors, carrier concentration in n type semiconductors,

carrier concentration in p-type semiconductors, Hall effect and its applications  
- variation of carrier concentration with temperature, conductivity of extrinsic semiconductor, P-N junction – forward bias – reverse bias –V-I characteristics of a p-n junction. Basic introduction of transistors

### **UNIT III- DIELECTRIC MATERIALS**

Introduction, Fundamental definitions, Local field, Clausius- Mossotti relation, different types of electric polarization (dipolar, ionic and electronic polarizations), frequency and temperature effects on polarization, dielectric loss, dielectric breakdown, determination of dielectric constant, properties and different types of insulating materials, ferroelectric materials, spontaneous polarization in BaTiO<sub>3</sub>, electrets.

### **UNIT IV- MAGNETIC & SUPERCONDUCTING MATERIALS**

**MAGNETIC MATERIALS** Concept of magnetism- Dia, para, ferro magnetic materials · Hysteresis loop· Soft and hard magnetic material· magnetic Storages application of magnetic materials

**SUPERCONDUCTING MATERIALS** Introduction – basic theories for superconductivity Meissner effect - Properties of superconductors - Type-I and Type-II superconductors – High T<sub>c</sub> superconductors – application.

### **UNIT V -NANO MATERIALS**

Introduction to nano science, nano materials synthesis of nono materials (using different routes) properties of nano materials, carbon nano tubes, application of nano materials.

#### **Text books**

1. Gaur and Gupta "Engineering Physics"
2. Tiwari and Navneet Gupta "Engineering Physics"

3. Vikram Yadav "Engineering Physics"
4. Materials Science'. By Dr. M. Arumugam.

**Reference books**

- 1.. Beiser, "Modern Physics", McGraw-Hill Inc., New Delhi.
- 2.. Avadhanulu and Kshirsagar "Engineering Physics".3
3. Azoff: Solid State Physics, Tata McGraw-Hill, 2004.
- 4.. Theraja: B. L., Basic Electronics, S. Chand, 2002.
5. Solid State Physics by Kittel ,Wiley India
- 6.Science of Engg. Materials and Carbon Nano tubes- C. M. Shrivastava and C. Srinivasan

**List of suggestive core experiments: -**

- 1.. Uses of Potentiometers and Bridges (Electrical)
- 2.. Experiments connected with diodes
3. Experiments connected with transistor.
- 4.. Measurement of energy band gap of semiconductor.
- 5.. To study Hall effect.
- 6.. To study Solar cell.
7. To study the LED
8. Other conceptual experiments related to theory syllabus.

## **ENERGY AND ENVIRONMENTAL SCIENCE (EES)**

Course code	Subject	Periods per week	Theory Slot 100		Practical		Total Marks
C-203	EES	L	T	P	C	External	TW
		3	1	-	4	-	-
		End Sem		MST			
		80		20			
							100

### **PURPOSE**

The course provides the comprehensive knowledge in energy, environmental science, environmental issues and the management.

### **INSTRUCTIONAL OBJECTIVES**

1. To provide an idea of the challenges in the field of energy engineering, to provide a perspective on energy technology and systems
2. The importance of environmental education, ecosystem and ethics.
3. To create awareness on the various environmental pollution aspects and issues.
4. To educate the ways and means to protect the environment.
5. Important environmental issues and protection

### **UNIT-I ENERGY**

Energy, Energy scenario in world and India, Sources of energy, Renewable and non-renewable sources of energy, Advantages and disadvantages of different sources of energy- Fossil fuel, Coal, Oil, Gas, Nuclear, Solar, Wind, Geothermal, Hydel, Hydrogen and Ocean energy.

### **UNIT-II ENVIRONMENT AND ECOSYSTEM**

Ecology and ecosystem, Structure and types of an ecosystem, Food chain and food web, segment of Environment-Atmosphere, Hydrosphere, Lithosphere, Biosphere, Cycles in ecosystem- Gaseous, Sedimentary and Water.

### **UNIT-III ENVIRONMENTAL POLLUTION-I**

Introduction, Air Pollution, Lapse Rate and Inversion Temperature, Air Pollutants, Classification of Air Pollutants, Causes of air pollution, Adverse effect of air pollution, Acid rain, Global warming, Chemical & photochemical smog and Ozone layer depletion, Control of Air Pollution.

### **UNIT-IV ENVIRONMENTAL POLLUTION-II**

Water Pollution, Classification of water pollutants, Characteristics of waste water, Waste water treatment- Primary, Secondary and Tertiary, Eutrophication, Soil or Land Pollution, Radioactive Pollution, Noise Pollution

### **UNIT-V ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT**

Solid waste management, Treatment and disposal methods, important environmental protection act in India- water, air (prevention and control of pollution) act, Wild life conservation and forest act, Functions of central and state pollution control boards, Environmental impact assessment.

**TEXT BOOKS**

1. Sharma.B.K. and Kaur, *Environmental Chemistry*, Goel Publishing House, Meerut, 1994.
2. De A.K., *Environmental Chemistry*, New Age International Pvt. Ltd., New Delhi, 1996.
3. Kurian Joseph & R. Nagendran, *Essential of Environmental Studies*, Pearson Education, 2004.

**REFERENCE BOOKS**

1. Dara S.S., *A Text Book of Environmental Chemistry and pollution contro*, S.Chand & Company Ltd., New Delhi, 2004.
2. Jeyalakshmi.R, *Principles of Environmental Science*, 1st Edition, Devi Publications, Chennai 2006.
3. Kamaraj.P & Arthanareeswari.M, *Environmental Science – Challenges and Changes*, 1st Edition, Sudhandhira Publications, 2007.
4. Nag, P.K., *Power Plant Engineering*, Tata McGraw-Hill, New Delhi, 2006.
5. Arivalagan.K, Ramar.P & Kamatchi.P, *Principles of Environmental Science*, 1st Edition, Suji Publications, 2007.

## Basic Engineering - II

Course code	Subject	Periods per week				Theory Slot		Practical Slot		Total Marks
		L	T	P	C	End Sem	MST	External	TW	
C-204	Basic Engg.- II	3	1	2	6	80	20	50	50	<b>200</b>

### **PURPOSE**

To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer. To familiarize the students with the basics of Mechanical Engineering.

### **INSTRUCTIONAL OBJECTIVES**

1. To know about different materials and their properties.
2. Engineering aspects related to buildings.
3. To know about importance of Surveying.
4. To know about the transportation systems.
5. To get exposed to the rudiments of engineering related to Dams, Water Supply, Transportation system and Sewage Disposal.
6. The basic machine elements
7. The Sources of Energy and Power Generation
8. The various manufacturing processes

### **Unit – I Building Materials & Construction**

Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing. Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability

### **Unit – II Surveying & Positioning:**

Introduction to surveying Instruments – levels, theodolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations by different methods. Reciprocal leveling.

### **Unit - III Engineering Mechanics**

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non concurrent Co- planner forces, free Diagram, Force Diagram and Bow's notations, Application of Equilibrium Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems. Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia

### **UNIT IV Measurement**

Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainly analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set; introduction to lath, drilling, milling and shaping machines.

### **UNIT V Reciprocating Machines**

Thermodynamics: First and second law of thermodynamics; steam properties, steam processes at constant pressure, volume, enthalpy & entropy, Steam engines, hypothetical and actual indicator diagram; Carnot cycle and ideal efficiency; Otto and diesel cycles; working of two stroke & four stroke petrol & diesel IC engines.

### **TEXT BOOKS**

1. Raju K.V.B., Ravichandran P.T., *Basics of Civil Engineering*, Ayyappa Publications, Chennai, 2000.
2. Ramesh Babu, *Civil Engineering*, VRB Publishers, Chennai, 2000.
3. Kumar, T., Leenus Jesu Martin., and Murali, G., *Basic Mechanical Engineering*, Suma Publications, Chennai, 2007.
4. Prabhu, T. J., Jai Ganesh, V., Jebaraj, S., *Basic Mechanical Engineering*, Scitech Publications, Chennai, 2000.

### **REFERENCE BOOKS**

1. Rangwala, S.C., *Engineering Materials*, Charotar Publishing House, Anand,
2. National Building Code of India, Part V, *Building Materials*, 2005
3. Surendra Singh, *Building Materials*, Vikas Publishing Company, New Delhi,
4. Hajra Choudhary, S.K. and Hajra Choudhary, A. K., *Elements of Manufacturing Technology*, Vols. I & II, Media Publishers, 1986.
5. Nag, P.K., *Power Plant Engineering*, Tata McGraw-Hill, New Delhi, 2006.
3. Palanichamy, M.S., *Basic Civil & Mechanical Engineering*, Tata McGraw-Hill , New Delhi 1991.
4. Nagpal G. R., *Power Plant Engineering*, Khanna Publisher, Delhi, 2004



## COMPUTER SCIENCE

Course code	Subject	Periods per week				Theory Slot 100			Practical		Total Marks
		L	T	P	C	End Sem	MST	External	TW		
C-205	Computer Science	3	1	2	6	80	20	50	50	200	

### **PURPOSE :**

Learning Schemes on programming languages C and C++ as tools to solve problems and to provide hands on training.

### **INSTRUCTIONAL OBJECTIVES:**

After completing the course, the students should be able to

- Understand the program development life cycle
- Design algorithms to solve simple problems using programming languages.
- Convert algorithms into C and C++ programs and execution.

### **UNIT – I**

#### **PROGRAMMING FUNDAMENTALS**

Computer Basics; Program Development Life Cycle: Flow Chart, Algorithm, Compilation and Execution; Introduction to C Language: program structure, variables, keywords, data types; Input / Output functions: scanf, printf; simple programs.

### **UNIT - II**

#### **DECISION AND LOOP CONTROL STRUCTURE**

Logical operators; Decision statements: if/else, switch/case statements; Loop control statements – for, while, do/while.

### **UNIT - III**

#### **ARRAYS AND FUNCTIONS**

**Arrays:** Introduction to arrays; One dimensional array: declaration, reading and printing array elements, sorting and searching.

**Functions:** Definition; declaration of functions; return statement; recursion.

### **UNIT - IV**

#### **INTRODUCTION TO OOP CONCEPTS**

OOP concepts: classes and objects, encapsulation, inheritance, overloading, polymorphism, constructor and destructor, data hiding, simple program in C++.

### **UNIT - V**

#### **INHERITANCE AND OVERLOADING**

Inheritance – single, multiple, multilevel; Overloading – Function overloading, Operator overloading.

## **LIST OF EXERCISES:**

Note to the Instructors: Design exercise problems to demonstrate the use of C and C++ in the area of specialization.

1. programs to demonstrate the use of scanf( ) and printf( ) functions
2. programs to evaluate arithmetic expressions
3. programs using conditional statements
4. programs using for,while , do...while
5. programs on arrays
6. programs to perform matrix addition and multiplication
7. programs to implement functions
8. programs to illustrate recursion
9. Program to create classes and objects using C++
10. Program to implement Constructor and Destructor in C++
11. Program to implement single inheritance in C++
12. Program to implement Function overloading in C++
13. Program to implement Operator overloading in C++

## **REFERENCE BOOKS**

1. Kanetkar P.Yashwant, "*Let us C*", BPB publications, 2002.
2. Ashok N.Kamthane, "*Programming with ANSI and Turbo C*", Pearson Education, 2006.
3. Herbert Schildt, "*The Complete Reference C++*", TataMcGrawHill, 2001, 3rd Edition.
4. Robert Lafore, "*Object Oriented Programming in Microsoft C++*", The Waite Group, Galgotia Publications Pvt. Ltd., 2002.

## **ENGINEERING GRAPHICS**

(Only First Angle Projection is to be followed)

Course code	Subject	Periods per week				Theory Slot 100		Practical		Total Marks
C-206	Engg. Graphics	L	T	P	C	End Sem	MST	External	TW	50
		-	-	2	2	--	--	50	--	

### **PURPOSE**

1. To draw and interpret various projections of 1D, 2D and 3D objects.
2. To prepare and interpret the drawings of buildings.

### **INSTRUCTIONAL OBJECTIVES**

To familiarise with

1. The construction of geometrical figures
2. The projection of 1D, 2D & 3D elements
3. Sectioning of solids and development of surfaces
4. Preparation and interpretation of building drawing

### **FUNDAMENTALS OF ENGINEERING GRAPHICS**

Lettering, two dimensional geometrical constructions, conics, representation of three-dimensional objects – principles of projections – standard codes – projection of points.

### **PROJECTION OF LINES AND SOLIDS**

Projection of straight lines, projection of solids – auxiliary projections

### **SECTIONS AND DEVELOPMENTS**

Sections of solids and development of surfaces.

### **PICTORIAL PROJECTIONS**

Conversion of projections: Orthographic projection, isometric projection of regular solids & combination of solids.

### **BUILDING DRAWING**

Building Drawing – plan, elevation and section of single storied residential (or) office building with flat RCC roof and brick masonry walls having not more than 3 rooms (planning / designing is not expected in this course).

**TEXT BOOKS**

1. Jeyapoovan, T., *Engineering Drawing and Graphics using AutoCAD 2000*, Vikas Publishing house Pvt Ltd, NewDelhi, 2005.
2. Narayanan, K.L & Kannaiah, P., *Engineering Graphics*, Scitech Publications, Chennai, 1999.

**REFERENCE BOOKS**

1. Bhatt, N.D., *Elementary Engineering Drawing (First Angle Projection)*, Charotar Publishing Co., Anand, 1999.
2. Venugopal, K. *Engineering Drawing & Graphics*, New Age international Pvt. Ltd., 2001.
3. Natarajan, K.V. *Engineering Drawing & Graphics*, Private Publication, Chennai, 1990.
4. Shah, M.B. and Rana, B.C., *Engineering Drawing*, Pearson Education (Singapore) Pvt. Ltd., Delhi – 110 092, 2005.

## Language Lab

Course code	Subject	Periods per week				Theory Slot 100		Practical		Total Marks
C-207	Language Lab	L	T	P	C	End Sem	MST	External	TW	<b>50</b>
		-	-	2	2	-	-	-	50	

**PURPOSE:** This course intends to impart practical training in the use of English language for communicative purposes and aims to develop student's personality through language lab.

### INSTRUCTIONAL OBJECTIVES

1. To boost up the confidence in the students.
2. Improving the familiarities of the students to the English environment.
3. Improving the speaking skills.
4. Improving the reading and writing skills of the students.
5. Finally improving the overall personality of the students

### Topics to be covered in the Language Lab Sessions:

1. Introduction session
  - Introduce oneself
  - Family background
  - Educational qualification
  - Hobbies and interest
  - Expertise
  - Experience (If any)
  - Strength and weaknesses
2. Body language
  - Importance of body language
  - Dressing sense
  - Walking sense
  - Talking and communication
  - Dining and eating sense
3. Telephonic etiquettes
  - How to receive calls
  - How to respond
  - How to make a call
  - Common expressions for calling
4. PPTs presentations
5. Improving speaking skills
  - Speech practices
  - Role plays (on stage)
  - GD and Debate
  - Extempore speech
  - Word games
  - JAM (Just a minute) session
  - Describing objects and situations

## 6. Reading skills

- Improving reading skills
- Paragraph reading
- Storytelling and reading
- Audio and video sessions

## 7. Writing skills

- Paragraph writing
- Word power/ vocabulary building
- Article writing
- Translations from Hindi to English and vice-versa

## 8. Presentation skills

- Oral presentations, on all the learning sessions
- Seminar on given topics

## PROJECT WORK – II

Course code	Subject	Periods per week				Theory Slot		Practical		Total Marks
C-208	Project Work-II	L	T	P	C	End Sem	MST	External	TW	<b>50</b>
		-	-	4	4	--	--	--	50	

The objectives of the course ‘Project work’ are

1. To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
2. To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
3. To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
4. To adapt students for latest developments and to handle independently new situations.
5. To develop good expressions power and presentation abilities in students.

The faculty and student should work according to following schedule:

- i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.
- ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
- iii) At all the steps of the project, students must submit a written report of the same.