PONDICHERRY ENGINEERING COLLEGE, PUDUCHERRY – 605 014

CURRICULUM AND SYLLABI FOR AUTONOMOUS STREAM

FIRST YEAR B.TECH. COURSES
(FOR STUDENTS ADMITTED FROM ACADEMIC YEAR 2014-15 ONWARDS)

A. CURRICULUM - B.Tech. For Group I (CE, ME, CS, IT)

I SEMESTER

Subject Code	Subject	Category*	Periods			Marks#			Credits
			L	T	P	CA	SE	TM	
MA101	Mathematics I	TB	3	1	-	40	60	100	4
PH101	Engineering Physics	TA	4	-	-	40	60	100	4
CY101	Engineering Chemistry	TA	4	-	-	40	60	100	4
BE102	Basic Electrical and Electronics Engineering	TC	3	1	-	40	60	100	4
ME101	Engineering Thermodynamics	TA	3	1	-	40	60	100	4
CS101	Computer Programming	TA	3	1	-	40	60	100	4
ME102	Engineering Graphics	EGD	2	-	3	50	50	100	4
CS102	Computer Programming Laboratory	LB	-	-	3	60	40	100	2
BE103	Basic Electrical and Electronics Laboratory	LB	-	-	3	60	40	100	2
Total Credits									**32**

II SEMESTER

Subject Code	Subject	Category*	Periods			Marks#			Credits
			L	T	P	CA	SE	TM	
MA102	Mathematics II	TB	3	1	-	40	60	100	4
PH102	Material Science	TA	4	-	-	40	60	100	4
CY102	Environmental Science	TA	4	-	-	40	60	100	4
BE101	Basic Civil and Mechanical Engineering	TC	4	-	-	40	60	100	4
CE101	Engineering Mechanics	TB	3	1	-	40	60	100	4
HS101	Communicative English	TA	4	-	-	40	60	100	4
PH103	Physics Laboratory	LB	-	-	3	60	40	100	2
CY103	Chemistry Laboratory	LB	-	-	3	60	40	100	2
ME103	Workshop Practice	LB	-	-	3	60	40	100	2
Total Credits									**30**

 # CA – Continuous Assessment, **SE** – Semester Examination, **TM** – Total Marks

* TA – Theory Category A, **TB** – Theory Category B, **TC** – Theory Category C,
   LB – Laboratory, **EGD** – Engineering Graphics / Drawing

B. CURRICULUM - B.Tech. For Group II (EC, EE, EI, CH)

I SEMESTER

Subject Code	Subject	Category*	Periods			Marks#			Credits
			L	T	P	CA	SE	TM	
MA101	Mathematics I	TB	3	1	-	40	60	100	4
PH101	Engineering Physics	TA	4	-	-	40	60	100	4
CY101	Engineering Chemistry	TA	4	-	-	40	60	100	4
BE101	Basic Civil and Mechanical Engineering	TC	4	-	-	40	60	100	4
CE101	Engineering Mechanics	TB	3	1	-	40	60	100	4
HS101	Communicative English	TA	4	-	-	40	60	100	4
PH103	Physics Laboratory	LB	-	-	3	60	40	100	2
CY103	Chemistry Laboratory	LB	-	-	3	60	40	100	2
ME103	Workshop Practice	LB	-	-	3	60	40	100	2
Total Credits									**30**

II SEMESTER

Subject Code	Subject	Category*	Periods			Marks#			Credits
			L	T	P	CA	SE	TM	
MA102	Mathematics II	TB	3	1	-	40	60	100	4
PH102	Material Science	TA	4	-	-	40	60	100	4
CY102	Environmental Science	TA	4	-	-	40	60	100	4
BE102	Basic Electrical and Electronics Engineering	TC	3	1	-	40	60	100	4
ME101	Engineering Thermodynamics	TA	3	1	-	40	60	100	4
CS101	Computer Programming	TA	3	1	-	40	60	100	4
ME102	Engineering Graphics	EGD	2	-	3	50	50	100	4
CS102	Computer Programming Laboratory	LB	-	-	3	60	40	100	2
BE103	Basic Electrical and Electronics Laboratory	LB	-	-	3	60	40	100	2
Total Credits									**32**

CA – Continuous Assessment, **SE** – Semester Examination, **TM** – Total Marks

* **TA** – Theory Category A, **TB** – Theory Category B, **TC** – Theory Category C,
   LB – Laboratory, **EGD** – Engineering Graphics / Drawing

SYLLABUS

Department : Mathematics				Programme : B.Tech.			
Semester : One				Category : TB			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
MA101	Mathematics I	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	• To introduce the ideas of differential and integral calculus • To familiarize students with functions of several variables • To introduce methods for solving differential equations							
Outcome	• Understands Calculus • Functions of several variables • Able to solve differential equations							

UNIT – I		Hours: 09
Curvature, radius of curvature, evolutes and involutes. Beta and Gamma functions and their properties.		
UNIT – II		Hours: 09
Partial derivatives, Total derivative, Differentiation of implicit functions, Change of variables, Jacobians and their properties, Partial differentiation of implicit functions, Maxima and minima of functions of two variables, Lagrange's method of undetermined multipliers.		
UNIT – III		Hours: 09
Multiple Integrals, change of order of integration in double integrals, Applications: Plane areas (double integration), Change of variables (Cartesian to polar), volumes by solids of revolution, double and triple integrations (Cartesian and polar) – Center of mass and Gravity (constant and variable densities).		
UNIT – IV		Hours: 09
Exact equations, First order linear equations, Bernoulli's equation, orthogonal trajectories, growth, decay and geometrical applications. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.		
UNIT – V		Hours: 09
Linear differential equations of higher order - with constant coefficients, the operator D, Euler's linear equation of higher order with variable coefficients, simultaneous linear differential equations, solution by variation of parameters method.		

Total contact Hours: 45	Total Tutorials: 15	Total Practical Classes:	Total Hours: 60

Text Books:
1. Erwin Kreyszig, Advanced Engineering Mathematics (9th Ed), John Wiley & Sons, New Delhi, 2011.
2. Venkataraman M.K., Engineering Mathematics, Vol. I&II, National Publishing Company, Chennai, 2007.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.

Reference Books:
1. Sundaram V. et al, Engineering Mathematics, Vol. I& II, Vikas Publications, 6th Edition, 2007.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
3. Bali N. and Goyal M., Advanced Engineering Mathematics, Laxmi Publications Pvt. Ltd., New Delhi, 9th Edition, 2011.

Department : Physics				Programme : B.Tech.			
Semester : One				Category : TA			
Subject Code	**Subject**	**Hours / Week**			**Credit**	**Maximum Marks**		
		L	T	P	C	CA	SE	TM
PH101	Engineering Physics	4	-	-	4	40	60	100
Prerequisite	-							
Objectives	• To provide a bridge between basic Physics and Engineering courses. • To introduce the concepts and applications of Ultrasonics, Optics, Lasers, Optical Fibers, and wave mechanics and fundamentals of crystal structure.							
Outcome	• At the end of the course, Students would have adequate exposure to the concepts of the various topics of this Engineering Physics course and their real life applications.							

UNIT – I	**Acoustics and Ultrasonics**	**Hours: 12**

Acoustics: Factors affecting Acoustics of Buildings and their Remedies - Sabine's formula for Reverberation Time – sound absorption coefficient & its determination; **Ultrasonics:** Ultrasonic Waves- Properties-Production by Piezoelectric & Magnetostriction methods. Detection-acoustic grating and piezoelectric transducer methods. Applications of ultrasonic waves-Industrial applications, Medical application-sonogram. Flaw detection by ultrasonic NDT -Ultrasonic Pulse Echo Method.

UNIT – II	**Optics**	**Hours: 12**

Interference: Air Wedge – Michelson's Interferometer – Types of fringes- Determination of Wavelength of a light source– Antireflection Coatings -Interference Filter; **Diffraction:** Concept of Resolution of Spectral lines-Rayleigh's criterion -Resolving Power of Grating, Prism & Telescope; **Polarisation :** Basic concepts of Double Refraction and Optical Rotation- Quarter and Half Wave Plates – Specific Rotatory Power – Laurent's Half Shade Polarimeter-polarizing filters.

UNIT – III	**Crystal Structure and Lattice Defects**	**Hours: 12**

Crystal structure: Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices- Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, HCP structures – Miller Indices- Powder X Ray Diffraction Method; **Lattice Defects**: Qualitative ideas of point, line, surface and volume defects and their influence on properties of solids

UNIT – IV	**Wave Mechanics**	**Hours: 12**

Matter Waves – de Broglie hypothesis – Uncertainty Principle – Schrodinger Wave Equations – Time Dependent – Time Independent – Application to Particle in a One Dimensional potential Box –Concept of Quantum Mechanical Tunneling (without derivation) – Applications of tunneling (qualitative) to Alpha Decay, Tunnel Diode, Scanning Tunneling Microscope.

UNIT – V	**Lasers and Fiber Optics**	**Hours: 12**

Lasers : Principles of Laser – Spontaneous and Stimulated Emissions - Einstein's Coefficients – population Inversion and Laser Action –optical resonators(qualitative)- Types of Lasers – Nd:YAG, CO_2 laser, GaAs Laser- Industrial & Medical applications of Lasers; **Fiber Optics**: Principle and Propagation of light in optical fiber– Numerical aperture and acceptance angle – Types of optical fibers-based on Material, refractive index profile, Modes of propagation(single & Multimode Fibres) -Qualitative ideas of attenuation in optical Fibers-Applications of Optical Fibers- Fiber Optic communication (Schematic), Active and passive fiber optic sensors, Endoscope

Total contact Hours: 60	Total Tutorials: -	Total Practical Classes: -	Total Hours: 60

Text Books:
1. Avadhanulu M N , Engineering Physics, S. Chand & Co, 2007.
2. V Rajendran, Engineering Physics, 2nd Edition, TMH, New Delhi 2011.

Reference Books:
1. Ajoy Ghatak, Optics, 5th Edition TMH, New Delhi, 2012.
2. K.R.Nambiar, Lasers, New Age International, New Delhi, 2008.
3. K. Thyagarajan and Ajoy Ghatak, Lasers Fundamentals and Applications, 2nd Edition, Springer 2010.
4. V. Raghavan , Materials Science and Engineering- A First Course, 5th Edition, Prentice Hall of India, 2008.
5. Arthur Beiser, Concepts of Modern Physics, 6th Edition, TMH, New Delhi 2008.
6. A.S. Vasudeva, Modern Engineering Physics, S. Chand & Co, 2006.
7.

Department : Chemistry				Programme : B.Tech			
Semester : One				Category : TA			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
CY101	Engineering Chemistry	4	-	-	4	40	60	100
Prerequisite	-							
Objectives	• To know the importance of chemistry in engineering education • To understand the chemistry of industrial processes • To apply the knowledge of chemistry to solve engineering problems							
Outcome	• Students will be able to understand and appreciate usefulness of chemistry concepts in the design, fabrication and maintenance of materials for engineering applications. • Students will gain knowledge about the chemistry background of some of the important industrial processing techniques. • With the knowledge gained in conceptual chemistry, engineering students will be able to approach confidently the design and development of futuristic materials to meet the requirement of industry and society.							

UNIT – I	Water Treatment	Hours: 12

Hardness of water – units and calcium carbonate equivalent. Determination of hardness of water- EDTA method. Disadvantages of hard water-boiler scale and sludge, caustic embrittlement, priming and foaming and boiler corrosion. Water softening methods – internal and external conditioning – lime-soda process, zeolite process and ion exchange process. Desalination – reverse osmosis and electro dialysis. Specifications for drinking water, BIS and WHO standards.

UNIT – II	Industrial Polymers	Hours: 12

Classification, types of polymerization reactions - mechanism of free radical, ionic and Ziegler-Natta polymerizations. Polymer properties - chemical resistance, crystallinity and effect of temperature. Polymer molecular weight - Mn and Mw. Thermoplastics and thermosets. Rubbers – vulcanization. Synthetic rubber - Buna S, Buna N, Silicone and Butyl rubber. Conducting polymers – classification and applications. Moulding constituents of plastic. Biodegradable polymers – preparation, properties and applications of PLA, PCL and PGA. Liquid crystalline polymers.

UNIT – III	Electrochemical Cells	Hours: 12

Galvanic cells, single electrode potential, standard electrode potential, electromotive series. EMF of a cell and its measurement. Nernst equation. Electrolyte concentration cell. Reference electrodes – hydrogen, calomel, Ag/AgCl and glass electrodes. Batteries - primary and secondary batteries, Laclanche cell, lead acid storage battery, Ni-Cd battery and alkaline battery. Fuel cells - H_2-O_2 fuel cell.

UNIT – IV	Corrosion and Control	Hours: 12

Chemical and electrochemical corrosion – Galvanic, pitting, stress and concentration cell corrosion. Factors influencing corrosion. Corrosion control methods - cathodic protection and corrosion inhibitors. Protective coatings - types of protective coatings - metallic coating - tinning and galvanizing, cladding, electroplating and anodizing.

UNIT – V	Engineering Materials	Hours: 12

Abrasives – Natural and artificial abrasives. Refractories – classification, properties and manufacture. Refractory bricks – silica bricks, fire clay bricks, high alumina bricks and silicon carbide bricks. Glass and ceramics – properties, manufacture and types of glass, ceramics – clays - types, fabrication of ceramic ware. Composite materials – classification. Processing of fibre-reinforced composites, applications. Glazing.

Total contact Hours: 60	Total Tutorials: -	Total Practical Classes: -	Total Hours: 60

Text Books:
1. P.C. Jain and Monika Jain, Engineering Chemistry, Dhanpat Rai and Sons, New Delhi, 2004.
2. S.S. Dara and S.S Umare, A Textbook of Engineering Chemistry, S. Chand & Co., Ltd. New Delhi, 2013.

Reference Books:
1. B. K. Sharma, Engineering Chemistry, Krishna Prakashan Media (P) Ltd., Meerut, 2001.
2. P. Kannan, A. Ravikrishnan, Engineering Chemistry, Sri Krishna Hi-tech. Publishing Company Pvt. Ltd, Chennai, 2009.
3. V.R. Gowariker, N.V. Viswanathan and J. Sreedhar, Polymer Science, New Age Intl (P) Ltd, Chennai, 2006.

Department : Electronics and Communication Engineering / Electrical and Electronics Engineering		Programme : B.Tech					
Semester: One / Two		Category : TC					
Subject Code	**Subject**	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
BE102	Basic Electrical and Electronics Engineering	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	• To apply Kirchhoff's law to simplify the given circuit. • To understand the concept of AC circuit and to simplify the given RL, RC, RLC series and parallel circuits. • To understand the principle of electromagnetic induction and the working principle of electrical machines. • The students understand the working principle of transistor, FET, MOSFET, CMOS and their applications. • To design adders, subtractors and to gain knowledge on sequential logic circuits. • To understand the need for communication and acquire knowledge on different communication systems. • To have an overview of different emerging technologies in day-to-day applications.							
Outcome	• The students explored the basic terminology, laws and concepts of DC and AC circuits in electrical engineering. • The students know the principle of operation of DC and AC electrical machines and different types of power plants. • Will understand the importance of FET's, MOSFET's, CMOS and their applications. • Will be able to design Combinational and Sequential circuits. • Awareness towards different Communication Systems. • Gain knowledge in the working principle of real time applications used in day today life like ATM, Microwave Oven, Bluetooth, WiFi and Computer Networks.							

UNIT – I	DC Circuits	Hours: 07

Definition of Voltage, Current, Power & Energy, circuit parameters, Ohm's law, Kirchoff's law & its applications – Simple Problems - Division of current in Series & parallel circuits - star/delta conversion - Node and mesh methods of analysis of DC circuits.

UNIT – II	AC Circuits	Hours: 08

Concepts of AC circuits – rms value, average value, form and peak factors – Simple RL, RC and RLC series and parallel circuits – Concept of real and reactive power – Power factor – Series and parallel resonance - Introduction to three phase system - Power measurement by two wattmeter method.

UNIT – III	Electrical Machines and Power Plants	Hours: 08

Law   of Electromagnetic induction, Fleming's Right & Left hand rule - Principle of DC rotating machine, Single phase transformer, single phase induction motor and synchronous motor (Qualitative approach only) - Layout of thermal, hydro and nuclear power generation (block diagram approach only). Components of AC transmission and distribution systems – One line diagram.

UNIT – IV	Electronics	Hours: 07

Transistor as an Amplifier – RC Coupled Amplifier – Characteristics of JFET – MOSFET – CMOS – Block Diagram of SMPS – LED – LCD – Solar Cells.
Combinational Logic – Design of Half Adder - Half Subtractor –Full Adder – Full Subtractor – Sequential Logic – Ripple Counters – Shift Registers.

UNIT – V	Communication	Hours: 08

Need for Modulation – Block Diagram of Analog Communication System - AM, FM, PM Definitions & Waveforms – Comparison of Digital & Analog Communication System- Block Diagram of Digital Communication System – Electromagnetic Spectrum.
Wired & Wireless Channel – Block Diagram of Communication Systems – Satellite Communication – Cellular Mobile Communication – Fibre Optical Communication System.

UNIT – VI	Overview of Emerging Technologies	Hours: 07

Evolution of Mobile Communication Generations (1G, 2G, 2.5G, 3G and Beyond 3G) – Overview of Bluetooth, Wifi,

WiMax, Sensor Networks and Wireless LANs — Introduction to VLSI Technology and Embedded Systems – Internet of Things (IOT).
Microwave Ovens - RFID - Automated Teller Machines (ATM).

Total contact Hours: 45	Total Tutorials: 15	Total Practical Classes: -	Total Hours: 60

Text Books:

Electrical
1. Edward Hughes, John Hiley, Keith Brown, Ian McKenzie Smith, Electrical and Electronics Technology, Pearson Education Limited, New Delhi, 2010.
2. Kothari D P and Nagrath I J, Basic Electrical Engineering, Tata McGraw Hill, 2009.
3. S.K. Sahdev, Fundamentals of Electrical Engineering and Electronics, Dhanpat Rai & Co, 2013.

Electronics and Communication
4. Jacob Millman and Christos C. Halkias, "Electronic Devices and Circuits" Tata McGraw Hill, 2008
5. R.L. Boylestad and L. Nashelsky, "Electronic Devices and Circuit Theory", PHI Learning Private Limited, Ninth Edition, 2008
6. Morris Mano, "Digital design", PHI Learning, Fourth Edition, 2008.
7. Wayne Tomasi, "Electronic Communication Systems- Fundamentals Theory Advanced", Fourth Edition, Pearson Education, 2001.
8. Rajendra Prasad , " Fundamentals of Electronic Engineering", Cengage learning , New Delhi, First Edition, 2011.
9. William Stallings, " Wireless Communication and Networks", Second Edition, Pearson Education, 2011.

Reference Books:

Electrical
1. R.Muthusubramaniam, S.Salivahanan and K.A. Muraleedharan, Basic Electrical Electronics and Computer Engineering, Tata McGraw Hill, 2004.
2. Rejendra Prasad, Fundamentals of Electrical Engineering. Prentice Hall of India, 2006.

Electronics and Communication
3. David. A. Bell, "Electronic Devices and Circuits", PHI Learning Private Ltd, India, Fourth Edition, 2008.
4. Donald P Leach, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications," 6th edition,Tata McGraw Hill Publishing Company Ltd.,New Delhi,2008.
5. Roddy and Collen, "Communication Systems", PHI learning, 2001.
6. George Kennedy and Bernard Davis, Electronics communication Systems, Tata McGraw-Hill Ltd, New Delhi, 2007.

Web sites:
1. www.electronics-tutorials.ws
2. www.en.wikipedia.org/wiki/Telecommunication
3. www.nptel.ac.in/courses/IIT-MADRAS/Basic_Electronics.../LECTURE1.pdf

Department : Mechanical Engineering				Programme : B.Tech.			
Semester : One/Two				Category : TA			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
ME101	Engineering Thermodynamics	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	• To convey the basics of the thermodynamic principles • To establish the relationship of these principles to thermal system behaviors • To develop methodologies for predicting the system behavior • To establish the importance of laws of thermodynamics applied to energy systems • To explain the role of refrigeration and heat pump as energy systems • To develop an intuitive understanding of underlying physical mechanism and a mastery of solving practical problems in real world.							
Outcome	• Parallels are drawn between the subject and the student's everyday experience so that this course may be related to what the students already know. • Students are made to understand the principles of thermodynamics and adjudge the viability of operation of any thermal system in real time applications • Students are encouraged to make engineering judgments, to conduct independent exploration of topic of thermodynamics and to communicate the findings in a professional manner. • Students are made to develop natural curiosity to explore the various facets of thermodynamic laws. • While emphasizing basic laws, students are provided with modern tools to use in real time engineering problems.							

UNIT – I	Hours: 09

Energy conversion and efficiencies of steam and nuclear power plants, internal combustion engines, gas turbine and refrigeration systems- Thermodynamic systems, properties and state - Thermodynamic equilibrium- path and point functions - Temperature - Zeroth law of thermodynamics – Pure substance - P, V and T surface – steam formation-quality-dryness fraction-Thermodynamic property diagrams and charts in common use.

UNIT – II	Hours: 09

The concept of energy, work and heat – reversible work- internal energy -Perfect gas – specific heats – Joules law - enthalpy- Conservation of Energy principle for closed and open systems - First law of thermodynamics – Application of first law to a process (flow and non-flow) – Steady flow energy equation and its engineering application - Calculation of work and heat for different processes.

UNIT – III	Hours: 09

Limitations of first law – Performance of heat engines – Reversible and irreversible processes – Statements of second law of thermodynamics - Carnot principle - Clausius inequality- Entropy – temperature entropy diagram – entropy change for a closed and open systems.

UNIT –IV	Hours: 09

Air standard cycles: The air standard Carnot cycle - Air standard Otto cycle, diesel cycle, dual cycle and their comparison – Gas turbine - Brayton cycles and their efficiencies.

UNIT – V	Hours: 09

Reverse Carnot cycle - COP - Vapor compression refrigeration cycle and systems (only theory) - Gas refrigeration cycle - Absorption refrigeration system – Liquefaction – Solidification (only theory).

Total contact Hours: 45	Total Tutorials: 15	Total Practical Classes: -	Total Hours: 60

Text Books:

1. Nag, P. K., "Engineering Thermodynamics", 5thedition, McGraw - Hill Education India Pvt. Ltd., New Delhi, 2013.
2. Burghardt, M.D. and James A Harbach, "Engineering Thermodynamics", 4th edition, Harper Collins college publisher, N.Y.,1993.

Reference Books:

1. Arora, C.P., "Thermodynamics", Tata Mc Graw Hill Publishing Co. Ltd., New Delhi, 2003.

2. Wark, K., "Thermodynamics", 4th edition , Mc Graw Hill, N.Y.,1985.

3. Huang, F.F., "Engineering Thermodynamics" 2nd edition, Macmillan Publishing Co. Ltd., N.Y., 1989.

4. Cengel, Y.A. and Boles, M.A., "Thermodynamics - An Engineering Approach", 7th edition, Tata Mc-Graw Hill Education, 2011.

Web sites:

1. http://nptel.iitm.ac.in/courses/Webcourse-contents/
2. http://ocw.mit.edu/courses/mechanical-engineering/

Department : Computer Science and Engineering / Information Technology		Programme : B.Tech.					
Semester : One / Two		Category : TA					
Subject Code	**Subject**	**Hours / Week**			**Credit**	**Maximum Marks**	
		L	T	P	C	CA	SE	TM
CS101	Computer Programming	3	1	-	4	40	60	100
Prerequisite								
Objectives	• To introduce the basics of computers and information technology. • To educate problem solving techniques. • To impart programming skills in C language. • To practice structured programming to solve real life problems.							
Outcome	On successful completion of the course, students will be able to: • Understand the basics of computers and its related components • Have the ability to write a computer program to solve specified problems							
UNIT – I				**Hours: 09**				
History and Classifications of Computers – Components of a Computer – Working Principle of Computer – Hardware – Software and its Types – Applications of Computers –Network and its Types – Internet and its services – Intranet– Extranet – Generations of Programming Languages – Introduction to Number System – Introduction to MS-Office Package.								
UNIT – II				**Hours: 09**				
Problem solving techniques – Program development life-cycle – Algorithm – Complexities of Algorithm – Flowchart – Pseudo code. Introduction to C –C Program Structure – C tokens: Keyword, Identifiers, Constants, Variable, Data types (simple and user-defined) – Operators and its types – Operator Precedence – Expression Evaluation – Type Conversion – Input/output operations.								
UNIT – III				**Hours: 09**				
Branching Statements – Looping Statements – Arrays – Multidimensional arrays. Functions: Function Prototype, Passing Arguments to Function – Call by Value and Call by Reference – Nested function call – Library Functions – User-defined Functions – Recursion. Strings – String I/O functions, String Library functions – Storage classes.								
UNIT – IV				**Hours: 09**				
Structures – Arrays and Structures – Nested structures – Structure as Argument to functions– Union Pointers – Declaration, Initialization and Accessing Pointer variable – Pointers and arrays – pointers as argument and return value – Pointers and strings - pointers and structures.								
UNIT – V				**Hours: 09**				
Introduction to File Concepts in C – File types – I/O operations on files – File modes – Random access to files – Command line arguments. Dynamic Memory Allocation: MALLOC, CALLOC, FREE, REALLOC Introduction to preprocessor – Macro substitution directives – File inclusion directives –Compiler Control directives – Miscellaneous directives.								
Total contact Hours: 45		**Total Tutorials: 15**		**Total Practical Classes: -**		**Total Hours: 60**		
Text Books:								
1. J. B. Dixit, "Computer Fundamentals and Programming in C", Firewall Media, 2009. 2. Balagurusamy. E, "Programming in ANSI C", Tata McGraw Hill, Sixth edition, 2012.								
Reference Books:								
1. Ashok N Kamthane, "Computer Programming", Pearson education, Second Impression, 2008. 2. Venugopal.K and Kavichithra.C, "Computer Programming", New Age International Publishers, First Edition, 2007.								

Department : Mechanical Engineering				Programme : B.Tech			
Semester: One / Two				Category : EGD			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
ME102	Engineering Graphics	2	-	3	4	50	50	100
Prerequisite	-							
Objectives	• To convey the basics of engineering drawing • To explain the importance of an engineering drawing • To teach different methods of making the drawing • To establish the importance of projects and developments made in drawing that are used in real systems							
Outcome	• From what students have already learnt and know, relation has been brought about how to bring their vision into realities. • Students are made to follow and understand the basic of mechanical drawing • Students are encouraged to make engineering drawing of physical object representing engineering systems. • Students are made to develop natural curiosity to explore the various facets of engineering drawings.							
UNIT – 0					Not for exam			
Introduction to Standards for Engineering Drawing practice, Lettering, Line work and Dimensioning.								
UNIT – I					Hours: T-06; P-09			
Projection of Points and Projection of lines								
UNIT – II					Hours: T-06; P-09			
Projection of Planes and Projections of solids in simple positions								
UNIT – III					Hours: T-06; P-09			
Projection of solids in complicated positions								
UNIT – IV					Hours: T-06; P-09			
Sections of solids - Development of Surfaces								
UNIT – V					Hours: T-06; P-09			
Axonometric Projections: Isometric Projections (simple solids); Perspective Projections (planes and simple solids; Orthographic Projections								
Total contact Hours: 30		Total Tutorials: -		Total Practical Classes: 45		Total Hours: 75		

Text Books:

1. K.R. Gopalakrishna and Sudhir Gopalakrishna, Engineering Graphics, Inzinc Publishers, 2007.
2. K. Venugopal, Engineering Drawing and Graphics + Auto CAD, 4th edition, New Age International Publication Ltd., 2004.
3. BIS, Engineering Drawing practices for Schools & College, SP 46 : 2003

Reference Books:

1. N.D. Bhatt, Engineering Drawing, 49th edition, Charotar Publishing House, 2006.
2. K.V. Natarajan, A Text Book of Engineering Drawing, Dhanalakshmi Publishers, 2006.
3. David I cook and Robert N Mc Dougal, Engineering Graphics and Design with computer applications, Holt – Sounders Int. Edn. 1985.
4. James D Bethune and et. al., Modern Drafting, Prentice Hall Int.,

Web sites:

1. http://www.3ds.com/products/catia/
2. http://en.wikipedia.org/wiki/CATIA

Department :	Computer Science and Engineering/ Information Technology	Programme : B.Tech.						
Semester : One / Two		Category : LB						
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
CS102	Computer Programming Laboratory	-	-	3	2	60	40	100
Prerequisite	-							
Objectives	• To study and understand the use of OS commands • To get familiarity on MS-Office packages like MS-Word, MS-Excel and MS-Powerpoint • To gain a hands on experience of compilation and execution of 'C' programs • To inculcate logical and practical thinking towards problem solving using C programming.							
Outcome	On successful completion of the course, students will be able to: • Have the ability to write a computer program to solve specified problems • Problem solving ability will be gained by the students							
Cycle - I	**Fundamentals of Computing** 1. Study of OS commands 2. Use of mail merge in word processor 3. Use of spreadsheet to create Charts (XY, Bar, Pie) with necessary formulae. 4. Use of Power point to prepare a slide show.	Hours: 09						

Cycle - II	**Programming Using C**
	 1. Study of Compilation and execution of simple C programs
	 2. Basic C Programs
	    a. Arithmetic Operations
	    b. Area and Circumference of a circle
	    c. Swapping with and without Temporary Variables
	 3. Programs using Branching statements
	    a. To check the number as Odd or Even
	    b. Greatest of Three Numbers
	    c. Counting Vowels
	    d. Grading based on Student's Mark
	 4. Programs using Control Structures
	    a. Computing Factorial of a number
	    b. Fibonacci Series generation
	    c. Prime Number Checking
	    d. Computing Sum of Digit
	 5. Programs using String Operations
	    a. Palindrome Checking
	    b. Searching and Sorting Names
	 6. Programs using Arrays
	    a. Sum of 'n' numbers
	    b. Sorting an Array
	    c. Matrix Addition, Subtraction, Multiplication and Transpose
	 7. Programs using Functions
	    a. Computing nCr
	    b. Factorial using Recursion
	    c. Call by Value and Call by Reference
	 8. Programs using Structure
	    a. Student Information System
	    b. Employee Pay Slip Generation
	    c. Electricity Bill Generation
	 9. Programs using Pointers
	    a. Pointer and Array
	    b. Pointer to function
		Hours: 36						

	c. Pointer to Structure
	10. Programs using File Operation
	     a. Counting No. of Lines, Characters and Black Spaces
	     b. Content copy from one file to another
	     c. Reading and Writing Data in File		

Total contact Hours: -	**Total Tutorials: -**	**Total Practical Classes: 45**	**Total Hours: 45**

Department : Electronics and Communication Engineering / Electrical and Electronics Engineering		Programme: B.Tech.						
Semester : One / Two		**Category** : LB						
Subject Code	**Subject**	**Hours / Week**			**Credit**	**Maximum Marks**		
		L	T	P	C	CA	SE	TM
BE103	Basic Electrical and Electronics Engineering Laboratory	-	-	3	2	60	40	100
Prerequisite	-							
Objectives	• To understand the basic electrical tools and their applications. • To get trained in using different types of wiring. • To find faults in electrical lamp and ceiling fan. • To understand and apply Kirchhoff's laws to analyze electrical circuits. • To study the operation of CRO and principle of fiber optic communication. • To design adder and subtractors. • To understand the frequency response of RC coupled amplifier.							
Outcome	• The students get exposure on the basic electrical tools, applications and precautions. • The students are trained for using different types of wiring for various purposes in domestic and industries. • The students are taught to find faults in electrical lamp and ceiling fan. • Will be able to learn and use equipments like Signal Generator, Power Supply and CRO. • To apply Kirchhoff's law for simplification of circuits. • To design combinational circuits. • To obtain the frequency response of Amplifiers.							

List of Experiments	**Electrical Lab**
	   1. Electrical Safety, Precautions, study of tools and accessories.
	   2. Practices of different joints.
	   3. Wiring and testing of series and parallel lamp circuits.
	   4. Staircase wiring.
	   5. Doctor's room wiring.
	   6. Bed room wiring.
	   7. Go down wiring.
	   8. Wiring and testing a ceiling fan and fluorescent lamp circuit.
	   9. Study of different types of fuses and A.C. and D.C. meters.							

List of Experiments	**Electronics and Communication Lab**
	   1. Study of Kirchoff's Laws.
	   2. Study of Fiber Optic Communication.
	   3. Study of Cathode Ray Oscilloscope.
	   4. Zener Diode as Voltage Regulator.
	   5. Design of Adder and Subtractor Circuits.
	   6. Frequency Response of RC Coupled Amplifier.							

Total contact Hours: -		**Total Tutorials: -**		**Total Practical Classes: 45**			**Total Hours: 45**	

Department : Mathematics				Programme : B.Tech.			
Semester : Two				Category : TB			
Subject Code	**Subject**	**Hours / Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**SE**	**TM**
MA102	Mathematics II	3	1	-	4	40	60	100

Prerequisite	-
Objectives	- To acquaint with theory of Matrices - Hyperbolic functions and theory of equations - Vector calculus and statistics
Outcome	- Understands Matrix theory - Solving techniques of equations - Understands Vectors and statistics

UNIT – I	Matrix Theory	Hours: 09

Eigen values and Eigen vectors of a real matrix, Characteristic equation, Properties of Eigen values. Cayley-Hamilton Theorem, Diagonalisation of matrices .Reduction of a quadratic form to canonical form by orthogonal transformation and nature of quadratic forms.

UNIT – II	Trigonometry and Theory of Equations	Hours: 10

Trigonometry: Hyperbolic and circular functions, logarithms of complex number, resolving real and imaginary parts of a complex quantity.

Theory of equations: Relation between roots and coefficients, reciprocal equations, transformation of equations and diminishing the roots.

UNIT – III	Finite Differences	Hours: 09

Finite differences: Definitions and relation between operators (Δ, ∇, δ, E, μ, D), Solution of difference Equations, Solving Boundary value problems for ordinary differential equations using finite difference method.

UNIT – IV	Vector Analysis	Hours: 10

Gradient, divergence and curl, their properties and relations. Stoke's theorem and Gauss divergence theorem (without proof). Simple applications involving cubes, sphere and rectangular parallelepipeds.

UNIT – V	Statistics	Hours: 10

Moments, skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation.

Total contact Hours: 48	Total Tutorials: 12	Total Practical Classes: -	Total Hours: 60

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics (9th Ed), John Wiley & Sons, New Delhi, 2011.
2. Venkataraman M.K., Engineering Mathematics, Vol II&III, National Publishing Company, Chennai, 2011.
3. Kandasamy P. et al, Numerical Methods, S. Chand & Co., New Delhi, 2012.

Reference Books:

1. Grewal B. S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 41[st]Edition, 2011.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
3. Bali N. and Goyal M., Advanced Engineering Mathematics, Laxmi Publications Pvt. Ltd., New Delhi, 9th Edition, 2011.

Department : Physics					Programme : B.Tech.			
Semester : Two					Category : TA			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
PH102	Material Science	4	-	-	4	40	60	100
Prerequisite	-							
Objectives	• To impart knowledge to the Engineering students about the significance of Materials Science and its contribution to Engineering and Technology • To introduce the Physical concepts and properties of Different category of materials and their modern applications in day-to-day life.							
Outcome	• Engineering Students would have gained fundamental knowledge about the various types of materials and their applications to Engineering and Technology.							

UNIT – I	Dielectric Materials	Hours: 12

Dielectric Polarization and its Mechanisms – Calculation of Polarizabilities (for electronic and ionic polarizations only) - Temperature dependence of polarization-Internal Field in solids - Clausius-Mossotti relation.– Elementary ideas of Piezo-, Pyro- and Ferro-electric materials and Applications.
NLO materials and piezoelectric actuators (introductory concepts).

UNIT – II	Magnetic Materials and Superconductors	Hours: 12

Magnetic Materials : Origin of atomic magnetic moment – Bohr magneton-classification of magnetic materials (Dia, Para, Ferro, antiferro & Ferri) – Domain Theory of Hysteresis – Structure and Properties of Ferrites – Properties of Soft & Hard Magnetic Materials – Applications. Magnetic Hard Disk. Ferro-fluids and applications.
Superconductors: Basic concepts – properties of superconductors – Meissner effect – Type I and II superconductors – BCS theory (qualitative) - High Temperature Superconductors– Qualitative ideas of Josephson effect, quantum interference and SQUID – their applications.

UNIT – III	Semiconductors	Hours: 12

Semiconductors –Concept of Fermi Distribution Function, Fermi Energy Level- Derivation of Carrier concentration in intrinsic Semiconductors –Basic ideas of Electrical conductivity in intrinsic and extrinsic semiconductors -temperature dependence of carrier concentration and electrical conductivity in semiconductors (qualitative ideas), Hall effect in Semiconductors -- Application of Hall Effect. Basic Ideas of Compound Semiconductors (II-VI & III-V). Photovoltaic Effect-Solar photovoltaic cells.

UNIT – IV	Nuclear Reactors and Materials	Hours: 12

Mass Defect & Binding Energy of Nucleus - Disintegration in fission –Nuclear Reactors: BWR – FBR. Materials used in Nuclear Reactors; Materials for Moderator, coolant, reactor control elements containment shell. Nuclear Fuel materials and Fuel processing - Fuel enrichment.
 Nuclear fusion reactions for fusion reactors-D-D and D-T reactions, Basic principles of Nuclear Fusion reactors

UNIT – V	Smart Materials and Nanomaterials	Hours: 12

Smart Materials: Introduction –definitions.
Shape Memory alloys (SMA): One way and two way Shape memory effect, pseudoelasticity, Properties and applications of SMA- features of Ni-Ti SMA alloy.
Liquid Crystals : Types – nematic, cholesteric, smectic- Application to Display Devices
Metallic Glasses: preparation by melt spinning. properties and applications
Nanomaterials : Introduction to Nano materials–Methods of synthesis (CVD, Laser Ablation, Solgel, Ball-milling Techniques), Properties and applications of nanomaterials.
C_{60}-Buck Minister Fullerence, carbon nanotubes– synthesis (Plasma arc, Pulsed Laser evaporation methods) Properties and applications.

Total contact Hours: 60	Total Tutorials: -	Total Practical Classes: -	Total Hours: 60

Text Books:
1. Avadhanulu M N, Engineering Physics, Vol.-II, S. Chand & Co, 2009.
2. Arthur Beiser, Concepts of Modern Physics, 6th Edition, TMH, New Delhi 2008. (For Unit V only)

Reference Books:
1. V Rajendran, Engineering Physics, 2nd Edition, TMH, New Delhi 2011.
2. B.S. Murty, P. Shankar, Baldev Raj, B.B. Rath, and James Murday, Text book of Nanoscience and Nanotechnology, Universities Press, Hyderabad 2012.

3. Ali Omar M, Elementary Solid State Physics, Addison Wesley Publishing Co., 2009.
4. Pillai S.O, Solid State Physics, 6th Edition – New Age International, 2005.
5. Vijayamohanan K Pillai and Meera Parthasarathy, Functional Materials, Universities Press Hyderabad, 2012.
6. Science of Engineering Materials, 2nd Edition, C.M. Srivastava and C. Srinivasan, New Age Int. (P) Ltd, New Delhi, 1997.

Department : Chemistry				Programme : B.Tech.			
Semester : Two				Category : TA			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
CY102	Environmental Science	4	-	-	4	40	60	100
Prerequisite								
Objectives	• To widen the knowledge of environmental awareness and pollution • To educate the importance of preserving the earth's resources and ecosystem • To highlight the modern techniques and regulations to monitor and control pollution							
Outcome	• Students will be able to understand about the environment and natural resources we are blessed with. • Students will become aware of environmental issues like pollution, dwindling natural resources and degrading ecosystem. • Students will be inspired to act as environmentally friendly and work for sustainable development of the humanity.							

UNIT – I	Ecosystem and Biodiversity	Hours: 12

Concept of an ecosystem-structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of forest, grass land, desert and aquatic (fresh water, estuarine and marine) ecosystem. Biodiversity-definition-genetic, species and ecosystem diversity. Value of biodiversity–consumptive use, productive use, social, ethical, aesthetic and option values. Hot spots of biodiversity. Threats to biodiversity-habitat loss, poaching of wild life, human-wildlife conflicts. Wildlife protection act and Forest conservation act. Endangered and endemic species. Conservation of biodiversity-in-situ and ex-situ conservation of biodiversity.

UNIT – II	Air Pollution	Hours: 12

Environmental segments-lithosphere, hydrosphere, biosphere and atmosphere. Atmospheric layers. Pollution-definition and classification. Pollutants-classification. Causes, sources, effects and control measures of air pollutants-oxides of nitrogen, oxides of sulphur, oxides of carbon, hydrocarbon, chlorofluro carbons and particulates. Green house effect-causes and effects on global climate and consequences. Ozone depletion-causes, mechanism and effect on the environment. Smog-sulfurous and photochemical smog-effect on the environment. Acid rain-theory of acid rain and effects. Environmental protection act-air (prevention and control of pollution) act.

UNIT – III	Water and Land Pollution	Hours: 12

Water resources. Water pollution-causes and effects of organic water pollutants-pesticides and detergents. Causes and effects of inorganic water pollutants-heavy metal pollution due to Hg, Pb, Cr and Cu. Thermal pollution. Analysis of DO, BOD, COD and TOC. Water (prevention and control of pollution) act. Land pollution-Solid waste management-causes, effects and control measures of urban and industrial wastes. Radioactive pollution.

UNIT – IV	Instrumental Pollution Monitoring	Hours: 12

Classification of instrumental techniques. Electromagnetic radiations, properties, emission and absorption of radiation. Principle and Instrumentation of atomic absorption and emission spectrometry. Beer-Lamberts law. UV–visible spectrophotometry-Principle and instrumentation. IR spectroscopy - Principle and instrumentation. Chromatography–Introduction, Principle and Instrumentation of gas chromatography. Conductometry and potentiometry. Analysis of air pollutants-NOx, SOx and COx.

UNIT – V	Energy and Environment	Hours: 12

Energy resources-growing energy needs. Renewable and non-renewable energy resources and use of alternate-energy sources. Green Chemistry - Significance. Basic components of green chemistry – alternative starting materials, reagents, reaction conditions and final products. Atom economy. Industrial applications of green chemistry. From unsustainable to sustainable development. Role of an individual in prevention of pollution.

Total contact Hours: 60	Total Tutorials:	Total Practical Classes:	Total Hours: 60

Text Books:
1. Anubha Kaushik and C.P. Kaushik, Environmental Science and Engineering, New Age International (P) Ltd, New Delhi, 2009. (Unit I)
2. S.S. Dara, A Text Book of Environmental Chemistry and Pollution Control, S. Chand and Company Ltd, New Delhi, 2008. (Unit II, III, & V)
3. C.N. Sawyer, P.L. McCarty And G.F. Parkin, Chemistry for Environmental Engineering and Science, Tata

McGraw-Hill Publishing Co Ltd, New Delhi, 2004. (Unit IV)
Reference Books:
1. K. Raghavan Nambiar, Text Book of Environmental Studies, Scitech Publications India Pvt. Ltd, Chennai, 2008. 2. A.K. De, Environmental Chemistry, New Age International (P) Ltd, New Delhi, 2006. 3. B.K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut, 2001. 4. G.S. Sodhi, Fundamental Concepts of Environmental Chemistry, Narosa Publishing House, New Delhi, 2013.

Department :	Civil Engineering / Mechanical Engineering	Programme : B.Tech						
Semester	: One / Two	Category : TC						

Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
BE101	Basic Civil and Mechanical Engineering	4	-	-	4	40	60	100

Prerequisite	
Objectives	- To be able to differentiate the types of buildings according to national building code. - To understand building components and their functions as well as different types of roads, bridges and dams - To convey the basics of Mechanical Engineering - To establish the necessity of basics of Mechanical Engineering to other engineering disciplines - To explain the concepts of thermal plants used in power systems being a common issue - To narrate the methods of harnessing renewable energies and their working principles - To explain the role of basic manufacturing processes - To develop an intuitive understanding of underlying working principles of mechanical machines and systems.
Outcome	- Parallels are drawn between the subject and the student's everyday experience so that this course may be related to what the students already know. - Students are made to understand the principles of Mechanical Engineering based on theories. - Students are encouraged to make engineering judgments, to conduct independent exploration of topic of renewable energy systems and to communicate the findings in a professional manner. - Students are made to develop natural curiosity to explore the various facets of mechanical equipment and machines. - While emphasizing basic principles, students are provided with explanations used in real time engineering systems.

UNIT – I	Buildings and Building Materials	Hours: 10

Buildings-Definition-NBC Classification - plinth area, floor area, carpet area, floor space index-construction materials-stone, brick, cement, cement-mortar, concrete, steel- their properties and uses. Impact of manufacture and use of building materials on the environment.

UNIT – II	Buildings and their Components	Hours: 10

Buildings: Types and Behaviour. Foundation: Soil classification – functions and types of foundations. Masonry: Types and uses. Floors: Types and functions. Roofs-Types and functions. Concepts of green building.

UNIT – III	Basic Infrastructure	Hours: 10

Surveying-Types, general principles, uses, instruments used. Roads - Components, types and their merits and demerits. Bridges-components and types of bridges. Dams-Purpose, types of dams and its components. Water supply-sources and quality requirements. Rainwater harvesting.

UNIT – IV		Hours: 10

IC engines – Classification – Working principles - Diesel and petrol engines: two stroke and four stroke engines – Merits and demerits.
Steam generators (Boilers) – Classification – Constructional features (of only low pressure boilers) – Boiler mountings and accessories – Merits and demerits - Applications.

UNIT – V		Hours: 10

Power Generation Systems – Convectional and Non-Conventional:
Hydraulic – Thermal – Nuclear power plants – Schemes and layouts (Description Only) Solar – wind –Geothermal - Wave – Tidal and Ocean Thermal Energy Conversion systems – Basic power plant schemes and layouts (Description only).

UNIT – VI		Hours: 10

Machines: Lathe – Drilling machine – Grinding machine (Description only)
Machining Processes: Turning – Planning – Facing – Taper turning – Knurling – Chamfering – Drilling – Grinding
Moulding: Pattern making – Green and dry sand moulding – casting. Metal Joining – Arc and Gas welding – Brazing – Soldering (process description only).

Total contact Hours: 60	Total Tutorials: -	Total Practical Classes: -	Total Hours: 60

Text Books:

1. Natarajan, K V, Basic Civil Engineering, 11th Edition, Dhanalakshmi Publications, Chennai, 2011. (*For Units I to III*)
2. Lindberg, R.A.Process and Materials of Manufacture, PHI, 1999.
3. H.N.Gupta, R.C.Gupta and Arun Mittal, Manufacturing Processes, New Age Publications, 2001.
4. Nagpal, Power Plant Engineering, Khanna Publishers, Delhi, 1998.

Reference Books:

1. Purushothama Raj.P., Basic civil engineering, 3rd Edn., Dhanam Publications, Chennai, 2001.
2. Punmia, B.C., et.al Building Construction, Laxmi Publishers, New Delhi, 2012.
3. El.Wakil, M.M., Power Plant Technology, Mc Graw Hill Book Co., 1985.
4. Hajra Choudhry, et. al., Workshop Technology Vol. I and II, Media Promoters Publishers Pvt. Ltd., Bombay, 2004.

Web sites:

1. http://nptel.iitm.ac.in/courses/Webcourse-contents/
2. http://ocw.mit.edu/courses/mechanical-engineering/

Department : Civil Engineering				Programme : B.Tech.			
Semester : One / Two				Category : TB			
Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
CE101	Engineering Mechanics	3	1	-	4	40	60	100
Prerequisite	-							

Objectives	• To explain the importance of mechanics in the context of engineering. • To understand the static equilibrium of particles and rigid bodies in two dimensions • To introduce the techniques for analyzing the forces in the bodies. • To study the motion of a body and to write the dynamic equilibrium equation.
Outcome	• On successful completion of the course, a student would be able to identify and analyze the problems by applying the principles of engineering mechanics, and to proceed to advanced study on mechanical systems.

UNIT – I	Fundamentals of Mechanics	Hours: 09

Mechanics and its relevance, Force System, Definition- Force, Moment and Couple -Principle of Transmissibility, laws of mechanics, Resultant of force system – Concurrent and non-concurrent coplanar forces, Conditions of static equilibrium for coplanar force system, stability and equilibrium, concept of free body diagrams.

UNIT – II	Application of Force System	Hours: 09

Types loads and supports – simply supported beams, cantilever beams and plane trusses – reactions (Introduction only).
Friction: Laws of friction, Static dry friction, simple contact friction problems, body on inclined planes, ladders, wedges, simple screw jack.

UNIT – III	Properties of Surfaces	Hours: 09

Properties of sections – centroids, center of gravity, area moment of inertia, product moment of inertia, polar moment of inertia, radius of gyration, mass moment of inertia.
Principle of virtual work – work done – application to simple structural arrangements.

UNIT – IV	Kinematics and Kinetics of Particles	Hours: 09

Introduction of Dynamics – Types of Motion – D Alembert's principle – work energy method – work energy equation for translation and – Motion of connected bodies – work done by a spring – Impulse momentum equation – conservation of momentum – Impact of elastic bodies – oblique impart – Loss of kinetic energy.

UNIT – V	Kinematics and Kinetics of Rigid Bodies	Hours: 09

Circular Motion of Rigid bodies – Acceleration during circular motion – Rotation of rigid bodies – Angular motion – Relationship between Angular and linear motion – Kinetics of Rigid body rotation – General plane of motion – Kinematics – Instantaneous Axis of rotation – kinetics of Rolling bodies – Kinetics of General plane motion.

Total contact Hours: 45	Total Tutorials: 15	Total Practical Classes: -	Total Hours: 60

Text Books:

1. Bhavikatti,S.S and Rajashekarappa,K.G., Engineering Mechanics, New Age International (P) Ltd, New Delhi, 2013.

Reference Books:

1. Timoshenko, S., Young, D.H., Rao, J.V. and Sukumar Pati, Engineering Mechanics, Fifth edition, McGraw Hill Education (India) Pvt. Ltd., 2013.
2. Beer, F.P and Johnson Jr. E.R, Vector Mechanics for Engineers, Vol. 1 Statics and Vol. 2 Dynamics, McGraw – Hill International Edition, 1997.

Department : Humanities and Social Sciences			Programme : B.Tech.				
Semester : One /Two			Category : TA				
Subject Code	Subject		Hours / Week			Credit	Maximum Marks
			L	T	P	C	CA	SE	TM

Subject Code	Subject	L	T	P	C	CA	SE	TM
HS101	Communicative English	4	-	-	4	40	60	100

Prerequisite	-
Objectives	• To improve the LSRW skills of I. B.Tech students • To instill confidence and enable the students to communicate with ease • To equip the students with the necessary skills and develop their language prowess
Outcome	On successful completion of the module students should be able to: • communicate effectively in English • get rid of their inhibitions • possess effective language skills • improve their career prospects

UNIT – I	Basic Concepts of Communicative English	Hours: 12

Definition – Importance – Process – Channels and Types – Barriers – Strategies for Effective Communicative – Listening Skills.

UNIT – II	Comprehension and Analysis	Hours: 12

Comprehension of Technical and Non – Technical Passages – Skimming. Scanning, Inferring – Note-making, Predicting and responding to context –Intensive Reading and Reviewing.

UNIT – III	Writing	Hours: 12

Paragraph and Essay – Report – Memorandum – Instructions – Job Application Letters – Resume – E-Mail Writing.

UNIT – IV	Oral Communication	Hours: 12

Basics of Phonetics- Presentation Skills- Group Discussions –Extempore- Debates- Role Plays.

UNIT – V	Vocabulary and Language Through Literature	Hours: 12

Analysis of
1. "English in India", R.K. Narayan
2. "Toasted English", R.K. Narayan
3. "Politics and the English Language", George Orwell

Contextual variations of language – interpretation of literary language – vocabulary building – nuances of language (grammar, pronunciation, spelling) – developing critical framework.

Total contact Hours: 60	Total Tutorials: -	Total Practical Classes: -	Total Hours: 60

Text Books:
1. Ashraf M. Rizvi, Effective Technical Communication, New Delhi, Tata McGraw, 2005.
2. George Orwell, Essays, Penguin Books, 2000.
3. R.K.Narayan, A storyteller's World, Penguin Books, 1989.

Reference Books:
1. Daniel Jones. English Pronouncing Dictionary. Cambridge University Press, 2003.
2. Sanjay Kumar and Pushpalata. Communication Skills. New Delhi: OUP, 2011.
3. Nory Sankar Mukerjee. Business Communication: Connecting at Work. New Delhi: OUP, 2013.

Department : Physics				Programme : B.Tech.			
Semester : One / Two				Category : LB			
Subject Code	**Subject**	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
PH103	Physics Laboratory	-	-	3	2	60	40	100
Prerequisite	-							
Objectives	• To provide a practical understanding of some of the concepts learnt in the theory course on Physics and Materials Science.							
Outcome	• The Students would have gained practical experience about some of the Theoretical concepts learnt in the Physics and Materials Science courses.							

List of Experiments:

(Any 10 experiments including a maximum of 2 Demonstration experiments are to be performed.)

1. Radius of curvature of a Lens - Newton's rings
2. Thickness of a thin object by Air – wedge
3. Spectrometer – Resolving power of a Prism
4. Spectrometer – Resolving power of a Transmission grating
5. Determination of wavelength of a Laser source using transmission grating, reflection grating (vernier calipers) & particle size determination
6. Determination of numerical aperture & Acceptance angle of an optical fiber.
7. Laurent's Half shade polarimeter – Determination of specific rotatory power*
8. Spectrometer - Hollow prism / Ordinary & Extraordinary rays by Calcite Prism*
9. Determination of optical absorption coefficient of materials using laser*
10. Coefficient of Thermal conductivity - Radial flow method
11. Coefficient of Thermal conductivity – Lee's Disc method
12. Jolly's Bulb Apparatus experiment – determination of α
13. Magnetism: I – H curve
14. Field along the axis of a coil carrying current
15. Vibration magnetometer – calculation of magnetic moment & pole strength
16. Electrical conductivity of semiconductor – two probe / four probe method*
17. Hall effect in a semiconductor*
18. Michelson's Interferometer*

    *Demonstration Experiments.

Total contact Hours: -	Total Tutorials: -	Total Practical Classes: 45	Total Hours: 45

Reference Book:

1. Physics Practical Observation Manual Book issued by Dept. of Physics, Pondicherry Engineering College.

Department : Chemistry				Programme : B.Tech.			
Semester : One / Two				Category : LB			
Subject Code	**Subject**	**Hours / Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**SE**	**TM**
CY103	Chemistry Laboratory	-	-	3	2	60	40	100
Prerequisite	-							
Objectives	• To educate the principles involved in chemical analysis. • To provide practical knowledge of handling chemicals and chemical analysis. • To understand the importance of chemical analysis in various fields.							
Outcome	• Students will be able to understand chemical analysis and its usefulness in engineering, industry and other fields. • Students will gain laboratory skills and that will give confidence in analyzing samples in engineering, industry and other fields. • Students will gain knowledge about the principles and methods of listed methods of quantitative analyses.							

List of experiments: (Any 10 experiments)
1. Determination of total, permanent and temporary hardness of water by EDTA method.
2. Determination of magnesium in water by complexometry.
3. Determination of calcium in lime stone by complexometry.
4. Determination of alkalinity of water.
5. Determination of percentage of acetic acid in vinegar.
6. Determination of ferrous ion in Mohr's salt.
7. Determination of lead dioxide by permanganometry.
8. Determination of ferrous and ferric ions in a solution by dichrometry.
9. Determination of iron by spectrophotometry.
10. Determination of dissolved oxygen in water.
11. Determination of COD of water sample.
12. Determination of available chlorine in bleaching powder.
13. Determination of chloride content in water by argentometry.
14. Determination of lead in polluted water by conductometry.
15. Preparation of potash alum from scrap aluminium.

Total contact Hours: -	Total Tutorials: -	Total Practical Classes: 45	Total Hours: 45

Text Books:

1. Lab Manual, Department of Chemistry, Pondicherry Engineering College, Puducherry, 2014.

Reference Books:

1. V. Venkateswaran, R. Veeraswamy and A.R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand & Sons, New Delhi, 2001.
2. J. Mendham, R.C. Denney, J.D. Barnes and M. Thomas, Vogel's Text Book of Quantitative Chemical Analysis, Pearson Education, New Delhi, 2002.

Department : Mechanical Engineering		Programme : B.Tech.			
Semester : One / Two		Category : LB			

Subject Code	Subject	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
ME103	Workshop Practice	-	-	3	2	60	40	100

Prerequisite	-
Objectives	• To convey the basics of mechanical tools used in engineering • To establish hands on experience on the working tools • To develop basic joints and fittings using the hand tools • To establish the importance of joints and fitting in engineering applications • To explain the role of basic workshop in engineering • To develop an intuitive understanding of underlying physical mechanism used in mechanical machines.
Outcome	• Parallels are drawn between the subject and the student's everyday experience so that this course may be related to what the students already know. • Students are introduced to basic hand tools used in various mechanical cutting operations. • Students are encouraged to make simple joints and fittings. • Students are made to develop natural curiosity to explore the various facets of basic cutting operations. • While emphasizing basic operations, students are provided with modern hand tools to use in real time engineering jobs. • Students are exposed to make objects like tray, welded joints.

UNIT – I	Fitting	Hours: 11

1. Study of tools and Machineries
2. Symmetric fitting
3. Acute angle fitting
4. Obtuse angle fitting

UNIT – II	Welding	Hours: 11

1. Study of arc and gas welding equipment and tools
2. Simple lap welding (Arc)
3. Single V butt welding (Arc)
4. Corner joint (Arc)

UNIT – III	Sheet Metal	Hours: 11

1. Study of tools and machineries
2. Funnel
3. Waste collection tray
4. Rectangular Box

UNIT – IV	Carpentry	Hours: 12

1. Study of tools and machineries
2. Half lap joint
3. Corner mortise joint
4. Dovetail joint

Total contact Hours: -	Total Tutorials: -	Total Practical Classes: 45	Total Hours: 45

Text Books:

1. Hajra Choudhry, et al., Workshop Technology Vol. I and II, Media Promoters Publ. Pvt. Ltd., Bombay, 2004.
2. H.N.Gupta, R.C.Gupta and Arun Mittal, Manufacturing Processes, New Age Publications, 2001.

Web sites:

1. http://en.wikipedia.org/wiki/Category:Carpentry_tools
2. http://en.wikipedia.org/wiki/Welding