



CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (CSE, ECE and IT)

II – Semester						
S.No	Code	Subject	L	T	P/D	Credits
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
TOTAL			18	01	09	24

L - Lecture (clock hours) T - Tutorial (clock hours) P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

16 MT C02**ENGINEERING MATHEMATICS – II**

Instruction	3L Periods per week + 1 (extra hour)
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:

1. To know the relevant methods to solve higher order differential equations.
2. To learn the Laplace and Inverse Laplace transforms for solving engineering problems.
3. To know improper integrals such as Beta, Gamma functions.
4. To learn Vector Differential Operator and its physical interpretations.
5. To evaluate vector line, surface & volume integrals.
6. Learn to apply all the above mathematical methods/techniques to interpret the results in physical and technical terms.

Course Outcomes:

1. Solve the solutions of Differential Equations which arise in electrical circuits, vibrations and other linear systems.
2. Able to solve solutions of differential equations with initial and boundary value problems.
3. Evaluating definite integrals using Beta, Gamma functions.
4. Understating the significance of gradient, divergent and Curl.
5. Use Greens, Gauss and Stoke's theorems to find the surface and volume integrals.
6. Able to solve and analyse the Engineering problems.

UNIT-I Ordinary differential Equations: Linear Differential equations of higher order with constant coefficients, complementary function and particular integrals when RHS is of the forms e^{ax} , $\sin ax$, $\cos ax$, x^m , $e^{ax}(v)$, $x^m(v)$, where v-is a function of x, Cauchy's equation, electrical circuits of second order

UNIT-II Laplace Transforms: Laplace transforms of standard functions, Laplace transforms of piecewise continuous functions, first shifting theorem, multiplication by 't', division by 't'. Laplace transforms of derivatives and integrals of functions-Unit step function- Periodic functions (without proofs). Inverse Laplace transforms-by partial fractions (Heaviside method), Convolution Theorem, Solving Ordinary differential equations by Laplace Transforms

UNIT-III Beta and Gamma Functions: Definitions of Beta and Gamma functions-elementary Properties of both Beta and Gamma functions, Relation between Beta and gamma functions, differentiation under the integral sign.

UNIT-IV Vector Differentiation: Scalar and vector fields- directional derivative- Gradient of a scalar-Divergence and Curl of a vector point function. Properties of divergence, curl, Solenoidal and Irrotational vectors

UNIT-V Vector Integration: Evaluation of Vector Line integrals, surface integrals and volume integrals, Greens, Gauss divergence and Stokes theorems (without proofs) and its applications

Text Books:

1. Erwin Kreyszig "Advanced Engineering Mathematics," 10th edition, John Wiley & Sons -Publishers.
2. R.K.Jain & S.R.K.Iyenger "Advanced Engineering Mathematics" , 3rd edition, Narosa Publications
3. Alen Jaffery "Mathematics for Engineers & Scientists" , 6thed 2013 CRC press, Taylor & Francis Group. (Elsevier)
4. Dr.B.S.Grewal "Higher Engineering Mathematics", 43rd edition, Khanna Publishers.

Suggested Reading: (for further reading and examples on applications)

1. A.Craft and Robert Davison "Mathematics for Engineers-a modern interactive approach" -Wiley
2. Loius Pipes "Applied Mathematics and physicists" Mc Graw Hill publishers.
3. Kanti.B.Datta "Mathematical Methods of Science & Engg," Aided with MATLAB,. Cengage Learning India Pvt.Ltd.
4. AR Collar and A. Simpson "Matrices for Engineering Dynamics" -John Willey & sons.

16CY C01**ENGINEERING CHEMISTRY**

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:

The syllabus has sought to fulfil the objective of making the student of engineering and technology realize that chemistry is the real base of his profession and that therefore he must have a good understanding of chemistry before he can use it in his profession.

“the study of chemistry is profitable not only in as much as it promotes the material interest of mankind, but also because it furnishes us with insight into the wonders of creation, which immediately surround us and with which our existence, life and development, are most closely connected.” ----- Justus Von Leibig (German Chemist)

The various units of the syllabus is so designed to fulfil the following objectives.

1. This syllabus helps at providing the necessary introduction of the chemical principles involved and devices in a comprehensive manner understandable to the students aspiring to become practicing engineers.
2. The aim of framing the syllabus is to impart intensive and extensive knowledge of the subject so that students can understand the role of chemistry in the field of engineering.
3. Thermodynamics and Electrochemistry units give conceptual knowledge about spontaneous processes and how can they be harnessed for producing electrical energy and efficiency of systems.
4. Fuels have been taught with a view to give awareness as to materials which can be used as sources of energy
5. To understand importance of analytical instrumentation for different chemical analysis.

Course Outcomes:

1. This syllabus gives necessary theoretical aspects required for understanding intricacies of the subject and also gives sufficient exposure to the chemistry aspects in different disciplines of engineering
2. The above knowledge also helps students to carry out inter disciplinary research such that the findings benefit the common man.
3. This syllabus imparts a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

UNIT – I

Chemical Thermodynamics: Introduction and definition of the terms, the concept of reversible and irreversible processes, Work done in isothermal and adiabatic processes, Success and limitations of First law of thermodynamics, need for second law of thermodynamics, statements of second law of thermodynamics, Carnot cycle, heat engine and its efficiency, Carnot theorem, concept of Entropy - Entropy changes in reversible and irreversible processes, physical significance of entropy criteria of spontaneity in terms of entropy and Gibb's free energy function, Gibb's-Helmholtz equation and applications, Numericals.

UNIT – II**Phase rule & Chemical Equilibria**

Phase rule : Statement, definition of the terms - phases, components, degrees of freedom with examples, Phase diagram - one component system (water system), two component system (silver-lead system), desilverisation of lead.

Chemical Equilibria - Homogenous and Heterogenous Equilibria - applications

UNIT – III

Fuels: Classification, requirements of a good fuel, calorific value, types of calorific value, calculation of CV using Dulong's formula, Combustion - calculation of air quantities by weight and volume, Numericals.

Solid fuels: coal - analysis of coal – proximate and ultimate analysis - importance.

Liquid fuels - crude oil - fractional distillation, cracking - Fixed bed catalytic cracking, knocking, antiknocking agents (TEL, MTBE), octane number, cetane number, unleaded petrol.

Gaseous fuels - LPG, CNG - composition and uses

UNIT – IV

Electrochemistry Introduction, construction of electrochemical cell, sign convention, cell notation, cell emf, SOP and SRP, electrochemical series and its applications, Nernst equation and applications, Types of Electrodes - Standard Hydrogen Electrode, Saturated Calomel Electrode, Quinhydrone electrode and Ion selective electrode (Glass electrode), construction, Numericals

UNIT – V

Instrumental Techniques in Chemical Analysis: Principle, method and applications of Conductometry (acid-base titration), Potentiometry (acid-base, redox titration), pH- metry (acid – base titration), Colorimetry (Beer Lambert's law)

Green Chemistry - outlines and Principles**Text Books:**

1. P.C.Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub, Co., New Delhi (2002)
2. Puri & Sharma, "Principles of Physical Chemistry
3. S.S.Dara & S.S.Umare, "Engineering Chemistry", S.Chand company
4. J.C. Kuriacase & J. Rajaram, "Chemistry in engineering and Technology", Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).
5. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).
6. P.R.Vijayasarathi, "Engineering Chemistry" PHI Learning Private Limited, New Delhi (2011)

Suggested Reading:

1. Physical chemistry by P.W.Atkin (ELBS OXFORD PRESS)
2. Physical chemistry by W.J.Moore (Orient Longman)
3. Physical Chemistry by Glasstone
4. Physical Chemistry by T.Engel & Philip Reid, Pearson Publication.
5. B.K.Sharma "Engineering chemistry" Krishna Prakasan Media (P) Ltd.,Meerut (2001).

16PY C02**APPLIED PHYSICS**

Instruction	2L Periods per week
Duration of End Examination	2 Hours
End Examination	50 Marks
Sessional	20 Marks
Credits	2

Course Objectives: The objectives of the course is to make the student

1. Learn the concepts of modern physics
2. Gain knowledge of wave mechanics and statistical mechanics
3. Know the different kinds of materials and their characterization techniques

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

1. Understand the advances in laser physics, holography, optical fibers and apply them in engineering & technology
2. Explain the importance of wave mechanics and band theory of solids
3. Analyze and apply distributions of statistical mechanics for problem solving
4. Identify the materials with semiconducting and superconducting properties for engineering applications
5. Understand the role of novel materials and their characterization techniques in engineering and technology

UNIT – I Lasers & Holography: Characteristics of lasers – Spontaneous & stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – He-Ne laser – Semiconductor laser – Applications. Basic principle of Holography – Recording & Reconstruction of hologram – Applications

Optical Fibers: Principle and Construction – Propagation of light through an optical fibre – Acceptance angle – Numerical aperture – Pulse dispersion – Classification of optical fibers: Single mode & Multi mode and Step-index & Graded-index optical fibers – Double crucible method – Applications.

UNIT – II Wave Mechanics: Schrödinger time independent and time dependent wave equations – Physical significance of wave function – Infinite square well potential (particle in a box) – Potential barrier – Tunneling effect .

Band Theory of Solids: Origin of energy band formation – Electron in periodic potential – Kronig-Penny model (qualitative) – Classification of solids

UNIT – III Elements of Statistical Mechanics: Maxwell-Boltzmann statistics – Bose-Einstein statistics – Fermi-Dirac statistics – Photon gas – Planck's law of black body radiation – Wien's law and Rayleigh-Jean's law from Planck's law – Concept of electron gas (qualitative) – Fermi energy level.

UNIT – IV Semiconductors: Intrinsic and extrinsic semiconductors – Carrier concentration in intrinsic semiconductors – Energy gap – Hall Effect – Construction & working of solar cell.

Superconductors: General properties of superconductors – Meissner's effect – Type I and Type II superconductors – BCS theory (qualitative) – Applications.

UNIT – V Nanomaterials: Properties of materials at reduced size – Surface to volume ratio – Quantum confinement –Preparation of nanomaterials: Bottom-up approach (Sol-gel method) & Top-down approach (Ball milling method) – Elementary ideas of carbon nanotubes – Applications of nanomaterials.

Techniques for Characterization of Materials: X-ray fluorescence – Auger (OJ) process – Scanning electron microscope (SEM) – Tunneling electron microscope (TEM) – Atomic force microscope (AFM).

Text Books:

1. B.K. Pandey and S. Chaturvedi, "Engineering Physics", Cengage Publications, 2012.
2. M.N. Avadhanulu and P.G. Kshirsagar, "A Text Book Engineering Physics", S. Chand Publications, 2014.
3. Satya Prakash, "Statistical Mechanics", Kedar Nath Ram Nath Publications, 2008.
4. S.L. Gupta and Sanjeev Gupta, "Modern Engineering Physics", Dhanpat Rai Publications, 2011.

Suggested Reading:

1. R. Murugesan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand Publications S. Chand Publications, 2014.
2. M. Arumugam, "Materials Science", Anuradha Publications, 2015.
3. P.K. Palanisamy, "Engineering Physics", Scitech Publications, 2012.
4. Hitendra K Malik and A.K. Singh, "Engineering Physics", Tata McGraw Hill Education Publications, 2011

16CS C01**PROGRAMMING AND PROBLEM SOLVING**

Instruction	3L + 1T Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	4

Course Objectives:

1. To acquire problem solving Skills.
2. To be able to write Algorithms.
3. To understand structured programming Approach.
4. To understand Memory structure.
5. To implement I/O Programming.
6. To be able to write program in C Language.

Course Outcomes: Student will be able to:

1. Develop algorithms for scientific problems.
2. Explore algorithmic approaches to problem solving.
3. Understand the components of computing systems.
4. Choose data types and structure to solve mathematical problem.
5. Develop modular programs using control structure, arrays and structures.
6. Write programs to solve real world problems using structured features.

UNIT – I

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flow charts.

Introduction to C Language: Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output Statements Arithmetic Operators and Expressions: Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.

UNIT – II

Control Statements: Bitwise Operators, Relational and Logical Operators, If, If-Else, Switch-Statement and Examples. Loop Control Statements: For, While, Do-While and Examples. Continue, Break and goto statements.

Functions: Function Basics, User-defined Functions, Inter Function Communication, Standard Functions, Parameter Passing-Call-by-value, call-by-reference, Recursion.

UNIT – III

Storage Classes: Auto, Register, Static, Extern, Scope Rules, and Type Qualifiers.

Arrays: Concepts, Using Arrays in C, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays.

Searching and Sorting: Linear and Binary Search, Selection Sort and Bubble Sort.

UNIT – IV

Pointers: Introduction, Pointers to Pointers, Compatibility, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command-line Arguments.

Strings: Concepts, String Input /Output Functions, Arrays of Strings, String Manipulation Functions.

UNIT – V

Structures: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Unions, Type Definition (typedef), Enumerated Types.

Input and Output: Introduction to Files, Modes of Files, Streams, Standard Library Input/output Functions, Character Input/output Functions

Preprocessors: Preprocessor Commands

Text Books:

1. Pradip Dey and Manas Ghosh "Programming in C 2/e" Oxford University Press , 2nd Edition 2011.
2. B. W. Kernighan and D.M. Ritchie, "The 'C' Programming Language" Prentice Hall India, 2nd Edition. 1990.
3. B.A.Forouzan and R.F. Gilberg A Structured Programming Approach in C, Cengage Learning, 2007.

Suggested Reading:

1. Rajaraman V. "The Fundamentals of Computers" 4th Edition, Prentice Hall of India, 2006.
2. R S Bichker "programming in c" University Press , 2012.

16ME C01**ELEMENTS OF MECHANICAL ENGINEERING**

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:

1. Student will understand different types of engineering materials and their applications.
2. Student will come to know working principles of Petrol & Diesel engines with basic knowledge of thermodynamics.
3. Student will understand various making processes.
4. Student will come to know various power transmission devices.
5. Student will understand the importance of principles of management in industry.
6. Student will come to know aspects of various quality control techniques.

Course Outcomes: At the end of the course, students will be able to

1. Select the material depending upon requirement.
2. Evaluate performance of Petrol & Diesel engines.
3. Demonstrate his/her knowledge in preparing process chart for various machining operations.
4. Estimate the power required for various power transmitting devices like belt and gear trains.
5. Become a successful entrepreneur after studying principles of management.
6. Apply various quality control techniques after studying principles of industrial engineering.

UNIT – I Engineering Materials: Metals and their alloys, Ductile and brittle materials, Ceramics, Polymers, Composite materials
Simple Stresses & Strains: Stress-strain diagram (for ductile and brittle materials), Poisson's ratio, Young's Modulus, Rigidity modulus, Bulk modulus, Failure theories, factor of safety.

UNIT – II Thermodynamics: Zeroth, First, Second and Third laws of thermodynamics and corollaries

I.C. Engines: Working principle of Two stroke and Four stroke SI and CI engines, Calculations of efficiencies

Heat Transfer: Fourier law of conduction in single coordinates, Newton's law of conduction, Stephens & Boltzmann law of radiation

UNIT – III Basic Manufacturing Processes: Introduction to Welding, Brazing & Soldering, Principles of gas welding & arc welding processes, Casting, Principles of sand casting and die casting, Principles of Turning, Drilling, Milling, Grinding, Knurling, Tapping and Honing operations

UNIT – IV Kinematics: Definitions of kinematic link, pair, mechanism and machine

Gear Trains: Simple, Compound, Inverted and Epicyclic gear trains

Belt Drives: Open and crossed belt drives, length of belts, ratio of belt tensions for flat belt, condition for maximum power transmission for flat belt

Fluid Mechanics: Definition and basic properties of fluids, types of fluids and fluid flows, stream lines, streak lines, stream function and velocity potential

UNIT – V Industrial Engineering & Management: Introduction to scientific management, basics and importance of work study, steps in conducting work study, time study, standard time, organization and types of organization, Quality definition and its importance, introduction to quality control, types of inspection.

Text Books:

1. Jonathan Wickert and Kemper E. Lewis, An Introduction to Mechanical Engineering, 3rd Ed, Cengage learning, USA, 2013
2. Yunus A. Cengel, Heat Transfer: A Practical Approach, Mcgraw-Hill, 2nd edition, 2002
3. Mahesh M Rathore, Thermal Engineering, Tata Mc Grw Hill Education Pvt. Ltd., 2010

Suggested Reading:

1. R K Rajput, Thermal Engineering, Laxmi Publications, 2010
2. Michael Geoffrey Stevenson, Industrial Engineering, University of N.S.W., Division of Postgraduate Extension Studies, 1972
3. PN Rao, Manufacturing Technology, Volume-I, 3rd Edition, Tata McGraw-Hill, Education, 2009
4. Thomas Bevan, Theory of Machines, 3rd Edition, Pearson Education India, 1986
5. P. N. Modi, S. M. Seth, Hydraulics and Fluid Mechanics: Including Hydraulic Machines, Standard Book House, 2011

16EC C01**ELEMENTS OF ELECTRONICS AND COMMUNICATION ENGINEERING**

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:

1. To understand the elementary concepts of electronic devices.
2. To study basics of Boolean algebra and working of digital circuits.
3. To understand basic operations of AM, FM, filters and multiplexing .
4. To enable the students to understand the working of commonly used communication systems.
5. To give an exposure to the selected applications.

Course Outcomes: The students will be able to

1. Familiar with the basic electronic devices and simple circuits
2. Work with Boolean algebra principles, build the simple combinational and sequential circuits
3. Appreciate the need for modulation, filtering and multiplexing
4. Understand the working principles of a few communication systems
5. Familiar to the selected applications

UNIT – I**Basics of Passive and Active Devices**

Classification of passive and active devices and their symbols; current flow in a semiconductor; Operating principle of a diode, its application as a rectifier; Operating principle of a transistor (BJT and JFET), Principle and use of Zener diode, Photo diode and LED.

UNIT-II**Introduction to Digital Electronics**

Number systems, Binary addition and subtraction, ASCII code, Boolean algebra (Theorems and properties), Logic gates, Combinational circuits such as Half adder, Full adder and Half subtractor, Introduction to sequential logic, Basic Flip flop, Evolution of ICs, block diagram description of Microprocessor and Microcontroller.

UNIT – III**Principles of Communication Engineering (Elementary treatment only)**

Basic Communication system components; Concept of Modulation, Introduction to AM, FM and comparisons; Introduction to wired and wireless communication; Concepts of filtering, LPF, HPF, BPF and BSF; concept of multiplexing, TDM and FDM.

UNIT-IV**Overview of Communication Systems**

Radio spectrum and applications, Modes of propagation;
Basic cellular network and concepts of a cell, frequency reuse, hand-off and cross-talk;
Basic Radar block diagram and applications; Introduction to communication satellite, Geostationary satellites and subsystems, Applications of satellites, GPS, DTH, Remote Sensing;

UNIT –V**Basic operating principles of selected applications:**

Block diagram of CRO and application; Software Defined Radio (SDR)-Definition and it's block diagram; Smart phone-features; Introduction to Wireless sensor networks (Bluetooth and ZigBee), RFID-and its types, basic functions; Introduction to Modem.

Text Books:

1. "Electronic Principles" by Albert Malvino and David J Bates, 7th Edition, 2006
2. "Digital Principles and Applications", by Donald P Leach, Albert Paul Malvino, Gautham saha, Tata McGraw Hill, 6th Edition, 2009
3. "Electronic Communication Systems", by Kennedy and Davis, Tata Megra Hill Publications, 4th Edition, 2008

16CE C03**PROFESSIONAL ETHICS AND HUMAN VALUES**

Instruction	1L Periods per week
Duration of End Examination	2 Hours
End Examination	50 Marks
Sessional	- - -
Credits	1

Course Objectives:

1. To develop the critical ability among students to distinguish between what is of value and what is superficial in life
2. To enable the students, understand the values, the need for value adoption and prepare them meet the challenges
3. To enable the students, develop the potential to adopt values, develop a good character and personality and lead a happy life
4. To motivate the students, practice the values in life and contribute for the society around them and for the development of the institutions /organisation around they are in.
5. To make the students understand the professional ethics and their applications to engineering profession

Course Outcomes:

1. Students develop the capability of shaping themselves into outstanding personalities, through a value based life.
2. Students turn themselves into champions of their lives.
3. Students take things positively, convert everything into happiness and contribute for the happiness of others.
4. Students become potential sources for contributing to the development of the society around them and institutions/ organisations they work in.
5. Students shape themselves into valuable professionals, follow professional ethics and are able to solve their ethical dilemmas.

UNIT-I Concepts and Classification of Values –Need and challenges for value Adoption -Definition of Values – Concept of Values – Classification of Values – Hierarchy of Values – Types of Values – Interdependence of Values
Need for value education – Lack of education in values – Benefits of value education- Challenges for Value adoption – Cultural, Social, Religious, Intellectual and Personal challenges

UNIT – II: Personal Development and Values in Life

Personal Development: – Accountability and responsibility – Desires and weaknesses – Character development – Good relationships, self-restraint, Spirituality and Purity - Integrating values in everyday life

UNIT – III: Practicing Values for the development of Society

Resentment Management and Self-analysis – Positive Thinking and Emotional Maturity – The importance of Women , Children and Taking care of them – Helping the poor and needy – Fighting against addictions and atrocities – Working for the Sustainable development of the society
Principles of Integrity-Institutional Development - Vision for better India.

UNIT – IV: Basic Concepts of Professional Ethics

Ethics, Morals and Human life , Types of Ethics, Personal Ethics, Professional Ethics, Ethical dilemmas, Science – Religion - Ethics, Case Studies on Professional Ethics, Exemplary life sketches of prominent Indian personalities like Sri.M.Visweshwarayya, Dr.APJ Abdul Kalam and JRD Tata

UNIT-V: Ethics in Engineering Profession

Engineering Profession-Technology and Society- Ethical obligations of Engineering Professionals-Role and responsibility of Engineers - A few Case Studies on Risk management safety and Risk Management
Plagiarism-Self plagiarism- -Ethics Standards and Bench Marking

Text Books:

1. Subramanian R, “ Professional Ethics “ , Oxford University Press , 2013
2. Nagarajan R S, “ A Text Book on Human Values and Professional Ethics “ New Age Publications , 2007
3. Dinesh Babu S, “ Professional Ethics and Human Values “ , Laxmi Publications , 2007

Suggested Reading:

1. SantoshAjmera and Nanda Kishore Reddy , “Ethics , Integrity and Aptitude”,McGrawhill Education Private Limited, 2014
2. Govinda Rajan M, Natarajan S, Senthil Kumar V S, “Professional Ethics and Human Values”, Prentice Hall India, Private Limited,2012
3. Course Material for Post Graduate Diploma In “Value Education & Spirituality” Prepared by Annamalai University in Collaboration with Brahma Kumaris, 2010

16CS C02**PROGRAMMING LABORATORY**

Instruction	2P	Periods per week
Duration of End Examination	2	Hours
End Examination	35	Marks
Sessional	15	Marks
Credits	1	

1. Demonstration of control structures.
2. Demonstration of switch case (menu driven).
3. Demonstration of Parameter passing Methods.
4. Demonstration of Functions using Recursion.
5. Demonstration of arrays Operations on Matrix.
6. Implementation of bubble sort.
7. Implementation of selection sort.
8. Implementation of Linear and Binary Search.
9. Implementation of string manipulation operations with and without library function.
10. Demonstration using Pointers.
11. Demonstration of Array of Structures.
12. Sequential file operations.

Text Books:

1. Pradip Dey and Manas Ghosh "Programming in C 2/e" Oxford University Press , 2nd Edition 2011.
2. B. W. Kernighan and D.M. Ritchie, "The 'C' Programming Language" Prentice Hall India, 2nd Edition. 1990.

16ME C03**MECHANICAL AND IT WORKSHOP**

Instruction	3P Periods per week
Duration of End Examination	3 Hours
End Examination	50 Marks
Sessional	25 Marks
Credits	2

Mechanical Workshop**Trades for Practice 1. Fitting 2. Tin Smithy 3. Carpentry 4. House Wiring Exercises in Fitting**

1. To make a perfect rectangular MS flat
2. To do parallel cuts using Hack saw
3. To drill a hole and tap it
4. To make male and female fitting using MS flats-Assembly1
5. To make male and female fitting using MS flats-Assembly2

Exercises in Tin smithy

1. To make a square tray from the given sheet metal.
2. To make a rectangular box from the given sheet metal with base and top open. Solder the corners.
3. To make a scoop.
4. To make a dust pan from the given sheet metal.
5. To make a pamphlet box.

Exercises in Carpentry

1. To plane the given wooden piece to required size
2. To make a cross lap joint on the given wooden piece according to the given dimensions.
3. To make a Tee lap joint on the given wooden piece according to the given dimensions.
4. To make a dove tail-joint on the given wooden piece according to the given dimensions.
5. To make a bridle joint on the given wooden piece according to the given dimensions.

Exercises in House Wiring

1. Wiring of one light point controlled by one single pole switch, a three pin socket controlled by a single pole switch, and wiring of one buzzer controlled by a bell push.
2. Wiring of two light points connected in series and controlled by single pole switch. Verify the above circuit with different bulbs.
3. Wiring of two light points connected in parallel from two single pole switches and a three pin socket
4. Stair case wiring-wiring of one light point controlled from two different places independently using two 2-way switches.
5. Go-down wiring.

Demonstration of plumbing and welding trades

Note: *A minimum of 12 exercises from the above need to be done*

Suggested Reading:

1. Workshop Technology -- Hazra chowdary

IT Workshop**List of Tasks:**

Task 1: MS Word: Formatting text, inserting images, tables, equations and hyperlinks

Document Management: Page layout techniques and printing

Task 2: MS Excel: Functions and formulas and graph plotting

Task 3: MS Power point presentation: Guidelines for effective presentation, inserting objects, charts, hyperlinks and navigation between slides

Task 4: Essentials Search Engines & Net etiquette, Plagiarism, Open source tools and other utility tools

Suggested Reading:

1. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008.
2. The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech

16PY C04**APPLIED PHYSICS LABORATORY**

Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives: The objectives of the course is to make the student

1. Acquire knowledge in experiments of modern physics
2. Understand the characteristics of various semiconductor devices
3. Work with lasers and optical fibers

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

1. Understand the various applications of semiconductor devices and their suitability in engineering
2. Demonstrate the working of lasers and optical fibers and their applications in the field of communication
3. Analyze the electrical properties of a given solid based on its energy band gap
4. Verify the resistance and thermoelectric power properties with temperature variation
5. Demonstrate the concept of electron and its charge experimentally

List of Experiments:

1. Planck's Constant – Determination of Planck's Constant using photo cell
2. Solar Cell – Study of I-V characteristics of given solar cell and calculation of fill factor, efficiency and series resistance
3. Hall Effect– Determination of Hall coefficient, carrier concentration & mobility of charge carriers of given semiconductor specimen
4. P-N Junction Diode – Study of V-I characteristics and calculation of resistance of given diode in forward and reverse bias
5. Laser – Determination of wavelength of given semiconductor red laser
6. Fibre Optics – Determination of NA and power losses of given optical fibre
7. Energy Gap – Determination of energy gap of given semiconductor
8. Thermistor – Determination of temperature coefficient of resistance of given thermistor
9. e/m of Electron by Thomson's Method
10. Thermoelectric Power – Determination of thermoelectric power of given sample

Note: A student must perform a minimum of eight experiments.

Suggested Reading:

1. "Applied Physics"- Manual by Department of Physics, CBIT, 2016
2. S.K. Gupta, "Engineering Physics Practical", Krishna's Educational Publishers, 2014
3. O.P. Singh, V. Kumar and R.P. Singh, "Engineering Physics Practical Manual", Ram Prasad & Sons Publications, 2009

16CY C03**ENGINEERING CHEMISTRY LABORATORY**

Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives:

1. To impart fundamental knowledge in handling the equipment / glassware and chemicals in chemistry laboratory
2. For practical understanding of theoretical concept of chemistry

Course Outcomes:

1. This syllabus helps the student to understand importance of analytical instrumentation for different chemical analysis.
2. The above knowledge also helps students to carry out inter disciplinary research such that the findings benefit the common man.

List of Experiments:

1. Introduction to chemical analysis.
2. Preparation of standard solution of oxalic acid and Standardization of NaOH
3. Estimation of amount of Fe^{+2} in the given solution using Mohr's salt and KMnO_4
4. Estimation of amount of Fe^{+2} in the given solution using Mohr's salt and $\text{K}_2\text{Cr}_2\text{O}_7$
5. Estimation of amount of copper in the given solution using hypo solution.
6. Estimation of amount of HCl pH metrically using NaOH solution
7. Estimation of amount of CH_3COOH pH metrically using NaOH solution
8. Determination of concentration of given KMnO_4 solution Colorimetrically
9. Determination of concentration of given $\text{K}_2\text{Cr}_2\text{O}_7$ solution Colorimetrically
10. Distribution of acetic acid between n-butanol and water.
11. Distribution of benzoic acid between benzene and water
12. Preparation of urea – formaldehyde / phenol- formaldehyde resin.

Suggested Reading:

1. Vogel' S text book of quantitative chemical analysis by J. Mendham and Thomas, Person education Pvt.Ltd New Delhi ,6th ed. 2002
2. Laboratory Manual on Engineering Chemistry by Dr. Subdharani (Dhanpat Rai Publishing
3. A Textbook on experiment and calculation in engineering chemistry by S.S. Dara S.Chand
4. Instrumental methods of Chemical Analysis, MERITT & WILLARD East-West Press