

**VINAYAKA MISSION'S RESEARCH FOUNDATION,
SALEM (Deemed to be University)**

TAMILNADU, INDIA.



FACULTY OF ENGINEERING & TECHNOLOGY

SCHOOL OF ELECTRONIC SCIENCES

B.E- MECHATRONICS ENGINEERING

FULL TIME

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOR

&

V.M.K.V. ENGINEERING COLLEGE, SALEM

CHOICE BASED CREDIT SYSTEM

2016 REGULATION

(Semester I & II)

I SEMESTER

S.No.	Course Title	Offering Department	L	T	P	C
THEORY						
1	English for Engineers	ENGLISH	3	0	0	3
2	Physics for Engineers	PHYSICS	3	0	0	3
3	Calculus for Engineers	MATHS	3	1	0	4
4	Essentials of Computer Science and Engineering.	CSE	3	0	0	3
5	Essentials of Civil and Mechanical Engineering	CIVIL / MECH	3	0	0	3
PRACTICAL						
6	Physics Lab	PHY	0	0	3	2
7	Workshop Practices	MECH	0	0	3	2
8	Computer Lab	CSE	0	0	3	2
9	Yoga & Meditation	GEN	0	0	2	2
TOTAL						24

II SEMESTER

S.No.	Course Title	Offering Department	L	T	P	C
THEORY						
1	Business English	ENGLISH	3	0	0	3
2	Chemistry for Engineers	CHEM	3	0	0	3
3	Transforms & Matrices	MATHS	3	1	0	4
4	C Programming	CSE	3	0	0	3
5	Electronic Devices	ECE	3	0	0	3
PRACTICAL						
6	Engineering Chemistry Lab	CHEM	0	0	3	2
7	Engineering Graphics Lab	MECH	0	0	3	2
8	C Programming Lab	CSE	0	0	3	2
9	Electronic Devices Lab	ECE	0	0	3	2
TOTAL						24

SEMESTER I	L	T	P	C
ENGLISH FOR ENGINEERS	3	0	0	3

(For I year BE- common to all branches)

Objectives:

1. To enable students to develop LSRW skills in English.
2. To become effective communicators in English.
3. To ensure that learners use Electronic media materials for developing language skills.

OUTCOMES:

Learners should be able to:

- Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
- Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
- Read different genres of texts adopting various reading strategies.
- Listen/view and comprehend different spoken discourses/excerpts in different accents.

Unit – I

Self introduction - Simulations using E Materials - Whatsapp, Face book, Hiker, Twitter- Effective Communication with Minimum Words - Interpretation of Images and Films - Identify the different parts of speech- Common Errors in English – Scientific Vocabulary, (definition and meaning) - Listening Skills- passive and active listening, Listening to native speakers, , guided note taking - Characteristics of a good listener– Telephonic conversation with dialogue.

Unit – II

Articles - Phonetics (Vowels, Consonants and Diphthongs) – Pronunciation Guidelines –Listening to Indian speakers from different regions, intrusion of mother tongue – Homophones – Homonyms, Note taking and Note making - Difference between Spoken and Written English- Use of appropriate language - Listening and Responding to Video Lectures (Green India, environment, social talks) - Extempore.

Unit – III

Tense forms- Verbal & Non verbal communication – Describing objects – Process Description- Speaking Practice – Paragraph Writing on any given topic (My favourite place, games / Hobbies / School life, etc.) –Types of paragraphs- Telephone Etiquettes.

Unit – IV

Impersonal Passive Voice- Conditional Sentences – Technical & Non technical Report Writing (Attend a technical seminar & submit a report) – News Letters & Editing –Skimming & Scanning - How to Improve Reading Speed – Designing Invitations & Poster Preparation.

Unit – V

Sentence Pattern (SVOCA) - Statement of Comparison - Transcoding – Informal letters - SWOT analysis– Resume Writing- Difference –Bio – data, Resume and CV.

References:

1. Practical English Usage- Michael Swan (III edition), Oxford University Press
2. Grammar Builder- I, II, III, and Cambridge University Press.

SEMESTER I	L	T	P	C
PHYSICS FOR ENGINEERS	3	0	0	3

AIM	To familiarize students with the basic concepts of Physics and their application in Engineering & Technology
OBJECTIVE	<ul style="list-style-type: none"> ➤ To understand the elastic properties of materials ➤ To understand the properties of crystals ➤ To understand the significance of laser and its applications in technology ➤ To understand the basic principles of optical fibres and their applications ➤ To understand the Non-Destructive Testing techniques
OUTCOME	The fundamental knowledge in physics will improve the scientific thinking of students

UNIT I – Properties of matter

9

Elasticity – Hooke’s law – Stress-strain diagram - Relationship between three moduli of elasticity (qualitative) - Poisson’s ratio – Young’s modulus by uniform bending and non-uniform bending – Experimental determination of rigidity modulus – I-shaped girders.

UNIT II – Crystal Physics

9

Unit cell – Bravais lattice – Miller indices – Calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC, HCP structures – Crystal imperfections – point, line, surface and volume defects.

UNIT III – Lasers

9

Laser characteristics - Stimulated Emission – Population Inversion - Einstein coefficients – Lasing action – Types of Laser – Nd:YAG laser, CO₂ laser, GaAs laser – Applications of Laser – Holography – construction and reconstruction of a hologram

UNIT IV – Fibre Optics

9

Principle and propagation of light in optical fibres – numerical aperture and acceptance angle – types of optical fibres (material, refractive index, mode) – Applications: Fibre optic communication system – fibre optic displacement sensor and pressure sensor.

UNIT V - Non – Destructive Testing

9

Introduction – Types of NDT - Liquid penetrant method – characteristics of penetrant and developer - ultrasonic flaw detector – Ultrasonic scanning methods - X-ray Radiography: displacement method – X-ray Fluoroscopy.

Total hours : 45

TEXT BOOK

“Engineering Physics”, compiled by Department of Physics, Vinayaka Missions University, Salem.

REFERENCE BOOKS

1. Beiser, Arthur, “Concepts of Modern Physics”, 5th Ed., McGraw-Hill, 2009.
2. Halliday.D, Resnick.R, Walker.J, Fundamentals of Physics, Wiley & sons, 2013.
3. Gaur R. K. and Gupta S. L., “Engineering Physics”, Dhanpat Rai publishers, New Delhi, 2001.
4. Avanadhanulu.M.N., Arun Murthy.T.V.S, Engineering Physics Vol. I, S.Chand, 2014.
5. Rajendran. V, “Engineering Physics”, Tata Mc Graw Hill Publication and Co., New Delhi, 2009.

SEMESTER I	L	T	P	C
CALCULUS FOR ENGINEERS	3	1	0	4

Common to BE First Semester
(MECH, ECE, CSE, CSSE, EEE, EIE, CIVIL, IT, MECHT,
AERO, ETC & AUTO)

Aim:

To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objectives:

- To improve their ability in solving geometrical applications of differential calculus problems
- To equip themselves familiar with the functions of several variables.
- To have knowledge in multiple calculus
- To improve their ability in Vector calculus

Outcome:

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

UNIT I

APPLICATION OF DIFFERENTIAL CALCULUS

Curvature – Cartesian and Parametric Co-ordinates – Centre and radius of curvature – Circle of curvature – Evolute

UNIT II

FUNCTIONS OF SEVERAL VARIABLES

Partial Derivatives – Total Differential - Maxima and Minima – constrained Maxima and Minima by Lagrangian Multiplier Method.

UNIT III

INTEGRATION

Concept of integration-Integration of Rational and Trigonometric functions – Using Partial Fractions – Integration by parts.

UNIT IV

MULTIPLE INTEGRAL

Double integration –change of order of integration- Cartesian and polar coordinates –Area as a double integral – Triple integration.

UNIT V

VECTOR CALCULUS

Directional derivatives – Gradient, Divergence and Curl – Irrotational and solenoidal- vector fields – Vector integration – Green’s theorem, Gauss divergence theorem and Stoke’s theorem (excluding proof).

TEXT BOOK:

1. “Engineering Mathematics” by Department of Mathematics, VMU

2. Veerarajan, T., "Engineering Mathematics", Tata McGraw Hill Publishing Co., NewDelhi, 2006.
3. Dr.A .Singaravelu , Engineering Mathematics Volume I & Volume II by Meenakshi Publications.

REFERENCES:

1. Grewal, B.S., "Higher Engineering Mathematics" (36th Edition), Khanna Publishers, Delhi 2001.
2. Kreyszig, E., "Advanced Engineering Mathematics" (8th Edition), John Wiley and Sons (Asia) Pvt Ltd., Singapore, 2001.
3. Kandasamy .P., Thilagavathy. K., and Gunavathy. K., "Engineering Mathematics", Volumes I & II (4th edition), S.Chand & Co., New Delhi., 2001.
4. T. Veerarajan, "Engineering Mathematics" (for semester III), Third Edition Tata McGraw- Hill Publishing Company limited.

SEMESTER I	L	T	P	C
ESSENTIALS OF COMPUTER SCIENCE AND ENGINEERING	3	0	0	3

(Common for All Branches)

AIM:

The aim is to introduce the fundamentals of Computer to the students

OBJECTIVES:

- To provide basic knowledge on hardware and software components of computers.
- To introduce and demonstrate various software applications
- To introduce Problem solving methodologies
- To learn about Implementation of Algorithms
- To learn about HTML

OUTCOMES:

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

- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.

UNIT I - Basics of Computer and Information Technology

10

Computer – Generations, Types of Computers, Block diagram of a computer- Components of a computer system - Hardware and software definitions - Categories of software – Booting - Installing and Uninstalling a Software - Software piracy - Software terminologies - Applications of Computer - Role of Information Technology - History of Internet - Internet Services.

UNIT II - Software Applications (Practical Learning)

7

Office Automation: Application Packages - Word processing (MS Word) - Spread sheet (MS Excel) – Presentation (MS PowerPoint).

UNIT III - Problem Solving Methodologies

10

Problems Solving Techniques - Program Development Cycle – Algorithm Development - Flow chart generation – Programming Constructs (Sequential, Decision-Making, Iteration) - Types and generation of programming languages

UNIT IV Implementation of Algorithms

9

Implementation of Algorithms-program verification-The efficiency of algorithms-The analysis of algorithms-Fundamental Algorithms

UNIT V HTML

9

Basics of HTML – Applications of HTML – HTML Fonts – anchor tag and its attributes – Using images in HTML programs – list tag - Table tag – HTML forms

TOTAL HOURS: 45

TEXT BOOKS

1. *Essentials of Computer Science and Engineering – by VMU*

SEMESTER I	L	T	P	C
ESSENTIALS OF CIVIL AND MECHANICAL ENGINEERING	3	0	0	3

OBJECTIVES:

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical Engineering.

OUTCOMES:

- Ability to fabricate carpentry components and pipe connections including plumbing works.
- Ability to use welding equipment's to join the structures.

A - CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS 9

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

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

UNIT II BUILDING COMPONENTS AND STRUCTURES 9

Foundations: Types – Requirement of good foundations. Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Types of Bridges and Dams

B – MECHANICAL ENGINEERING

UNIT III ENERGY SOURCES 9

Introduction, Classification of Power Plants – Working principle of steam, Diesel, Hydro and Nuclear Power plants – Merits and Demerits – Introduction to Renewable Energy Sources

UNIT IV IC ENGINES & REFRIGERATION AND AIR CONDITIONING SYSTEM 9

Internal combustion engines – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines.

Basic Terminology of Refrigeration and Air Conditioning-Principle of vapour compression and absorption system.

UNIT V BASIC MANUFACTURING PROCESSES 9

Casting process-Introduction, Principle, Advantages, casting defects

Forging process-introduction, forging, rolling, drawing, extrusion

Welding process- introduction, principle, types-Gas and arc welding

TOTAL: 45 PERIODS

REFERENCES:

1. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, (1996).
2. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. (1999).
3. Seetharaman S., “Basic Civil Engineering”, Anuradha Agencies, (2005).
4. Venugopal K. and Prahua Raja V., “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, (2000).
5. Shantha Kumar S R J., “Basic Mechanical Engineering”, Hi-tech Publications, Mayiladuthurai, (2000).

PRACTICALS

SEMESTER I	L	T	P	C
PHYSICS LAB (Real & Virtual)	0	0	3	2

Aim	➤ To understand the experiments through online virtual demonstration followed by real hands-on experience
Objective	<ul style="list-style-type: none"> ➤ To understand the working principle of various physics equipments ➤ To learn about taking reading precisely ➤ To know about the systematic handling of equipments
Outcome	➤ Students will have the knowledge of taking measurements precisely.

List of Experiments

1. Young's modulus of a bar - Non-uniform bending
2. Rigidity modulus of a wire - Torsional Pendulum
3. Viscosity of a liquid - Poiseuille's method
4. Velocity of ultrasonic waves in liquids - Ultrasonic Interferometer
5. Particle size determination using Laser
6. Wavelength of spectral lines – grating - Spectrometer
7. Thickness of a wire - Air wedge Method
8. Thermal conductivity of a bad conductor - Lee's disc
9. Band gap determination of a thermistor - Post Office Box
10. Specific resistance of a wire – Potentiometer

SEMESTER I	L	T	P	C
WORKSHOP PRACTICES	0	0	3	2

(Common to all Branches - Except Bio-Tech & Bio info)

OBJECTIVES:

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

OUTCOMES:

- Ability to fabricate carpentry components and pipe connections including plumbing works.
- Ability to use welding equipment's to join the structures.

FITTING

1. Square Joint
2. Dove Tail Joint

CARPENTRY

1. Half Lap Joint
2. Dove Tail Joint

WELDING

1. Arc Welding of butt Joint.
2. Arc Welding of Lap Joint

CASTING

1. Foundry – Mould Preparation using single piece pattern

DEMONSTRATION

1. Sheet Metal – Fabrication of cone
2. Black Smithy – Round to square rod

Reference:

1. "Basic Workshop Practice", Department of Mechanical Engineering, Vinayaka Missions University

SEMESTER I	L	T	P	C
COMPUTER LAB	0	0	3	2

(Common for all branches)

OBJECTIVES:

The student should be made to:

- Be familiar with the use of Office software.
- Be exposed to presentation and visualization tools.
- Be exposed to problem solving techniques and flow charts.
- Be familiar with programming in C.
- Learn to use Arrays, strings, functions, structures and unions.

OUTCOMES:

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

- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.

LIST OF EXPERIMENTS:

1. Implement Mail Merge in MS-Word and send letters to parents regarding the semester fee structure of the student.
2. Using MS-Word, create a leave letter addressed to your faculty advisor
3. A) Using MS-Word, create a table for a list of students with different font sizes and colours
B) Using MS-Word, create a flow-chart using the basic shapes available. Use page border, a watermark, header and footer
4. Using MS-PowerPoint, create a presentation about the university
5. Using MS-PowerPoint, create a story line with various animations and transition effects.
6. Using MS-Excel, Analyze Students performance using MS-Excel and prepare a chart type report.
7. Using MS-Excel, create a pivot table
8. Using MS-Excel, create look-up tables
9. Using MS-Excel, create graphs for the weather condition in various cities of India
10. Create an HTML page Create an HTML page to
 - a) Click on a link and go to the bottom of the page using <a href>
 - b) Display an image.
11. Create an HTML page to
 - a) Display ordered and unordered lists of your friends names and sports persons
 - b) Display a table with 3 columns and 4 rows.

SEMESTER II	L	T	P	C
BUSINESS ENGLISH	3	0	0	3

(For I year BE, Common to all branches)

OBJECTIVES:

- To impart and enhance corporate Communication
- To enable learners to develop presentation skills.
- To build confidence in learners to use English in Business contexts.

OUTCOMES:

Learners should be able to

- speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies.
- write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.

Unit – I

Subject and verb agreement (Concord) – Preposition and Relative Pronoun – Cause and effect- Phrasal Verbs – Idioms and Phrases – Listening comprehension - Listening to Audio Files and Answering Questions – Framing Questions – Negotiation skills, Persuasion Skills and Debating skills.

Unit – II

Stress (Word stress and Sentence stress) – Intonation – Difference between British and American English– Vocabulary – Indianism - Compound Words (including technical terminology).

Unit – III

Reading Skills – Understanding ideas and making inferences – Group Discussion – Types of Interviews, FAQs – e- mail Netiquette, Sample e-mails – Watching Documentary Films and responding to questions.

Unit – IV

Corporate communication – Recommendation - Instruction – Check List- circulars- Inter office memo – Minutes of meeting and Writing agenda – Discourse Markers- Rearranging the jumbled sentences – Technical Articles – Project Proposals, Making Presentations on given topics – Preparing Power Point Presentations.

Unit – V

Critical Reading – Book Review - Finding Key Information and Sifting Facts from Opinions – Business letters (Calling for Quotation, Placing orders and Complaint letters) – Expansion of an Idea. – Creative Writing.

References:

1. Grammar Builder- I, II, III -Cambridge University Press.
- Technical English-Writing, Reading and Speaking- Pickett and Lester, Harper and Row publication

SEMESTER II	L	T	P	C
CHEMISTRY FOR ENGINEERS	3	0	0	3

**(Common to all branches except Biotechnology)
B.E / B.Tech. - SECOND SEMESTER –CBCS regulations 2016**

Objective:

To impart in basic knowledge in chemistry so that the student will understand the engineering concept and they can face the competitive examinations effectively.

To improve the knowledge in the instrument applications.

To inculcate the knowledge of advanced material.

Outcome:

At the end of the course students will come out with knowledge of basic Engineering chemistry.

UNIT I : ELECTROCHEMISTRY, BATTERIES AND FUEL CELLS 9 Hrs

Ostwald Law and Debye Huckle's law - Electrode potential - Nernst equation – Electrodes (SHE, Calomel and Glass)- cells - EMF measurement-emf and galvanic series.

Primary battery (Daniel and dry cell) – secondary battery (lead Acid storage battery and Nickel-Cadmium battery) – Fuel cell (H₂-O₂ fuel cell)

UNIT II : WATER TECHNOLOGY & CORROSION 9 Hrs

Sources of water – impurities – Hardness and its determination (problems to be avoided) – boiler troubles – water softening (zeolite & Demineralisation) – Domestic water treatment – Desalination (Electrodialysis & Reverse Osmosis).

Corrosion – Types – principles – corrosion control methods (Electroplating, Electroless plating, Sacrificial anode and Impressed current method).

UNIT III: CHEMISTRY OF ADVANCED MATERIALS 9 Hrs

Refractories – properties and uses, Portland cement –manufacturing, setting and hardening –Special cement, ceramics.

Organic electronic material, shape memory alloys, smart materials, polymers(PVC, Teflon, Bakelite)-fibers(optical fibre) & composites (FRP, MMC & PMC)

UNIT IV : PHASE EQUILIBRIA & NUCLEAR CHEMISTRY 9 Hrs

Phase rule: statement and explanation of terms involved – One component system (water) – Condensed phase rule – Two component system (Lead-silver) .

Nuclear Chemistry – Fission – Fusion – working of nuclear reactor – Radiations and harmful effects.

UNIT V : CHROMATOGRAPHY AND SPECTROSCOPY 9 Hrs

Chromatography — classification (Paper, Column, Thin Layer, Gas, HPLC). Principle and applications.

Spectroscopy – Electromagnetic radiation – Beer Lambert's law – UV – Visible – IR – Atomic absorption & flame emission spectroscopy (Principle, Instrumentation, block diagram).

TEXT BOOK: Engineering Chemistry by VMU.

References:

1. A text book of Engineering Chemistry by S.S. Dara, S.Chand & company Ltd., New Delhi
2. Engineering Chemistry by Jain & Jain, 15th edition Dhanpatrai Publishing Company (P) Ltd., New Delhi
3. A text book of Engineering Chemistry by Shashi Chawla, Edition 2012 Dhanpatrai & Co., New Delhi.
4. Engineering Chemistry by Dr.A.Ravikrishnan, Sri Krishna Publications, Chennai

SEMESTER II	L	T	P	C
TRANSFORMS AND MATRICES	3	1	0	4

Common to BE - Second Semester

(MECH, ECE, CSE, CSSE, EEE, EIE, CIVIL, IT, MECHT, AERO, ETC & AUTO)

Aim:

To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objective:

- To apply advanced matrix knowledge to Engineering Problems\
- Transform techniques are very useful in the field of signal and system analysis.
- Z - transform plays an important role in analysis of Discrete signals. This is a prelude to learn higher semester courses.
- To provide the standard methods for solving differential equations as well as methods based on the use of matrices or Laplace transforms

Outcome:

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

UNIT I

MATRICES

Characteristic equation – Eigen values and eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors (Without proof) – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form.

UNIT II

LAPLACE TRANSFORMS

Laplace transform – transform of elementary functions – basic properties – derivatives and integrals of transforms – transforms of derivatives and integrals – initial and final value theorems – Transform of periodic functions.

UNIT III

INVERSE LAPLACE TRANSFORMS & APPLICATIONS

Inverse Laplace transform – Convolution theorem – Initial and Final value theorem-Solution of linear ODE of second order with constant coefficients and first order simultaneous equation with constant coefficients using Laplace transforms.

UNIT IV

FOURIER TRANSFORMS

Fourier transform pairs - Fourier Sine and Cosine transforms – Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

UNIT V

Z-TRANSFORMS

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of Difference Equations using Z-Transform.

TEXT BOOKS

1. “Engineering Mathematics” by Department of Mathematics, VMU
2. Veerarajan, T., “Engineering Mathematics”, Tata McGraw Hill Publishing Co., NewDelhi, 2006.

3. Dr.A .Singaravelu , Engineering Mathematics Volume I & Volume II by Meenakshi Publications.
4. A.Singaravelu, "Transforms and Partial Differential Equations", Meenakshi Agencies, Chennai

REFERENCE BOOKS

1. Grewal, B.S., "Higher Engineering Mathematics" (36th Edition), Khanna Publishers, Delhi 2001.
2. Kreyszig, E., "Advanced Engineering Mathematics" (8th Edition), John Wiley and Sons (Asia) Pvt Ltd., Singapore, 2001.
3. Kandasamy .P., Thilagavathy. K., and Gunavathy. K., "Engineering Mathematics", Volumes I, II & III (4th edition), S.Chand & Co., New Delhi., 2001

SEMESTER II	L	T	P	C
C PROGRAMMING	3	0	0	3

(Common for All Branches)

AIM:

The aim is to introduce C programming to the students.

OBJECTIVES:

- To introduce Basics of C
- To understand Control Structures & Arrays
- To learn about String concept, Structure and Union in C
- To introduce the concepts of Functions and Pointers
- To introduce Memory and File management concepts in C

OUTCOMES:

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

- Design C Programs for problems.
- Write and execute C programs for simple applications

UNIT I - Basics of C

9

Identifiers, variables, expression, keywords, data types, constants, scope of variables. Operators: arithmetic, logical, relational, conditional and bitwise operators - Special operators: size of () & comma (,) operator - Precedence and associativity of operators - Type conversion in expressions.

UNIT II - Control Structures & Arrays

9

Basic input/output and library functions: Single character input/output i.e. getch(), getchar(), getche(), putchar() - Formatted input/output: printf() and scanf() – Library functions (mathematical and character functions). Decision Making and Branching – Looping statements. Arrays – Initialization – Declaration – One dimensional and two dimensional arrays.

UNIT III String, Structure & Union

9

Strings: Declaration-Initialization and string handling functions. Structure and Union: structure declaration and definition – Accessing a Structure variable – Structure within a structure – Union.

UNIT IV Functions and Pointers

9

Function –Function Declaration–function definition- Pass by value – Pass by reference – Recursive function – Pointers - Definition – Initialization – & and * operators - Pointer to functions-Function returning pointers – Pointers and arrays

UNIT V Memory and File management

9

Static and dynamic memory allocation - Storage class specifier - Preprocessor directives. File handling concepts – File read – write- Functions for file manipulation: fopen, fclose, gets, puts, fprintf, fscan, getw, putw, fputs, fgets, fread, fwrite - Random access to files: fseek, ftell, rewind - File name as Command Line Argument.

TOTAL HOURS: 45

TEXT BOOKS:

1. Balaguruswami.E, “Programming in C”, TMH Publications,1997

REFERENCE BOOKS:

1. Behrouz A. Forouzan & Richard F. Gilberg, “Computer Science A Structured Programming using C”, Cengage Learning, 3rd Edition, 2007
2. Gottfried , “Programming with C”, schaums outline series, TMH publications,1997
3. Mahapatra , “Thinking in C”, PHI publications, 2nd Edition, 1998.
4. Subbura.R , “Programming in C” , Vikas publishing, 1st Edition, 2000

SEMESTER II	L	T	P	C
ELECTRONIC DEVICES	3	0	0	3

OBJECTIVES:

The student should be made to:

- Be exposed to basic electronic devices
- Be familiar with the theory, construction, and operation of Basic electronic devices.

OUTCOMES:

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

- Explain the theory, construction, and operation of basic electronic devices.
- Use the basic electronic devices

UNIT I-SEMICONDUCTOR DIODES AND SPECIAL PURPOSE DIODES (10 hours)

Overview on Physics and Properties of Semiconductors: Intrinsic semiconductor – extrinsic semiconductor – Fermi level in an intrinsic semiconductor – conductivity of a metal, intrinsic semiconductor and extrinsic semiconductor – drift – diffusion – recombination – carrier life time. Semiconductor diodes: Formation of PN junction – working principle – VI characteristics – Zener Diode – VI characteristics.

UNIT II-BIPOLAR TRANSISTORS (6 hours)

Bipolar Transistors: Construction – working – transistor currents – transistor configurations and input-output characteristics – Early effect (basewidth modulation) – Ebers Moll model – transistor as an amplifier – Transistor as a switch

UNIT III-FIELD-EFFECT TRANSISTORS (8 hours)

Field-Effect Transistors : construction, working and VI characteristics of JFET – comparison of BJT and JFET – MOSFET – enhancement MOSFET, depletion MOSFET, their working principle and VI characteristics, comparison of MOSFET with JFET, comparison of D MOSFET with E MOSFET, CMOS, MESFET, CCD.

UNIT IV-DC POWER SUPPLIES (12 hours)

Rectifiers and Filters : Block schematic of a typical DC power supply, single phase HWR, FWR, full-wave bridge rectifier, power supply filters (ripple factor and efficiency analysis), bleeder resistor, voltage dividers
Voltage regulators: voltage regulation, zener diode shunt regulator, transistor series regulator, transistor shunt regulator, switching regulators, design of complete DC power supply circuit.

UNIT V-INTEGRATED CIRCUIT FABRICATION (9 hours)

Integrated circuit – advantages and drawback of ICs – scale of integration – classification of ICs – definition of linear IC and digital IC with examples – manufacturing process of monolithic ICs – fabrication of components (diode, capacitor, bipolar transistor, resistor and field – effect transistor) on monolithic IC – comparison of MOS ICs and bipolar ICs.

TEXT BOOKS

1. Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, Pearson Education, 9th Edition, 2009.
2. B. Somanathan Nair, “Electronic Devices and Applications”, PHI, 2006

REFERENCES

1. Jacob Millman, Christos C Halkias, Satyabrata Jit, “Electron Devices and Circuits”, Tata McGraw Hill, 2010.
2. David A Bell, “Fundamentals of Electronic Devices and Circuits”, Oxford Press, 2009.
3. B L Theraja, R S Sedha, “Principles of Electronic Devices and Circuits”, S.Chand, 2004

PRACTICALS

SEMESTER II	L	T	P	C
ENGINEERING CHEMISTRY LAB	0	0	3	2

(REAL & VIRTUAL)

(Common to all branches except Biotechnology)

B.E / B.Tech. - SECOND SEMESTER –CBCS regulations 2016

OBJECTIVES:

- To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
- To acquaint the students with the determination of molecular weight of a polymer by Vacometry.

OUTCOMES:

The students will be conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters, corrosion measurement and cement analysis.

LIST OF EXPERIMENTS:

1. Estimation of total hardness of water sample by EDTA method.
2. Estimation of dissolved oxygen by Winkler's method.
3. Estimation of ferrous ion by Potentiometry.
4. Precipitation reaction by Conductometry.
5. Acid base reaction by pH metry.
6. Estimation of copper from its ore.
7. Estimation of iron by spectrophotometer.
8. Estimation of sodium by flame photometer.
9. Separation of mixture of components using thin layer chromatography.
10. Corrosion experiment by weight loss methos.

SEMESTER II	L	T	P	C
ENGINEERING GRAPHICS LAB	0	0	3	2

(Common to ALL BRANCHES EXCEPT BIOTECH,BIO-INFO)

OBJECTIVES:

The student should be made to:

- Be familiar with the use of Office software.
- Be exposed to presentation and visualization tools.
- Be exposed to problem solving techniques and flow charts.
- Be familiar with programming in C.
- Learn to use Arrays, strings, functions, structures and unions.

OUTCOMES:

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

- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.

Concepts and conventions (Not for Examination)

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

UNIT I PLANE CURVES AND FREE HAND SKETCHING 9

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

UNIT II PROJECTION OF POINTS, LINES 9

Projection of points, Projection of straight lines located in the first quadrant: inclined to both planes – Determination of true lengths and true inclinations – rotating line method only.

UNIT III PROJECTION OF SOLIDS 9

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

UNIT IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 9

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones

UNIT V ISOMETRIC VIEW AND PERSPECTIVE PROJECTION 9

Principles of isometric View – isometric scale – isometric view of simple solids- Introduction to Perspective projection

TEXT BOOKS:

1. N.D. Bhatt, “Engineering Drawing” Charotar Publishing House, 46th Edition, (2003).
2. K. V. Natarajan, “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai (2006).

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1. M.S. Kumar, "Engineering Graphics", D.D. Publications, (2007).
2. K. Venugopal & V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited (2008).
3. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education (2005).
4. K. R. Gopalakrishnana, "Engineering Drawing" (Vol.I&II), Subhas Publications (1998).
5. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).
6. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).

SEMESTER II	L	T	P	C
C PROGRAMMING LAB	0	0	3	2

(Common for All Branches)

OBJECTIVES:

The students should be made to:

- Learn the organization of a digital computer.
- Be exposed to the number systems.
- Learn to think logically and write pseudo code or draw flow charts for problems.
- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

OUTCOMES:

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

- Design C Programs for problems.
- Write and execute C programs for simple applications

LIST OF EXPERIMENTS:

1. Write a C Program to Implementation of Sine and cosine series
2. Write a C Program to calculate Simple Interest
3. Write a C Program to generate Fibonacci Series using for loop
4. Write a C program to calculate factorial using while loop
5. Write a C Program to
 - a) Find the greatest of three numbers using if condition.
 - b) Find the greatest of three numbers using conditional operator.
6. Write a C program for finding the roots of a given quadratic equation using conditional control statements
7. Write a C program to
 - a) Compute matrix multiplication using the concept of arrays.
 - b) Illustrate the concept of string handling functions.
8. Write a C program to
 - a) Find the largest element in an array using pointers.
 - b) Convert a binary number to decimal or decimal to binary using functions.
9. Write a C program to read data from keyboard, write it to a file named student again read the same data from student file and write it into data file.
10. Write a C program to store employee details using the concept of structures.

SEMESTER II	L	T	P	C
ELECTRONIC DEVICES LAB	0	0	3	2

OBJECTIVES:

The student should be made to:

Be exposed to the characteristics of basic electronic devices

Be familiar Rectifiers & Regulators

OUTCOMES:

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

- Learn the characteristics of basic electronic devices
- Design amplifier circuits & power supplies

List of Experiments

1. Characteristics of PN junction Diode.
2. Characteristics of Zener diode.
3. Input, Output characteristics of CE Amplifier.
4. Input, Output characteristics of CC Amplifier.
5. Transfer characteristics of JFET.
6. Input, Output characteristics of UJT
7. Half wave rectifier.
8. Full wave rectifier.
9. Voltage Regulator.
10. Simulation experiments using PSPICE.