DEPARTMENT OF
CIVIL ENGINEERING

CURRICULUM & SYLLABUS - FIRST YEAR
B.E. – CIVIL ENGINEERING
COLLEGE VISION

- Transforming lives through quality Education and research with human values.

COLLEGE MISSION

- To maintain excellent infrastructure and highly qualified and dedicated faculty.
- To provide a conducive learning environment with an ambience of humanity, wisdom, creativity and team spirit.
- To promote the values of ethical behavior and commitment to the society.
- To partner with academic, industrial and government entities to attain collaborative research.
VISION

- Producing outstanding Civil Engineering Professionals with human values to face future challenges.

MISSION

- To provide with excellent teaching and research ambience.
- To prepare student for leadership roles in civil engineering.
- To facilitate student with lifetime skills and human values.
- To collaborate with industries to meet the ever challenging environment.

Program Educational Objectives (PEO)

Programme educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

1. Will have a successful career in civil engineering.
2. Pursue advanced degrees in support of their chosen profession.
Program Outcomes (PO)

At the time of graduation graduates of our CIVIL programme are expected to have

1. An ability to apply fundamental knowledge of mathematics, science and civil engineering in real-world problems.
2. An ability to identify, formulate and provide solution for engineering problems.
3. An ability to design and evaluate the desired needs.
4. An ability to conduct test and interpret the results.
5. An ability to use the skills, modern tools and techniques.
6. An ability to analyze the local and global impact of civil engineering.
7. Awareness of environment, innovations and sustainable development.
8. An ability to display their professional responsibilities meeting ethical standards.
9. An ability to have an idea of contemporary issues and an ability to function on multidisciplinary teams.
10. An ability to communicate effectively both in written and oral.
11. Recognition of the need for and an ability to engage in professional development and life-long learning.
12. An ability to lead a project team for the successful completion.
# B.E. – CIVIL ENGINEERING

## REGULATIONS – 2015

### FIRST YEAR CURRICULUM AND SYLLABUS

#### SEMESTER – I

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Category</th>
<th>Course Code</th>
<th>Course Title</th>
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#### SEMESTER – II

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**MAC** - Mandatory Course, **CFC** - Common Foundation Course, **SFC** - Specific Foundation Course, **PCC** – Programme Core Course, **PEC** – Programme Elective Course, **OEC** – Open Elective Course

*Common to all B.E. / B.Tech., Programmes
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**FORMAT FOR COURSE CODE**

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1 5 C E 2 3 C
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- **Compulsory Course**
- **Course Number**
- **Semester Number**
- **Branch Name**
- **Regulations 2015**
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO1: acquire the basics of English communication skills. (K3)
CO2: apply the basic language skills to understand various aspects of technical writing. (K3)
CO3: understand main ideas, specific details and implied meaning while listening and develop the factual & imaginative information. (S4)
CO4: coordinate and communicate in a wide range of situation. (S4)
CO5: integrate and apply the acquired skills in real life situation. (S4)

UNIT I 9
Parts of Speech - Sentence Structure (SV/SVO/SVC/SVIDO) - Identifying the kinds of sentences (Statement, Interrogative, Imperative, Exclamatory & Negative) - Informal writing (Diary writing & letter to friend/ parent/siblings) - Self Introduction - Listening for general information.

UNIT II 9
Transformation of words into different grammatical forms- Converting one kind of sentence into another sentence (Statement, Interrogative, Imperative, Exclamatory & Negative) - Technical Vocabulary - Tense Usage (Present tense- Past tense - Future tense - Writing passages in all tenses) - Letter writing (Permission letter & Requisition letter) - Listening for specific information.

UNIT III 9
Personality Adjective - Concord - Letter Writing: Invitation / Acceptance letters - Itinerary Writing (with valued points/ situation) - Phonetics (Vowels - Consonants - Diphthongs) - Listening and filling up the information - Process Description (with valued points).

UNIT IV 9
IF Conditionals - British & American Vocabulary - Letter Writing (Declining / Thanking letters) - Email writing (with valued points) - Instruction Writing - Listening and giving opinion on the pictures.

UNIT V 9
Reading comprehension - Error Spotting (Article, Preposition, Modals and Concord) - Presenting article based on newspaper reading- Situational Conversation - Listening and writing dialogues – Checklists.

L: 45 TOTAL: 45 PERIODS

Suggested Activity: Each student should read the suggested fiction for oral assignment

TEXT BOOKS

REFERENCES

Listening files: Audio files from net sources, Softwares: ODLL, Globerena.
15SH12C MATHEMATICAL FOUNDATIONS FOR ENGINEERS (Common to all B.E. / B.Tech. Degree Programmes) L T P C 3 2 0 4

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: make use of orthogonal transformation. (K3)
CO 2: use the basic concepts of three dimensional geometry in engineering. (K2)
CO 3: obtain maxima and minima of real valued functions. (K3)
CO 4: solve ordinary differential equations. (K3)
CO 5: solve partial differential equations. (K3)

UNIT I MATRICES 15
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Independency and dependency of Eigen vectors – Properties of Eigen values and Eigen vectors (excluding proofs) - Diagonalisation of a matrix by orthogonal transformation- Quadratic forms – Reduction of quadratic form to canonical form by orthogonal transformation and its nature.

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY 15
Direction cosines and Direction ratios- Planes and Lines - Equations of plane and line - Intersection of two planes - Shortest distance between two lines - Equation of a sphere - Plane section of a sphere - Tangent Plane - Orthogonal spheres.

UNIT III FUNCTIONS OF SEVERAL VARIABLES 15
Euler’s theorem on homogeneous functions of two variables - Taylor’s Series - Jacobians - Maxima and Minima - Constrained Maxima and Minima by the method of Lagrange multipliers.

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 15
Solutions of higher order linear differential equations with constant coefficients - Cauchy’s and Legendre’s linear equations - Solutions of simultaneous first order linear equations with constant coefficients - Method of variation of parameters.

UNIT V PARTIAL DIFFERENTIAL EQUATIONS 15

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: summarize the properties and structures of solids. (K2)
CO 2: define the principles of acoustics and ultrasonics and apply the ultrasonic methods for industrial and medical field. (K1)
CO 3: choose the appropriate Laser technique for industrial and medical applications. (K3)
CO 4: describe the different types, fabrication, losses of optical fibers and their applications in communication and instrumentation.(K1)
CO 5: explain the physical properties of photons & electrons and their applications in different electron microscopes.(K2)

UNIT I    PROPERTIES OF MATTER AND CRYSTAL PHYSICS
Hooke’s law - Types of moduli of elasticity - Determination of Rigidity modulus and Young’s modulus - I shaped Girders. 
Miller indices – d spacing - Characteristics of SC, BCC, FCC and HCP structures.

UNIT II    ACOUSTICS AND ULTRASONICS
Ultrasonics: Production - magnetostriction generator - piezoelectric generator, Properties - Cavitations - Velocity measurement - acoustic grating, Industrial applications - Medical application - Sonograms.

UNIT III   LASER SYSTEM AND APPLICATIONS

UNIT IV    FIBER OPTICS AND ITS APPLICATIONS
Numerical aperture and Acceptance angle - Types of optical fibers - Double crucible technique – Splicing - Loss in optical fiber - Fiber optical communication system - Applications - Fiber optic sensors - Endoscope.

UNIT V     QUANTUM PHYSICS
Photo electric effect - Matter Waves - Davisson and Germer experiment - Heisenberg’s Uncertainty principle - Schrodinger’s wave equation - particle in one dimensional box - Electron microscope - Scanning electron microscope - Transmission electron microscope.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: identify suitable water treatment techniques for industrial and domestic purpose. (K3)
CO 2: explain the type of corrosion and corrosion control methods. (K2)
CO 3: select the polymer for specific application. (K3)
CO 4: explain nano materials preparation. (K2)
CO 5: outline the principle and instrumentation of various analytical techniques. (K2)

UNIT I   WATER TREATMENT


UNIT II  CORROSION AND ITS CONTROL

Chemical corrosion – electrochemical corrosion – mechanism – different types of electrochemical corrosion – factors influencing corrosion – corrosion control methods.

UNIT III  ENGINEERING POLYMERS


UNIT IV  NANO MATERIALS

Nanoparticles – synthesis of CNT – precipitation, thermolysis, hydrothermal, solvothermal, electrodeposition, chemical vapour deposition, laser ablation – toxic effect of nano materials- properties and applications.

UNIT V  ANALYTICAL TECHNIQUES

Principle, instrumentation and applications of UV-Visible and IR spectroscopy; chromatography: instrumentation and working of gas chromatography and HPLC; conductivity measurements – pH measurements – applications.

TEXT BOOKS


REFERENCES

COURSE OUTCOMES
Upon Completion of this course, the students will be able to
CO 1: recognizes the needs of engineering and should be able to acquaint with various
fields of engineering and technology. (A4, K2)
CO 2: practices how to be successful in work and life in general. (K2, S3, A5)
CO 3: feels proud to be an engineering student. (A4)
CO 4: appreciates the initial career profiles of engineers. (A3)
CO 5: prepares for an Engineering Career. (A5)
CO 6: should be able to appreciate creative thinking means to provide engineering solution
(K2, A3)
CO 7: should be able to appraise the values of Outcome Based Education and Choice
Based Credit System. (K2, A2)

UNIT I  HISTORY OF ENGINEERING AND INTRODUCTION TO ENGINEERING 7
PROFESSION
History of Engineering: Definition of Engineering, The Beginnings of Engineering, Overview of
ancient Engineering, Traveling through the Ages, A case study of two historic Engineers –
Lionardo da Vincy, Gutenberg.
Introduction to Engineering Profession: Engineering work is all around you - Engineering as a
profession and common traits of Good Engineers – History of Engineering Disciplines – Functions
of Engineering.

UNIT II  CAREER PATHS OF ENGINEER AND PREPARING FOR AN 8
ENGINEERING CAREER
Career Paths for Engineers: The corporate ladder, The independent entrepreneur, Employment
Opportunities in Government, The military, Engineering and social service abroad, The
Engineering Professor, Graduate work outside of engineering, A mix of two or more of the first six
options.
Preparing for an Engineering Career: Making the Transition from High School to College -
Budgeting Your Time - Daily Studying and Preparation - Getting Involved with an Engineering
Organization - Your Graduation Plan - Other Considerations.

UNIT III  PROFILES OF ENGINEERS 4
Initial Career Profiles of Civil, Mechanical, Electrical, Electronics, Instrumentation, Communication,
Information Technology, Computer Engineering Graduates.

UNIT IV  OVERVIEW OF OBE AND CBCS 4
Graduate attributes of Washington Accord – Programme Specific Criteria (PSC) – Programme
Educational Objectives (PEOs) – Programme Outcomes (POs) – Course Outcomes (COs) –
CBCS : Course categories - Scheme of instruction, Assessment and Evaluation.

UNIT V  LEARNING AND CREATIVE THOUGHT 7
Introduction: The successful engineering student - the engineering curriculum - curriculum
planning and management - adapting to the college classroom.
The learning process: the nature of learning - information processing and memory - determinants
of efficient learning - practical suggestions for learning.
Differences in the way people think: The four-quadrant model of thinking - hindrances to
problem solving.
On Creativity: What is creativity? - the nature of creativity - characteristics of creative people - the creative process - overcoming obstacles to creative thinking.

L: 30 TOTAL: 30 PERIODS

REFERENCES

WEB RESOURCES
www.ieagreements.org/IEA-Grad-Attr-Prof-Competencies.pdf
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: use the drawing instruments effectively. (K2, S4, A3)

CO 2: draw the projections of points, straight lines, planes. (K2, S3, A3)

CO 3: construct the projections of various solids in different positions. (K3, S3, A3)

CO 4: draw the sectional views of various solids and construct the true shape of the section. (K3, S3, A3)

CO 5: identify and draw the surface areas of simple solids. (K3, S3, A3)

CO 6: draw perspective views of simple solids and draw the orthographic views of simple objects. (K3, S3, A3)

UNIT I  PROJECTION OF POINTS, LINES AND PLANE SURFACES  12

Drawing Instruments- IS specifications on lines- drawing sheets- Printing letters and dimensioning- scales - First angle projection. (Not for examination).

Projections of points and straight lines located in the first quadrant-Determination of true lengths and true inclinations. Projections of regular polygonal surfaces and circular lamina inclined to both reference planes.

UNIT II  PROJECTION OF SOLIDS  12

Projections of simple solids - axis inclined to one reference plane - change of position method.

UNIT III  SECTION OF SOLIDS  12

Sectioning of simple solids - cutting planes inclined to one reference plane and perpendicular to the other.

UNIT IV  DEVELOPMENT OF SURFACES AND ISOMETRIC PROJECTIONS  12

Development of lateral surfaces of simple and truncated solids - Principles of isometric projection and view of simple solids - truncated prism and pyramids.

UNIT V  PERSPECTIVE PROJECTIONS AND ORTHOGRAPHIC PROJECTIONS  12

Perspective projection of cube, prisms and pyramids by visual ray method and vanishing point method. Orthographic projection – simple objects with straight and curved surfaces.

L: 30 P: 30 TOTAL: 60 PERIODS

TEXT BOOKS


REFERENCES

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO1: demonstrate the properties of light waves. (K2, S3)
CO2: interpret the production of ultrasounds and how the velocity of ultrasounds varies with respect to medium.(K2, S3)
CO3: illustrate the mechanical and electrical properties of materials. (K2, S3)

LIST OF EXPERIMENTS

1. Determination of thickness of a thin wire – Air wedge method.
2. Determination of velocity of sound and compressibility of the liquid – Ultrasonic Interferometer.
3. Determination of Dispersive power of a prism using Spectrometer.
5. Torsional pendulum – Determination of Moment of Inertia of the disc and Rigidity modulus of the material of the wire.
6. Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge.
10. Determination of temperature coefficient of resistance.

P:15 TOTAL: 15 PERIODS

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: estimate the amount of hardness of the water sample (K5, S3)
CO 2: determine the rate of corrosion (K5, S3)
CO 3: synthesize a polymer and to determine molecular weight of the polymer (K6, S3)
CO 4: synthesize silver nano particles (K6,S6)
CO 5: quantify different ions by different analytical techniques (K5,S3)

LIST OF EXPERIMENTS

1. Estimation of hardness of water sample by EDTA method
2. Rate of corrosion- weight loss method
3. Synthesis of urea-formaldehyde resin
4. Determination of molecular weight of a polymer – Oswald’s viscometer
5. Synthesis and characterization of silver nano particles.
6. Estimation of iron (Fe^{2+}) in water sample by dichrometry
7. Estimation of hydrochloric acid by conductometric method
8. Estimation of mixture of acids by conductometric method

P: 15 TOTAL: 15 PERIODS

• A minimum of FIVE experiments shall be offered.
• Laboratory classes on alternate weeks for Physics and Chemistry.
REFERENCES

PART A - MECHANICAL LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: prepare basic carpentry jobs (at least three joints). (K3,S2,A2)
CO 2: prepare the welded joint (minimum three) using arc and gas welding. (K3,S2,A2)
CO 3: Machine metals using lathe, shaper and drilling machine (each one job). (K3,S2,A2)

UNIT I  CARPENTRY PRACTICES
Study of carpentry tools – preparation of joints like half lap, Tee and dove tail in wood.

UNIT II  WELDING
Study of welding tools – Preparation of welded joints with Mild steel specimen like lap, butt and tee joints using ARC and Gas welding. (any one exercise should be given using Gas welding among three)

UNIT III  BASIC MACHINING PRACTICES
Simple turning and taper turning using lathe – use of shaper and drilling machine for basic operations (Minimum three exercises should be given for students)

P: 15 TOTAL: 15 PERIODS

TEXT BOOK

REFERENCES
PART – B ELECTRICAL AND ELECTRONICS LABORATORY

COURSE OUTCOMES
Upon completion of this course, the students will be able to,
CO 1: develop simple residential wiring circuits. (K6)
CO 2: calculate the basic electrical quantities. (K4)
CO 3: identify the value of resistance using appropriate methods. (K4, A4)
CO 4: realize the fundamentals of Boolean algebra using digital logic gates. (A4)
CO 5: practice soldering to design PCB for electronic circuits. (A5)

I. ELECTRICAL ENGINEERING PRACTICE
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
5. Measurement of energy using single phase energy meter.

II. ELECTRONICS ENGINEERING PRACTICE
1. Study of Electronic components and equipments – Resistor, colour coding, measurement of AC signal parameters (peak-peak, rms period, frequency) using CRO
2. Study of logic gates AND, OR, XOR and NOT.
4. Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

P: 15 TOTAL: 15 PERIODS

REFERENCES
15CE21C PROFESSIONAL ENGLISH (Common to all B.E. / B.Tech. Degree Programmes) L T P C 3 0 0 3

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: contribute the lingual power to frame sentences in different context. (A2)
CO 2: write effectively in any Professional context. (A2)
CO 3: acquire the skills related to Group discussion. (A2)
CO 4: communicate and respond in different social and professional contexts. (A3)
CO 5: recall the acquired skills in solving competitive exam. (K3)

UNIT I
Phrasal Verbs (Based on root words: call, come, get, look, put, run, and take) - Foreign Words and Phrases (from the given list) - Listening to audio files and finding the technical words and framing different sentences - Channel conversion - Descriptive writing on various charts.

UNIT II
Idioms and Phrases (with animal names from the given list) - Report writing (types-structure-stages in report writing-model report) - Job Application Letter with curriculum vitae.

UNIT III
One word substitution (from the list given) Group Discussion (Why is GD a part of selection process? - Structure of GD - Strategies in GD - Team Work - Body Language - Video Samples-GD).

UNIT IV
Choosing a suitable connotation (from the given list) - Note making - Preparing Circular and Minutes of meeting - Listening to TED Talks - Giving opinion on the given TED Talks and interviewing the TED talkers.

UNIT V
Error Spotting (Tense, Relative Pronouns, Conjunctions, Sentence Structure, Adverb Placement) Sentence Completion - Reading comprehension.

L: 45 TOTAL: 45 PERIODS

Activity: Each student should read the suggested fiction for oral assignment.

TEXT BOOK

REFERENCES

Listening files: Audio files from net sources and softwares: ODLL, Globerena.
15CE22C CALULCUS AND TRANSFORMS L T P C
3 2 0 4

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: evaluate area and volume of objects using double and triple integrals. (K3)
CO2: analyze the concepts related to vector calculus and apply them in engineering
field.(K3)
CO 3: find the envelopes of various curves. (K1)
CO 4: apply Laplace Transforms in engineering field. (K3)
CO 5: solve difference equations using Z-Transforms. (K3)

UNIT I MULTIPLE INTEGRALS
Double integration - Cartesian and polar coordinates - Change of order of integration - Change of
variables between Cartesian and polar coordinates - Area as double integral; Triple integration in
Cartesian coordinates; Volume as triple integral.

UNIT II VECTOR CALCULUS
Gradient, Divergence and Curl – Directional derivatives – Irrotational and Solenoidal vector fields;
Vector integration – Line, Surface and Volume Integrals - Green’s theorem in a plane, Gauss
divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes
and rectangular parallelopipeds.

UNIT III DIFFERENTIAL CALCULUS
Curvature in Cartesian, parametric and polar forms - Centre, radius and circle of curvature –
Evolutes – Envelopes – Evolutes as envelope of its normal.

UNIT IV LAPLACE TRANSFORMS
Definition of Laplace transform and its inverse - Transforms of elementary functions – Properties
(excluding proofs) – Transforms of periodic functions - Initial and Final value theorems –
Convolution theorem (excluding proof) - Solutions of linear ordinary differential equations of
second order with constant coefficients.

UNIT V Z – TRANSFORMS
Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Formation of
difference equations – Solutions of difference equations using Z-transform.

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS
Delhi, 2012.

REFERENCES
4. Anthony Croft, Robert Davison, Martin Hargreaves James Flint, “Engineering Mathematics:
A Foundation for Electronic, Electrical, Communications and System Engineers”, 4th
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: summarize the working principles and limitations of pumps, gauges and other vacuum system components.(K2)
CO 2: infer the measurement of optical properties of surfaces and materials. (K2)
CO 3: express the thermal properties of materials. (K2)
CO 4: predict the mechanism by which the electric field interacts with Dielectric material and their applications. (K2)
CO 5: describe the advanced materials' properties which are used in engineering applications and devices.(K1)

UNIT I VACUUM SCIENCE AND TECHNOLOGY


UNIT II PHOTOMETRY


UNIT III THERMAL PHYSICS


UNIT IV DIELECTRIC MATERIALS

Types of Polarization – electronic, ionic, orientation and space charge polarization – frequency and temperature dependence of polarization; Internal field – Clausius-Mosotti relation (derivation); dielectric loss, dielectric breakdown, Uses of dielectric materials in capacitor and transformer.

UNIT V ADVANCED ENGINEERING MATERIALS

Nano Phase materials - Shape memory alloys - Metallic glass - Fibre reinforce plastics - Advanced ceramics materials - MEMS.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
15CE24C  CHEMISTRY FOR CIVIL ENGINEERING  L  T  P  C
3 0 0 3

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: analyze the water quality parameters. (K4)
CO 2: apply the principles of electrochemistry in electroplating. (K3)
CO 3: identify various protective coating methods and adhesives. (K3)
CO 4: select proper engineering materials for desired engineering application. (K3)
CO 5: select proper building materials for desired structural application. (K3)

UNIT I  WATER ANALYSIS  9
Water quality parameters and standards for drinking and construction - water quality parameter analysis – spectrophotometric determination of iron in water – flame photometric determination of Na and K in water.

UNIT II  ELECTROCHEMISTRY AND ITS APPLICATION  9

UNIT III  PROTECTIVE COATINGS AND ADHESIVES  9

UNIT IV  ENGINEERING MATERIALS  9

UNIT V  CHEMISTRY OF BUILDING MATERIALS  9
Manufacture, properties, setting and hardening of lime, cement and plaster of Paris; special cement; polymers for building industries – flooring, roofing, special coatings.

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
15CE25C   C PROGRAMMING FOR ENGINEERS  L T P C
(Common to all B.E. / B.Tech. Degree Programmes)  3 0 0 3

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: recognize the system fundamentals and the role of hardware components of the
Computer. (K3)
CO 2: apply the basic concepts and solve simple problems by analyzing the logics of
conditional statements and looping constructs. (K3)
CO 3: handle similar types of data using array and utilize their functionality. (K3)
CO 4: appreciate the call by value and call by reference features in functions. (K5)
CO 5: design programs involving their own derived data types, pointers, memory allocation
concepts. (K4)
CO 6: handle the file contents with access permissions. (K3)

UNIT I   COMPUTER FUNDAMENTALS  10
Classification of Computers – Basic Computer organization – Number Systems – Problem

UNIT II  BASIC C PROGRAMMING  9
Overview of C Program – Constants, Variables and Data Types – Operators and Expressions –
Managing Input and Output operations – Decision Making and Branching – Decision making and
Looping.

UNIT III  ARRAYS AND FUNCTIONS  9
Arrays: One dimensional arrays – Two dimensional arrays – Multi dimensional arrays. Character
arrays and Strings: Declaring and initializing String Variables – Comparison of two strings – String
handling functions. User defined Functions: Definition – Declaration – Function calls – Category of
Functions – Recursion - Storage Classes.

UNIT IV  STRUCTURES AND POINTERS  9
Structures and Unions: Definition – Declaration – Accessing structures – Initialization of structures
– Arrays of structures – Arrays within Structure – Structures within Structures - Structures and
functions - Unions. Pointers: Initialization – Pointers and arrays- Array of pointers – Pointers as
function arguments – Pointers to functions – Pointers and Structure.

UNIT V  FILES AND DYNAMIC MEMORY ALLOCATION  8
File management in C – Defining and opening a file – closing a file - Input and Output operations
on file – Error handling during IO operations – Random access to files – Command line
Arguments. Dynamic memory allocation: Allocating a block of memory - Allocating a multiple block
of memory – Releasing the used space – Altering the size of a block

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
   Education Inc., 2005.
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: use the basic concept of force systems and solve problems.

CO 2: implement the knowledge acquired in supports, reactions, equilibrium of rigid bodies for solving problems.

CO 3: predict centre of gravity, moment and product moment of inertia of simple configurations.

CO 4: solve practical problems on Projectiles, Newton’s laws, work-energy, impulse momentum and impact on elastic bodies.

CO 5: apply the principles of friction and rigid body dynamics to analyze and solve problems.

UNIT I  BASICS AND STATICS OF PARTICLES  15

UNIT II  EQUILIBRIUM OF RIGID BODIES  15

UNIT III  PROPERTIES OF SURFACES AND SOLIDS  15

UNIT IV  DYNAMICS OF PARTICLES  15


UNIT V  FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS  15
Frictional force – Laws of Coulomb friction – Simple contact friction – Rolling resistance – Belt friction – Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion of simple rigid bodies such as cylinder, disc/wheel and sphere.

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES
15CE27C PHYSICS AND APPLIED CHEMISTRY LABORATORY

PART A – PHYSICS LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: demonstrate the optical properties of waves. (K2, S3)
CO 2: analyze the characteristics of semiconducting materials and devices. (K3,S3)
CO 3: quantify the acceleration due to gravity (g). (K2,S3)
CO 4: analyze the thermal properties of materials. (K3,S3)

LIST OF EXPERIMENTS

1. a. Determination of wave length of Laser source.
   b. Particle size determination using Diode Laser.
   c. Determination of Numerical aperture and acceptance angle of an optical fiber.
2. Determination of Band Gap of a semiconductor material.
6. Determination of g using compound pendulum.
7. Determination of Hall Coefficient.
9. Characteristics of LED.
10. Study of V-I characteristics of a solar cell.

P:15 TOTAL: 15 PERIODS

PART - B APPLIED CHEMISTRY LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: determine various water quality parameters (K5, S3)
CO 2: quantify the amount of metal ions in water sample by different analytical techniques (K6, S3)
CO 3: determine the amount of acid by pH metric method (K5, S3)
CO 4: produce a metal coating on the base metal.(K3, S6)
CO 5: estimate the free acid value of driers in paints (K5,S3)
CO 6: synthesize a polymer used as a building material. (k6,S6)

LIST OF EXPERIMENTS

1. Qualitative analysis of nitrate, phosphate, chloride and sulphate in water sample.
2. Estimation of iron (Fe^{2+}) by spectrophotometric method.
3. Estimation of sodium by flame photometry.
4. Estimation of amount of silver ion in water – Conductometric method.
5. Estimation of iron (Fe^{2+}) in ore by potentiometric method.
7. Electroplating of copper on mild steel plate.
8. Estimation of free acid value of driers in paints.

P:15 TOTAL: 15 PERIODS

- A minimum of FIVE experiments shall be offered.
- Laboratory classes on alternate weeks for Physics and Chemistry.
REFERENCES
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: solve the given problem using the syntactical structures of C language. (K3)

CO 2: develop, execute and document computerized solution for various logic based
problems using the flow control features of C language. (K3)

CO 3: enhance the programming skills in C by discriminating constants, variables and
arrays and the functionality. (K3)

CO 4: learn about the connection between function return values and variables. (K5)

CO 5: develop programs using string manipulation and file manipulation functions. (K3)

Simple programs

1. Solve problems such as temperature conversion, student grading, interest calculation.
2. Solving the roots of a quadratic equation
3. Designing a simple arithmetic calculator. (Use switch statement)
4. Given distance traveled by a vehicle as \( d = ut + \frac{1}{2}at^2 \), where ‘u’ and ‘a’ are the initial
   velocity and acceleration. Calculate the distance traveled for different time intervals

Programs using different control structures

5. Performing the following operations:
   a. Generate Pascal’s triangle.
   b. Construct a Pyramid of numbers.
6. Generation of the first ‘n’ terms of the Fibonacci sequence and prime sequence.
8. Finding the 2’s complement of a binary number.

Programs using arrays

9. Performing the following operations:
   a. Matrix addition.
   b. Transpose of a matrix.
   c. Matrix multiplication by checking compatibility.

Programs using string manipulation

10. Performing the following operations to a string:
    a. To insert a sub-string into main string at a given position.
    b. To delete ‘n’ characters from a given position in a string.
    c. To replace a character of string either from beginning or ending or at a specified
        location.

Programs using functions

11. Performing the following operations: (Use recursive functions)
    a. To find the factorial of a given integer.
    b. To find the GCD (Greatest Common Divisor) of two given integers.
    c. To solve Towers of Hanoi problem.

Programs using files

12. Performing the Student Information Processing using Structures and File handling
    concepts.

P: 30 TOTAL: 30 PERIODS
15CE29C COMPUTER AIDED BUILDING DRAWING LABORATORY L T P C 0 0 2 1

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: generalize basic concepts of various elements of Residential / Institutional / Workshop buildings.
CO 2: identify and practice simulation software to draw truss structures, plan, elevation and sectional view of a building.

LIST OF EXPERIMENTS
1. Buildings with load bearing walls (Flat and pitched roof) – Including details of doors and windows
2. RCC framed structures
3. Industrial buildings – North light roof structures – Trusses
4. Perspective view of one and two storey buildings

P: 30 TOTAL: 30 PERIODS

TEXT BOOKS

REFERENCES

LIST OF EQUIPMENTS
(For a batch of 30 students)

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Description of Equipments</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Computer system of Pentium IV or Equivalent</td>
<td>1 for each student</td>
</tr>
<tr>
<td>2.</td>
<td>Licensed version of any reputed Analysis, Design &amp; Drafting software</td>
<td>1 copy for a set of 3 student</td>
</tr>
</tbody>
</table>