# Programme Structure

# School of Polytechnic

## Diploma in Computer Science & Engineering

## Programme Code: SPB01

## Batch: 2023-2026

**Vision of the University**

To be recognized as an Institution of excellence, facilitating learning, fostering creativity, knowledge creation, innovations, consultancy and leadership in multiple areas to build a conscious community that will positively impact living beings for a sustainable future.

**Mission of the University**

1. **Offers a wide range of Undergraduate and Post graduate Courses.**
   To create conducive environment for an interactive and application oriented experiential learning making the Institute a preferred destination for work and study.
2. **Research, Innovation, Consultancy & Entrepreneurial Culture**
   To Foster creativity, research and innovation orientation in students and faculty in basic and applied areas in all of its disciplines, provide cost effective solutions and nurture entrepreneurial capabilities to accelerate growth.
3. **Social Relevance with local actions on global thoughts**
   To act as a catalyst in social change by developing academic, social, political, technological, scientific, industrial and business leadership in the spirit "Think Globally and Act Locally"; by providing ample opportunities to develop team spirit, sportsmanship and love for culture and national heritage.

**Core Values**

**Integrity**
**Leadership**
**Diversity**
**Community**

**Vision of the School of Polytechnic**

To become a center of excellence for providing quality and value based education in the field of diploma engineering that will produce skilled technocrats to meet industry requirements.

**Mission of the School of Polytechnic**

- To provide technical knowledge and skills by using latest engineering tools.
- To facilitate industry-institute interaction to explore the industrial knowledge of the students.
- To inculcate ethical and professional values among students.
- To impart quality education to the students coming from rural parts and to conduct different curricular & co-curricular activities to enhance the academic.

**Core Values**

**Integrity**
**Leadership**
**Diversity**
**Community**

## Programme Educational Objectives (PEO's)

**PEO's 1.** To provide a solid foundation in computer science and engineering along with excellent communication and entrepreneurship skills for addressing societal challenges.

**PEO's 2.** To equip students with comprehensive scientific and engineering knowledge to analyze, design, and develop innovative solutions for real-world problems.

**PEO's 3.** To develop engineers with robust technical expertise, capable of overcoming diverse challenges in the industry or pursuing advanced studies.

**PEO's 4.** To inspire students to embrace lifelong learning, leadership, teamwork, and ethical values, enabling them to stay updated with the latest advancements in the field and contribute effectively to society.

## PROGRAMME OUTCOMES (POs)

**PO 1.** Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

**PO 2.** Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.

**PO 3.** Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

**PO 4.** Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

**PO 5.** Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

**PO 6.** Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

**PO 7.** Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

## PROGRAMME SPECIFIC OUTCOMES (PSOs)

**PSOs 1**. An ability to specify, designs, and analyse software systems and applications that efficiently solve complex computational problems.

**PSOs 2.** An ability to analyse and design algorithms, data structures, and software architectures, integrating advances in computing and related disciplines to deliver innovative technological solutions.

**PSOs 3.** An ability to specify, design, implement, and test software applications and systems using state-of-the-art programming languages, tools, and methodologies.

**PSOs 4.** An ability to analyse, design, and implement learning in fields such as artificial intelligence, data science, cyber security, and networked systems to address real-world challenges.

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF ENGINEERING & TECHNOLOGY

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - I**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | DE-ASH-23101 | *Applied Mathematics -1 | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 45 |
| 2 | DC | DE-ASH-23102 | *Applied Physics | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 45 |
| 3 | DC | DE-CSE-23103 | Concept of Programming Using C | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 45 |
| 4 | DC | DE-CSE-23104 | Fundamental of Computer and Information T | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 45 |
| 5 | OE | DE-EE-23105 | Basics of Electrical & Electronics Engineerin | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 45 |
| 6 | AE | DE-ASH-23104 | *Communication Skill H & E - I | 2 | 0 | 0 | 2 | 2 | 50 | 50 | 100 | 45 |
| 7 | DC | DE-ASH-23112 | *Applied Physics Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 45 |
| 8 | DC | DE-CSE-23113 | Programming Using C Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 45 |
| 9 | DC | DE-CSE-23114 | Fundamental of Computer and Information T | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 45 |
| 10 | OE | DE-EE-23115 | Basics of Electrical & Electronics Engineerin | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 45 |
| 11 | AE | DE-ASH-23114 | *Communication Skill H & E - I Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 45 |
| Total | | | | 17 | 0 | 14 | 31 | 24 | 600 | 500 | 1100 | 495 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF ENGINEERING & TECHNOLOGY

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - II**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | DE-ASH-23201 | *Applied Mathematics - II | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 2 | DC | DE-CSE-23202 | OOPs using C++ | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 3 | DC | DE-CSE-23203 | Introduction of Web Designing | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 4 | DC | DE-ASH-23204 | Applied Chemistry | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 5 | DC | DE-CSE-23212 | OOPs using C++ Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| 6 | DC | DE-CSE-23213 | Introduction of Web Designing Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| 7 | DC | DE-ASH-23214 | Applied Chemistry Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 8 | AE | DE-ASH-23215 | Professional Communication Skill H & E Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 9 | SE | DE-CSE-23216 | *Digital Marketing Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 10 | SE | DE-CSE-23217 | Office Automation Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| Total | | | | 12 | 0 | 16 | 28 | 20 | 560 | 440 | 1000 | 400 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF POLYTECHNIC

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - III**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | SPB01230301 | Applied Mathematics-III | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 2 | DC | SPB01230302 | Advance Web Designing | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 3 | DC | SPB01230303 | Data Structure Using C | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 4 | OE | SPB01230304 | Data Communication And Computer Networks | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 5 | OE | SPB01230305 | Digital Electronics & Logic Design | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 6 | VAC | SPB01230306 | Environment Studies | 2 | 0 | 0 | 2 | 1 | 50 | 50 | 100 | 40 |
| 7 | DC | SPB01230352 | Advance Web Designing Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 8 | DC | SPB01230353 | Data Structure Using C Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 9 | OE | SPB01230354 | Data Communication And Computer Networks Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 10 | OE | SPB01230355 | Digital Electronics & Logic Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 11 | VAC | SPB01230356 | Environment Studies Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| Total | | | | 17 | 0 | 10 | 27 | 20 | 600 | 500 | 1100 | 440 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF POLYTECHNIC

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - IV**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | SPB01230401 | Computer Graphics & Multimedia | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 2 | DC | SPB01230402 | Data Base management system | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 3 | DC | SPB01230403 | Object Oriented Programming using JAVA | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 4 | DC | SPB01230404 | Operating System | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 5 | VAC | SPB00230405 | *Universal Human Values | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 6 | DC | SPB01230451 | Computer Graphics & Multimedia Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 7 | DC | SPB01230452 | Data Base management system Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 8 | DC | SPB01230453 | Object Oriented Programming using JAVA Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| 9 | DC | SPB01230454 | Operating System Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| 10 | SE | SPB01230460 | Introduction to Data Analytics using Advance Excel Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| Total | | | | 15 | 0 | 16 | 31 | 20 | 550 | 450 | 1000 | 400 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF POLYTECHNIC

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - V**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | SPB01230501 | Internet of Things | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 2 | DC | SPB01230502 | Software Engineering | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 3 | DC | SPB01230503 | Web Development using PHP | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 4 | DC | SPB01230504 | Python Programming | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 5 | OE | SPB01230505 | Computer Architecture And Hardware Maintenance | 3 | 0 | 0 | 3 | 2 | 50 | 50 | 100 | 40 |
| 6 | DC | SPB01230551 | Internet of Things Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 7 | DC | SPB01230553 | Web Development using PHP Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 8 | DC | SPB01230554 | Python Programming Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 9 | OE | SPB01230555 | Computer Architecture And Hardware Maintenance Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 10 | DC | SPB01230560 | Summer Internship or Industrial training | 0 | 0 | 0 | 0 | 3 | 0 | 100 | 100 | 40 |
| Total | | | | 15 | 0 | 8 | 23 | 20 | 490 | 510 | 1000 | 400 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF POLYTECHNIC

### SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

**Session- 2023-26** **Semester - VI**

| S. No | Status | Paper Code | Subjects | Study Scheme Lec / Week | | | Hours | Credits | CIE | ESE | Total | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | | | | | |
| 1 | DC | SPB01230601 | Development of Android Applications | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 2 | DC | SPB01230602 | Cloud Computing | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 3 | DE | SPB01230603 / SPB01230604 / SPB01230605 | Elective-<br>Dot Net Technologies<br>Data Science using ML<br>Advanced Java | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 4 | SE | SPB01230606 | Industrial Management and Entrepreneurship Development | 3 | 0 | 0 | 3 | 3 | 50 | 50 | 100 | 40 |
| 5 | DC | SPB01230651 | Development of Android Applications Lab | 0 | 0 | 4 | 4 | 2 | 60 | 40 | 100 | 40 |
| 6 | DC | SPB01230652 | Cloud Computing Lab | 0 | 0 | 2 | 2 | 1 | 60 | 40 | 100 | 40 |
| 3 | DE | SPB01230653 / SPB01230654 / SPB01230655 | Elective-<br>Dot Net Technologies Lab<br>Data Science using ML Lab<br>Advanced Java Lab | 0 | 0 | 4 | 4 | 2 | 50 | 50 | 100 | 40 |
| 8 | DC | SPB01230663 | Project | 0 | 0 | 4 | 4 | 3 | 120 | 80 | 200 | 80 |
| Total | | | | 12 | 0 | 14 | 26 | 20 | 490 | 410 | 900 | 360 |

# SDGI GLOBAL UNIVERSITY, GHAZIABAD

## SCHOOL OF POLYTECHNIC

### SCHEME OF STUDIES FOR DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

### Credit Analysis Report

**Session- 2023-26**

| S. No | Status | Semester 1 | Semester 2 | Semester 3 | Semester 4 | Semester 5 | Semester6 | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | DISCIPLINE CORE | 17 | 17 | 11 | 15 | 14 | 9 | 83 |
| 2 | DISCIPLINE ELECTIVE | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 3 | OPEN ELECTIVE | 4 | 0 | 7 | 0 | 3 | 0 | 14 |
| 4 | SKILL ENHANCEMENT | 0 | 2 | 0 | 2 | 0 | 3 | 7 |
| 5 | ABILITY ENHANCEMENT | 3 | 1 | 0 | 0 | 0 | 0 | 4 |
| 6 | VALUE ADDED COURSE | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| 7 | PROJECT/TRAINING | 0 | 0 | 0 | 0 | 3 | 3 | 6 |
| Total | | 24 | 20 | 20 | 20 | 20 | 20 | 124 |

# Semester 1st

## SCHOOL OF ENGINEERING & TECHNOLOGY

## APPLIED MATHEMATICS - I

**(DE-ASH-23101)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

This course offers a fundamental understanding of elementary mathematics and its applications in engineering problem-solving. Students will learn to utilize key mathematical functions, including logarithms, partial fractions, matrices, as well as basic 2D geometry and curves. By mastering these concepts, students will gain the necessary skills to address engineering challenges across all disciplines effectively.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify arithmetic or geometric progressing series and Utilize Determinants and Cramer's Rule to solve systems of linear equations and analyse engineering problems that involve multiple variables, leading to efficient solutions in real-world scenarios.
2. Incorporate Vectors and Complex Numbers to address various engineering problems, allowing them to analyse AC circuits, control systems, and other phenomena that involve harmonic oscillations and phase shifts.
3. Apply trigonometric functions (sine, cosine, tangent, cosecant, secant, cotangent) and inverse trigonometric functions to model and analyse periodic phenomena, such as oscillations and waves, determining angles and distances in real-world applications like navigation, surveying, and control systems.
4. Apply differential calculus to analyse functions, identify their domains and ranges, and determine continuity and differentiability using elementary tests. They will apply various methods to find derivatives, including trigonometric, exponential, and logarithmic differentiation, as well as derivatives of inverse trigonometric and implicit functions.
5. Apply Higher Order differential calculus to find tangents, normals, points of maxima/minima, identify increasing/decreasing functions, and analyse rates, measures, velocity, acceleration, errors, and approximations in various engineering applications.

## DETAILED CONTENTS

**UNIT 1: Algebra** **8 Periods**

1.1 Series : AP and GP; Sum, nth term, Mean

1.2 Matrices and Determinants : Matrix, Types and basic properties, Elementary properties of determinant of order 2 and 3, , Consistency of equation, Crammer's rule

**UNIT 2: Algebra -II** **8 Periods**

2.1 Complex number: Complex numbers, Representation, Modulus and amplitude

Demoivre theorem, its application in solving algebraic equations.

2.2 Addition and subtraction of Vectors, Resolution of vectors, Dot and Cross product of Vectors

**UNIT 3: Trigonometry and Inverse Trigonometric Functions** **10 Periods**

3.1 Trigonometric Functions and Identities.

3.2 Inverse Trigonometric functions : Simple case only

**UNIT 4: Differential Calculus - I** **16 Periods**

4.1 Functions, limits, continuity, functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

4.2 Methods of finding derivative, Trigonometric functions, exponential function, Function of a function, Logarithmic differentiation, Differentiation of Inverse trigonometric function, Differentiation of implicit functions.

**UNIT 5: Differential Calculus - II** **16 Periods**

5.1 Higher order derivatives, Simple applications.

5.2 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration.

## RECOMMENDED BOOKS


1. **Applied Mathematics-I** by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut
2. **Elementary Engineering Mathematics** by BS Grewal, Khanna Publishers, New Delhi
3. **Engineering Mathematics, Vol I & II** by SS Sastry, Prentice Hall of India Pvt. Ltd.,
4. **Applied Mathematics-I** by Chauhan and Chauhan, Krishna Publications, Meerut.


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Identify and explain** the concept of determinants and **apply** for solving linear simultaneous equations. | **K1 & K3** |
| **CO2** | **Demostrate** the basics of vectors algebra and complex numbers and its **applications** in engineering and physics. | **K1 & K3** |
| **CO3** | **Demostrate** the basics of trigonometric and inverse trigonometric functions and its **applications** in engineering and physics. | **K1 & K3** |
| **CO4** | **Apply** differential calculus to analyse functions, **identify** their domains and ranges, and determine continuity and differentiability using elementary tests. | **K2 & K3** |
| **CO5** | **Identify** the application of differential calculus and **apply** for evaluating maxima, minima, Increasing/ decreasing function etc. | **K3 & K5** |

## SCHOOL OF ENGINEERING & TECHNOLOGY

## APPLIED PHYSICS

**(DE-ASH-23102)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

Physics is a field that explores various subjects relevant to our surroundings. It seeks to understand the natural world through observation and predicting how objects interact. The course emphasizes a strong understanding of physical laws and their practical applications in engineering and technology across different disciplines. Through this study, students gain insights into the behaviour of objects and their relevance in real-world scenarios.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate a thorough understanding of fundamental and derived physical quantities, systems of units (FPS, CGS, SI), and conversion between different unit systems. They will be proficient in handling measurement errors, accuracy, and precision of instruments, along with representation and operations with scalar and vector quantities.
2. Analyse various forces and their effects on linear and circular motion. They will understand the principles of conservation of linear momentum and conservation of mechanical energy, applying them to real-world examples involving impulsive forces, circular motion, and work-energy transformations.
3. Demonstrate the concepts related to work, friction, power, and energy, along with their practical applications in various engineering scenarios. They will be able to analyse and solve problems involving these principles and apply them to real-world situations.
4. Demonstrate the concepts of translatory and rotational motions, torque, angular momentum, and moment of inertia. They will apply these principles in solving problems related to rotational kinetic energy, rolling motion, and the comparison of linear and rotational motion.
5. Demonstrate the concepts of elasticity, stress, strain, and different types of moduli of elasticity. They will apply Hooke's law and understand stress-strain curves. Additionally, they will learn about pressure, surface tension, viscosity, and fluid dynamics, including the application of Bernoulli's theorem and Reynold's number.

## DETAILED CONTENTS

**UNIT 1: Fundamentals of Units, Measurement, Errors and Vector Analysis** **12 Periods**

1.1 Need of Measurement, physical Quantity - fundamental and derived, systems of units (FPS, CGS and SI units), Dimensions and dimensional formulae of physical quantities. conversion of numerical values of physical quantities from one system of units into another

1.2 Error in measurement, accuracy and precision of instruments, percentage error, Combination of errors in addition, subtraction, multiplication, division and powers, rules for representing significant figures in calculation.

1.3 Scalar and vector quantities – examples, representation of vector, types of Vectors, Unit Vector, Vector Addition and Subtraction, Triangle and Parallelogram law (Statement only), difference between vector and scalar addition using examples, Scalar and Vector Product, Resolution of Vectors using

the example of stationary object, falling object, moving object.

**UNIT 2: Force and Motion** **10 Periods**

2.1 Force, Momentum, Statement of Conservation of linear momentum, discuss using examples such as recoil of gun, Impulsive force and its examples,

2.2 Circular motion (Uniform and Non-uniform), definition of angular, displacement, angular velocity, angular acceleration, frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration (numerical practice)

Centripetal and centrifugal forces with examples such as banking of roads and bending of cyclist, Principle of centrifuge, Application of various forces in lifts, cranes, large steam engines and turbines.

**UNIT 3: Work, Power and Energy** **10 Periods**

3.1 Work: and its units, examples of zero work, positive work and negative work, conservative and non-conservative force,

Friction: modern concept, types, laws of limiting friction, Coefficient of friction and its Engineering Applications, Work done in moving an object on horizontal and inclined plane for rough and plane surfaces with its applications

Application of Friction in brake system of moving vehicles, bicycle, scooter, car trains etc.

3.2 Power and its units, calculation of power in numerical problems

3.3 Energy and its units: Kinetic energy and potential energy with examples and their derivation, work energy theorem, Principle of conservation of mechanical energy for freely falling bodies, examples of transformation of energy.

**UNIT 4: Rotational Motion and Gravitational Force** **10 Periods**

4.1 Concept of translatory and rotatory motions with examples, Definition of torque with examples, Angular momentum, Conservation of angular momentum and its examples

4.2 Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only). Concept of Fly wheel.

4.3 Rotational kinetic energy, Rolling of sphere on the slant plane, Comparison of linear motion and rotational motion, Application of rotational motions in transport vehicles, and machines

4.4 Gravitational force, Acceleration due gravity and its variation

**UNIT 5: Properties of Matter & Thermodynamics** **14 Periods**

5.1 Elasticity: definition of stress and strain, different types of moduli of elasticity, Hooke's law, significance of stress strain curve

5.2 Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications

5.3 Surface tension: concept, its units, angle of contact, Capillary action and determination of surface tension from capillary rise method, applications of surface tension, effect of temperature and impurity on surface tension

5.4 Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems.

5.5 Concept of fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's Theorem and their applications

5.6 Difference between heat and temperature, Modes of transfer of heat (Conduction, convection and radiation with examples), Different scales of temperature and their relationship, Isothermal and Adibatic process, Zeroth, First and second law of thermodynamics, Heat engine (concept Only), Carnot

cycle, Application of various systems of thermometry in refrigeration and air-conditioning etc

## RECOMMENDED BOOKS


1. **Text Book of Physics for Class XI** (Part-I, Part-II); N.C.E.R.T., Delhi
2. **Concepts in Physics** by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
3. **Comprehensive Practical Physics**, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd.
4. **Engineering Physics** by PV Naik, Pearson Education Pvt. Ltd, New Delhi
5. **Engineering Physics** by DK Bhhatacharya & Poonam Tandan; Oxford University Press.
6. **Modern Engineering Physics** by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications
7. **Physics-I** by V. Rajendran, Tata McGraw-Hill raw Hill publication, New Delhi.


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | **Course Outcomes** | **Bloom's Knowledge level** |
|---|---|---|
| **CO1** | **Demonstrate** a thorough understanding of fundamental and derived physical quantities, systems of units, inter conversion, proficient in handling measurement errors, along with representation and operations with scalar and vector quantities. | **K2 & K3** |
| **CO2** | **Demonstrate** about various forces and their effects on linear and circular motion, the principles of conservation of linear momentum and conservation of mechanical energy, **applying** them to real-world examples. | **K2 & K3** |
| **CO3** | **Demonstrate** the concepts related to work, friction, power, and energy, along with their practical **applications** in various engineering scenarios. | **K2 & K3** |
| **CO4** | **Demonstrate** and **Apply** the concepts of translatory and rotational motions, torque, angular momentum, and moment of inertia. | **K2 & K3** |
| **CO5** | **Demonstrate and apply** the concepts of elasticity, stress, strain, and different types of moduli of elasticity, stress-strain curves. | **K2 & K3** |

# CONCEPT OF PROGRAMMING USING C

**(DE-CSE-23103)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

This course offers a fundamental understanding of programming in C language in order to assists students to use computers productively in problem solving. Students will be familiar with the concepts of data types, understand different input/output formatting techniques, and recognise the use of arrays, strings, and functions etc. in C programmes. By learning these concepts, students will be able to build problem-solving skills to design logical and efficient solutions to complex computational problems.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify and Explain the basic concepts of algorithms, flowcharts, and the basic structure of C programming language.
2. Comprehend the fundamental principles of various control structures and loops in programming. With this understanding, they can skilfully apply these concepts to tackle a wide range of arithmetic and logical problems effectively.
3. Gain a clear understanding of the fundamental concepts of user defined functions in the C programming language. They will learn how to create functions and implement them. This understanding empowers them to write more organized and maintainable C programs.
4. Develop programs by comprehending and effectively utilizing the concepts of array, structures, and unions. By learning these concepts, students can design efficient programs that handle diverse data types.
5. Demonstrate the fundamental concept of pointers in programming. They will learn how to work with memory addresses and manipulate data through pointers effectively. Additionally, students will apply file handling techniques to demonstrate file systems, learning how to read from and write to files in a program.

## DETAILED CONTENTS

**UNIT 1: Introduction to Programming** **12 Periods**

1.1 Algorithm: Representation of Algorithm, Flowchart, Pseudo code, From algorithm to program, Concept of assembler, compiler, interpreter, loader and linker.

1.2 Program Structure: Structure of C program, Writing and executing the first C program, I/O statement, assign statement, Keywords, constants, variables and data types, storage classes, operators and expressions, Unformatted and Formatted IOS, Data Type Casting.

**UNIT 2: Conditional Branching and Looping** **07 Periods**

2.1 Conditional Branching: Introduction, decision making with if-statement, nested-if, if-else and ladder, break, continue, goto and switch statements.

2.2 Loop: while, do-while, for, nested for loop.

**UNIT 3: Functions** **07 Periods**

3.1 Introduction to functions, Global and Local Variables, Function Declaration, Function Call and Return, Types of Functions, Standard functions, Parameters and Parameter Passing, Call - by value/reference, recursive function, function with

array, function with string.

**UNIT 4: Array and Strings** **08 Periods**

4.1 Array: Introduction to Arrays, Array Declaration, Length of array, Manipulating Array elements, Single and Multidimensional Array, Arrays of characters, Passing an array to function, Structures, Unions, Array of structure variable

4.2 String: Introduction of Strings, String declaration and definition, String Related function i.e. strlen, strcpy, strcmp.

**UNIT 5: Pointers and File Handling** **08 Periods**

5.1 Pointers: Introduction to pointers, Static and dynamic memory allocation, Address operator and pointers, Declaring and initializing pointers, Single pointer, Pointers to an array, Pointers to a structure

5.2 File Handling: Basics of File Handling, opening and closing of File, reading and writing character from a file.

## RECOMMENDED BOOKS


1. **Let Us C** By Yashwant P. Kanetkar.
2. **Programming in ANSI C** by E Balaguruswami, , Tata McGraw Hill Education Pvt Ltd, New Delhi.
3. **Programming in C** by Reema Thareja; Oxford University Press, New Delhi.
4. **Programmming in C** : A Practical Approach by Ajay Mittal, Pearson Publication.


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | **Course Outcomes** | **Bloom's Knowledge level** |
|---|---|---|
| **CO1** | **Demonstrate** the basic concept of algorithms, flowchart, and C programming language and **applying** them to solve pre-defined problems. | **K2 & K3** |
| **CO2** | **Demonstrate** the basic concept of various control structures and loops and then **applying** them to solve various arithmetic and logical problems. | **K1 & K3** |
| **CO3** | **Demonstrate** the basic concepts of functions and **creating** functions in C programme. | **K2 & K3** |
| **CO4** | **Developing** programs by understanding and using the concept of array, structures and unions. | **K2 & K3** |
| **CO5** | **Demonstrate** the basic concept of pointers and **apply** file handling to demonstrate file system. | **K2 & K3** |

## SCHOOL OF ENGINEERING & TECHNOLOGY

### FUNDAMENTALS OF COMPUTER & INFORMATION TECHNOLOGY

**(DE-CSE-23104)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have knowledge of computer hardware and information technology. They should possess they knowledge of various number systems, DOS, Operating systems & internet.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate the basic components of a computer system, including the CPU, memory, storage, and input/output devices. They should be able to explain the flow of data and instructions within a computer.
2. Demonstrate about various number systems used and their inter-conversion.
3. Identify and explain different operating systems, their functions, and how they manage hardware and software resources. They should be able to perform basic tasks in various operating systems.
4. Demonstrate how data is transmitted and received over networks and various network topologies.
5. Learn about the internet, web browsers.

## DETAILED CONTENTS

**UNIT 1: Fundamentals of Computer** **12 Periods**

1.1 Historical evolution of computers, Generations of computers, Classification of computers - based on size, processor, Usefulness of Computers, Applications of computers, Block Diagram along its components and characteristics, Interaction between the CPU, Memory Input/output devices, function of CPU and major functional parts of CPU.

1.2 State the relevance of speed and word length for CPU Performance, Recognize the current family of CPUs used in Computers, Types of Memory- RAM ROM, Monitor, Mouse, Keyboard, Disk, joysticks, Storage Devices, floppy disk, CD, DVD, Pen drive, trackballs, Printers Types of printers, Scanner, Modem, Video, Sound cards, Speakers.

**UNIT 2: Data Representation** **8 Periods**

2.1 Definition Of Information, difference between data and information ,importance of Binary Number System, various number systems, Conversion from Decimal to Binary, Conversion from Binary to Decimal, binary number into hexadecimal number, hexadecimal number into binary number System, Memory Addressing and its Importance, ASCII and EBCDIC coding System.

**UNIT 3: DOS & Windows Operating Systems** **10 Periods**

3.1 Hardware and Software, Types of software, Introduction and need of operating system, Types of operating system, dos operating system, Types of dos Commands, operating system as a resource manager; BIOS; System utilities - Editor, Loader, Linker, File Manager. Concept of GUI and CUI standards. Directories and files, wild cards, autoexec.bat, config.sys

3.2 Features of Window desktop, Components of Window, function of each component of Window, method of starting a program using start button, Understand maximize, minimize, restore down and close button, uses of file and

folder, method of viewing the contents of hard disk drive using explore option, control panel, disk defragmentation installation and un installation of the application software.

**UNIT 4: Introduction to Computer Networks** **6 Periods**

4.1 Concepts of computer Network, Client Server Model, Peer to Peer Model, Networking Devices: Switch, Router, Hub, Bridge, Gateway, LAN, MAN, WAN, Topology, Internet, Intranet, Extranet, internet service provider and its relevance, role of the modem in accessing the internet.

**UNIT 5: Internet and World Wide Web** **6 Periods**

5.1 Purpose of web browser software, URL, URI, URN, WWW, FTP, HTTP, HTTPS, TCP/IP, RDC(Remote Desktop Connection), Email, creating email account, process of sending and receiving e-mail, transmission modes, IP address and its format, MAC Address, DNS, search engines, social network sites, internet security, Firewall, Cloud Computing and its services.

## RECOMMENDED BOOKS


1. **Fundamentals of Computer** by E Balagurusamy,Tata McGraw Hill EducationPvt. Ltd, New Delhi
2. **Computer Fundamentals** by RS Salaria; Khanna Book Publishing Co. (P) Ltd., New Delhi.
3. **Introduction to Information Technology** by V. Rajaraman
4. **Computers Today** by SK Basandara, Galgotia publication Pvtltd. Daryaganj, New Delhi.
5. **Computer Networks** by Andrew S. Tanenbaum and David J. Wetherall


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Identify and explain** the knowledge of the basic structure, components, features and generations of computers. | **K1 & K2** |
| **CO2** | **Demonstrate** about various number systems used and their inter-conversion. | **K1 & K2** |
| **CO3** | **Learn** about different operating systems and also perform basic tasks in various operating systems. | **K1& K3** |
| **CO4** | **Demonstrate** the basics of computer networks and various network topologies. | **K1 & K2** |
| **CO5** | **Demonstrate** functioning & services of the Internet and basics of multimedia | **K1 & K2** |

## SCHOOL OF ENGINEERING & TECHNOLOGY

### BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

**(DE-EE-23105)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

The primary objective of this course is to equip diploma holders with essential knowledge and skills related to basic electrical engineering, which they will encounter in their professional careers. Knowledge about fundamental electrical engineering concepts is required for several reasons like Hardware Understanding & Troubleshooting, Circuit Design, Signal Processing, Electromagnetic Interference, Robotics and Automation etc.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate the measurement of electrical quantities like voltage, current, power, electrical energy etc.
2. Demonstrate the basics of AC circuits.
3. Explain the concepts of Electrical Machines.
4. Explain the concepts of semiconducting material and semiconducting devices.
5. Explain the working and applications of Electronic circuits.

## DETAILED CONTENTS

**UNIT 1: Basics of Electrical Energy & Dc Circuits** **12 Periods**

1.1 Applications of electricity, Advantages of electrical energy over other types of energy

1.2 Definition of voltage, current, power and electrical energy with their units, name of instruments used for measuring above quantities, connection of these instruments in an electric circuit.

1.3 Ohms law, resistivity, effect of temperature on resistance, heating effect of Electric current, Series and Parallel Connection, Kirchoff's laws, application of Kirchoff's laws to solve, simple DC circuits simple numerical problems.

**UNIT 2: AC Fundamentals** **10 Periods**

2.1 Electromagnetic induction-Faraday's Laws, Lenz's Law; Fleming's rules,

2.2 Principles of 1-ϕ AC Circuits; Alternating emf, Definition of cycle, frequency, amplitude and time period. Instantaneous, Peak, average and rms value of sinusoidal voltage & current;

Concept of phase and phase difference. Concept of resistance, inductance and capacitance in simple a.c. circuit, Impedance Triangle, Various Types of power in AC circuits, Power Triangle, Power factor and improvement of power factor by use of capacitors.

2.3 Concept of three phase system; star and delta connections; voltage and current relationship (no derivation)

**UNIT 3: Electrical Machines** **8 Periods**

3.1 Working, principle and construction of single phase transformer, Turn Ratio

3.2 DC motor, its working Principle, Classification, Speed control methods.

3.3 AC motor, Alternator

**UNIT 4: Semiconductors** **8 Periods**

4.1 Band Theory of Semiconductors, Doping, P and N type semiconductor; PN Junction Diode and its characteristics, Junction Breakdown, Zener diode.

4.2 Introduction to BJT : NPN and PNP transistors, symbols and explanation of fundamental current relations. Characteristic,

**UNIT 5: Application of Electronics** **8 Periods**

5.1 Rectifier circuits, Comparision of Various rectifier circuits, Voltage Multiplier, Zener Diode as Voltage Regulator, transistor as switch, transistor as amplifier configuration.

## RECOMMENDED BOOKS


1. **Fundamentals of Electrical Engineering & Electronics** by S K Sehdev, KATSON Pub.
2. **Basic Electronics** by VK Mehta; S Chand and Co., New Delhi
3. **Electrical Machines** by SK Bhattacharya; Tata McGraw Hill, New Delhi
4. **Basic electronics and Linear circuits** by NN Bhargava and Kulshreshta, Tata McGraw Hill.
5. **Electronic principles** by SK Sachdev, Dhanpat Rai and Sons


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Demonstrate and measure electrical quantities like voltage, current, power, electrical energy etc in DC circuits.** | **K1 & K2** |
| **CO2** | **Demonstrate** the basics of AC circuits. | **K1 & K2** |
| **CO3** | **Explain** the concepts and classification of Electrical Machines. | **K1 & K2** |
| **CO4** | **Explain** the concepts of semiconducting material and semiconducting devices. | **K1 & K2** |
| **CO5** | **Identify and Expalin** the working and applications of Electronic circuits. | **K2 & K3** |

# Communication Skill in Hindi & English - I

**(DE-ASH-23104)**

| L | T | P |
|---|---|---|
| 2 | 0 | 0 |

## JUSTIFICATION

Proficiency in the Hindi & English language plays a pivotal role in advancing one's career. This subject focuses on instilling fundamental principles of effective communication while prioritizing the cultivation of essential skills such as active listening, articulate speaking, proficient reading, and proficient writing as integral components of Communication Skills development.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify the building blocks of sentences (like nouns and verbs), and write sentences that make sense using the right words.
2. Understand the importance of communication well in life, both personally and professionally.
3. Identify how people share ideas, feelings, and information, and you'll be able to explain it to others.
4. Become proficient in reading and comprehending unseen passages. They will also have the ability to perform tasks such as one-word substitution, identifying prefixes and suffixes, and recognizing antonyms and synonyms based on the passages.
5. Read and understand new texts, and write different types of things like stories, announcements, and essays, using the right rules and style.

## DETAILED CONTENTS

**UNIT 1: Basics of Communication** **8 Periods**

- 1.1 Definition and process of communication
- 1.2 Types of communication - formal and informal, oral and written, verbal and non-verbal
- 1.3 Communications barriers and how to overcome them
- 1.4 Barriers to Communication, Tools of Communication

**UNIT 2: Application of Grammar** **8 Periods**

- 2.1 Parts of Speech (Noun, verb, adjective, adverb) and modals
- 2.2 Sentences and its types
- 2.3 Tenses
- 2.4 Active and Passive Voice
- 2.5 Punctuation
- 2.6 Direct and Indirect Speech

**UNIT 3: English Reading Practices** **10 Periods**

- 3.1 Reading unseen passage
- 3.2 Analyse language elements such as one-word substitutions, prefixes, suffixes, antonyms, synonyms, and more.

**UNIT 4: English Reading & Writing Practices** **10 Periods**

- 4.1 Writing practice: Summarizing short passages.
- 4.2 Introduction to formal letter writing.
- 4.3 Introduction to Notice writing.

**UNIT 5: Hindi Reading & Writing Practices** **16 Periods**

5.1 Writing practice: Summarizing short passages.

5.2 Introduction to formal letter writing.

5.3 Introduction to common Hindi idioms (Muhavare) and proverbs (Lokpriya Kahavatein)

5.4 Writing practice: Short essays on Hindi culture and literature.

5.5 Learning about famous Hindi writers, poets, Indian present and past personalities, and their works.

## RECOMMENDED BOOKS


1. **Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.**
2. **Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.**
3. **High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.**
4. **Communication Skills** – I by R Thakur, Nageen Prakashan Publication, Meerut, UP, India
5. **Excellent General English**-R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
6. **The Functional aspects of Communication Skills** – Dr. P. Prsad, S.K. Katria & Sons, New Delhi


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Identify and explain** the basics of communication, communication barriers and will possess strategies to overcome them. | **K1 & K2** |
| **CO2** | **Identify** the building blocks of sentences (like nouns and verbs), and **apply** them in write sentences that make sense using the right words. | **K1 & K3** |
| **CO3** | **Demonstrate** the English reading skills and will also gain the **ability** to perform tasks such as one-word substitution, identifying prefixes and suffixes, and recognizing antonyms and synonyms based on the passages. | **K2 & K3** |
| **CO4** | **Demonstrate** the English writing skills by writing different types of things like stories, announcements, and essays, using the right rules and style**.** | **K2 & K3** |
| **CO5** | **Demonstrate** the Hindi writing skills by writing different types of things like letters, announcements, and essays, using the right rules and style. | **K2 & K3** |

# SCHOOL OF ENGINEERING & TECHNOLOGY

## APPLIED PHYSICS LAB

**(DE-ASH-23112)**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have hands-on knowledge of basic electrical measurements and electronic circuits, which they will encounter in their professional careers.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate the use of high precision measuring callipers.
2. Demonstrate the laws of vector addition and subtraction.
3. Demonstrate the methods for the measurement of moment of inertia, acceleration due to gravity etc.
4. Demonstrate the concepts of Stoke's Law and Hooke's Law.
5. Demonstrate the conservation of energy.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | To find radius of wire and its volume and the maximum permissible error in these quantities by using both screw gauge. |
| 2 | To find diameter of metallic bob and use it to calculate its volume. Also Find the maximum permissible error in these quantities by using Vernier callipers. |
| 3 | To verify parallelogram law of vector addition and Subtraction. |
| 4 | To find the Moment of Inertia of a flywheel about its axis of rotation. |
| 5 | To find the value of acceleration due to gravity on the surface of earth by using a simple pendulum. |
| 6 | To study conservation of energy of a ball or cylinder rolling down an inclined plane. |
| 7 | To determine the viscosity of glycerin by Stoke's method |
| 8 | To determine force constant of spring using Hooks law |
| 9 | Simulation Practical-1 |
| 10 | Simulation Practical-2 |

## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Demonstrate** the use of high precision measuring callipers | **K2 & K3** |
| **CO2** | **Demonstrate** the laws of vector addition and subtraction.. | **K2 & K3** |
| **CO3** | **Demonstrate** the methods for the measurement of moment of inertia, acceleration due to gravity etc. | **K2 & K3** |
| **CO4** | **Demonstrate** the concepts of Stoke's Law and Hooke's Law. | **K2 & K3** |
| **CO5** | **Demonstrate** the conservation of energy. | **K2 & K3** |

# SCHOOL OF ENGINEERING & TECHNOLOGY

## CONCEPTS OF PROGRAMMING USING 'C' LAB

**(DE-CSE-23113)**

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering should start with the basic programs to build a strong foundation, and gradually move on to the intermediate ones to deepen your understanding of C programming. He should remember to write, compile, and test code thoroughly to gain practical experience. Course has exercises that cover a range of fundamental programming concepts from beginner to intermediate level.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate his strong foundational knowledge in C programming concepts, including variables, data types, operators, conditionals, loops, and basic I/O operations.
2. Apply Problem-Solving Skills to provide logical solutions to various real-world scenarios. They will learn to analyse problems, break them down into smaller steps, and implement solutions using C programming.
3. Apply Algorithmic Thinking to devise step-by-step procedures to solve problems efficiently and logically.
4. Demonstrate practical experience in coding, debugging, and testing By implementing programs that calculate, manipulate, and display data.
5. Apply skills to tackle more complex programming challenges and projects in C.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Write a program to print, "hello world program" in the output screen. |
| 2 | Write a program to print your name in the output screen. |
| 3 | Write a program for Addition, subtraction, multiplication and division of two pre-defined numbers. |
| 4 | Write a program to get the two numbers input from user and provide the Addition, subtraction, multiplication and division as results. |
| 5 | Write a program to find the area of a circle. |
| 6 | Write a program to get the input from user and Calculate simple interest based on the input. |
| 7 | Write a program to Convert celsius to fahrenheit |
| 8 | Write a program to Check even or odd. |
| 9 | Write a program to Generate Multiplication Table. |
| 10 | Write a program to Find the Largest Number in an Array. |
| 11 | Write a program to Find the Sum of N Natural Numbers. |
| 12 | Write a program to Check Prime Number. |
| 13 | Write a program to Reverse a Number. |
| 14 | Write a program to Calculate the Power of a Number. |

15 Write a program to Find GCD (Greatest Common Divisor) of Two Numbers

16 Write a program to Calculate LCM (Least Common Multiple)

17 Write a program to Count the Number of Digits in an Integer

18 Write a program to Generate a Random Number.

19 Calculate Factorial of a Number

20 Write a program for entering two matrices and finding out their addition.

21 Write a program to Compute the Factorial of a Large Number Using Arrays.

22 Write a program to Reverse a String

23 Write a program to enter string name using pointers.

24 Write a program to Find the Nth Prime Number.

25 Write a program to Implement a Simple Calculator with Functions

26 Write a program to Create a To-Do List Program (using arrays)

27 Write a program to Check for a Vowel or Consonant in a string.

28 Write a program to Calculate the Length of a String

29 Write a program to Convert Decimal to Binary

30 Write a program to Implement a Rock, Paper, Scissors Game (with user input)

## RECOMMENDED BOOKS


1. **Fundamentals of Computer** by E Balagurusamy,Tata McGraw Hill EducationPvt. Ltd, New Delhi
2. **Computer Fundamentals** by RS Salaria; Khanna Book Publishing Co. (P) Ltd., New Delhi
3. **Computers Today** by SK Basandara, Galgotia publication Pvtltd. Daryaganj, New Delhi.
4. **Introduction to Information Technology** by V. Rajaraman
5. **Computer Networks** by Andrew S. Tanenbaum and David J. Wetherall


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | **Course Outcomes** | **Bloom's Knowledge level** |
|---|---|---|
| **CO1** | **Demonstrate** his strong foundational knowledge in c programming concepts, including variables, data types, operators, conditionals, loops, and basic i/o operations. | **K2 & K3** |
| **CO2** | **Apply** problem-solving skills to provide logical solutions to various real-world scenarios. They will learn to analyse problems, break them down into smaller steps, and implement solutions using c programming. | **K2 & K3** |
| **CO3** | **Apply** algorithmic thinking to devise step-by-step procedures to solve problems efficiently and logically. | **K2 & K3** |
| **CO4** | **Demonstrate** practical experience in coding, debugging, and testing by implementing programs that calculate, manipulate, and display data. | **K3 & K4** |
| **CO5** | **Apply** skills to tackle more complex programming challenges and projects in c. | **K3 & K4** |

## SCHOOL OF ENGINEERING & TECHNOLOGY

### FUNDAMENTALS OF COMPUTER & INFORMATION TECHNOLOGY LAB

**(DE-CSE-23114)**

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have knowledge of computer hardware and information technology. They should possess they knowledge of various number systems, DOS, Operating systems & internet.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate the basic components of a computer system, including the CPU, memory, storage, and input/output devices..
2. Demonstrate the proficiency with the use of Microsoft Windows Operating Systems.
3. Identify and explain different operating systems, their functions, and how they manage hardware and software resources. They should be able to perform basic tasks in various operating systems.
4. Demonstrate how data is transmitted and received over networks and various network topologies.
5. Learn about the internet, web browsers.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Familiarization with Computer Hardware and its peripheral devices. Practice of assembling computer hardware to build a PC. |
| 2 | Prepare a list of all the hardware components with the detailed specification and company make. |
| 3 | Study of various Operating Systems. Practice on latest windows operating system: creating file, folder, Copying, moving, deleting file, folder, control panel, User Account creation, changing display settings, time, and language and region settings. |
| 4 | Installing and uninstalling of new software & hardware using control panel. |
| 5 | Study different port available on motherboard for connecting various input and output peripherals. Also Practice to connect the projector and monitor simultaneously using VGA splitters. |
| 6 | Changing resolution, colour, appearances, and screensaver option of the display. Changing System Date and Time. |
| 7 | Disk defragmentation using system tool. Procedure of disk partition and its operation (Shrinking, Extending, Delete, Format). |
| 8 | Internet browsing using different browsers. Using of different Search Engines to get information from internet. Also List down the top five browsers with their Statistical Data. |
| 9 | Email account creation, reading, writing and sending emails with attachments. |
| 10 | Practice of internal and external commands of DOS. |
| 11 | Installation of Operating Systems. |

12 Installation of any software like Microsoft office, AutoCAD, Firefox Browsers etc.

13 Prepare a price comparison list of computer hardware available from different manufacturing.

14 Troubleshooting exercises on hardware and operating system.

## RECOMMENDED BOOKS


1. **Fundamentals of Computer** by E Balagurusamy,Tata McGraw Hill EducationPvt. Ltd, New Delhi
2. **Computer Fundamentals** by RS Salaria; Khanna Book Publishing Co. (P) Ltd., New Delhi
3. **Computers Today** by SK Basandara, Galgotia publication Pvtltd. Daryaganj, New Delhi.
4. **Introduction to Information Technology** by V. Rajaraman


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | **Course Outcomes** | **Bloom's Knowledge level** |
|---|---|---|
| **CO1** | **Identify and explain** the knowledge of the basic structure, components, features and generations of computers. | **K1 & K2** |
| **CO2** | **Demonstrate** about various number systems used and their inter-conversion. | **K1 & K2** |
| **CO3** | **Learn** about different operating systems and also perform basic tasks in various operating systems. | **K2 & K3** |
| **CO4** | **Demonstrate** the basics of computer networks and various network topologies. | **K2 & K3** |
| **CO5** | **Demonstrate** functioning & services of the Internet and basics of multimedia | **K2 & K3** |

## BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB

**(DE-EE-23115)**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have hands-on knowledge of basic electrical measurements and electronic circuits, which they will encounter in their professional careers.

## LEARNING OUTCOMES

After completing this course, students will be able to:

6. Measure electrical quantities like voltage, current, power, electrical energy etc.
7. Demonstrate the basics of AC circuits and power factor correction method.
8. Demonstrate the methods of speed control of Electrical Machines.
9. Demonstrate the concepts of semiconducting material and semiconducting devices.
10. Demonstrate the working and applications of Electronic circuits.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Identification of Resistor, Capacitor, Inductor, Transformer, Diode, BJT etc |
| 2 | Familiarization with the use of ammeter/ Voltmeter/multimeters etc.. |
| 3 | Connection of Series, Parallel and Complex Connection and measuring and verifying the resistance, current and voltage drop across all the elements and power delivered and consumed into the circuit. |
| 4 | Connection and reading of an electric energy meter. |
| 5 | Verification of Power Factor improvement using capacitor. |
| 6 | Verification of Various Armature control methods for Speed control of DC motor |
| 7 | To draw V-I characteristics of PN junction diode |
| 8 | Measurement of wave shapes of half wave rectifier and full wave rectifier. |
| 9 | Study of zener as a constant voltage source and to draw its V-I characteristics |
| 10 | Demonstrate the use of BJT as a Switch. |

## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Measure** electrical quantities like voltage, current, power, electrical energy etc. | **K2 & K3** |
| **CO2** | **Demonstrate** the basics of AC circuits and power factor correction method. | **K2 & K3** |
| **CO3** | **Demonstrate** the methods of speed control of Electrical Machines. | **K2 & K3** |
| **CO4** | **Identify and Explain** the concepts of semiconducting devices. | **K1 & K2** |
| **CO5** | **Identify and Explain** the working and applications of Electronic circuits. | **K2 & K3** |

## SCHOOL OF ENGINEERING & TECHNOLOGY

### COMMUNICATION SKILL-I LAB

**(DE-ASH-23114)**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

Proficiency in the Hindi & English language plays a pivotal role in advancing one's career. This subject focuses on instilling fundamental principles of effective communication while prioritizing the cultivation of essential skills such as active listening, articulate speaking, proficient reading, and proficient writing as integral components of Communication Skills development.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify the building blocks of sentences (like nouns and verbs), and write sentences that make sense using the right words.
2. Understand the importance of communication well in life, both personally and professionally.
3. Identify how people share ideas, feelings, and information, and you'll be able to explain it to others.
4. Become proficient in reading and comprehending unseen passages. They will also have the ability to perform tasks such as one-word substitution, identifying prefixes and suffixes, and recognizing antonyms and synonyms based on the passages.
5. Read and understand new texts, and write different types of things like stories, announcements, and essays, using the right rules and style.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Self and peer introduction |
| 2 | Newspaper reading |
| 3 | Just a minute session-Extempore |
| 4 | Greeting and starting a conversation |
| 5 | Leave taking |
| 6 | Thanking |
| 7 | Wishing well |
| 8 | Talking about likes and dislikes |
| 9 | Group Discussion |
| 10 | Listening Exercises. |

## RECOMMENDED BOOKS


1. **Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.**
2. **Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.**
3. **High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.**

4. **Communication Skills** – I by R Thakur, Nageen Prakashan Publication, Meerut, UP, India
5. **Excellent General English**-R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
6. **The Functional aspects of Communication Skills** – Dr. P. Prsad, S.K. Katria & Sons, New Delhi

## COURSE OUTCOMES

| At the end of this course students will demonstrate the ability to: | | |
|---|---|---|
| | **Course Outcomes** | **Bloom's Knowledge level** |
| **CO1** | **Identify and explain** the basics of communication, communication barriers and will possess strategies to overcome them. | **K1 & K2** |
| **CO2** | **Identify** the building blocks of sentences (like nouns and verbs), and **apply** them in write sentences that make sense using the right words. | **K1 & K3** |
| **CO3** | **Demonstrate** the English reading skills and will also gain the **ability** to perform tasks such as one-word substitution, identifying prefixes and suffixes, and recognizing antonyms and synonyms based on the passages. | **K2 & K3** |
| **CO4** | **Demonstrate** the English writing skills by writing different types of things like stories, announcements, and essays, using the right rules and style**.** | **K2 & K3** |
| **CO5** | **Demonstrate** the Hindi writing skills by writing different types of things like letters, announcements, and essays, using the right rules and style. | **K2 & K3** |

# Semester 2nd

## SCHOOL OF ENGINEERING & TECHNOLOGY

## APPLIED MATHEMATICS - II

**(DE-ASH-23201)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1:** Integral Calculus-I — 12 Periods

Method of Indefinite Integration: Integration by substitution, Integration by rational function, Integration by partial fraction, Integration by Parts, Integration of special function

**UNIT 2:** Integral Calculus -II — 10 Periods

Meaning and properties of definite integrals, Evaluation of definite integrals, Application : Length of simple curves, Finding areas bounded by simple curves Volume of solids of revolution, centre of mean of plane areas.

**UNIT 3:** Numerical Iteration Methods — 10 Periods

Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases. Numerical solutions of algebraic equations; Bisections method, Regula-Falsi method, Newton-Raphson's method(without proof), Numerical solutions of simultaneous equations; Gauss elimination method(without proof)

**UNIT 4:** Co-ordinate Geometry (2 Dimension) — 12 Periods

Circle , Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.

**UNIT 5:** Co-ordinate Geometry (3 Dimension) — 12 Periods

Straight lines and planes in space

Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line (without proof)

## RECOMMENDED BOOKS


5. **Applied Mathematics-II** by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut
6. **Elementary Engineering Mathematics** by BS Grewal, Khanna Publishers, New Delhi
7. **Engineering Mathematics, Vol I & II** by SS Sastry, Prentice Hall of India Pvt. Ltd.,
8. **Applied Mathematics-II** by Chauhan and Chauhan, Krishna Publications, Meerut.

## OBJECT-ORIENTED PROGRAMMING USING C++

**(DE-CSE-23202)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

This course provides an essential understanding of C++ and basic OOP concepts necessary in today's tech industry. Covering a wide range of topics from foundational concepts to advanced features like classes, inheritance, pointers, and file handling, this course focuses on practical applications, preparing students for roles in software development with a solid foundation in object- oriented programming principles and C++.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Acquire a deep understanding of Object-Oriented Programming (OOP) principles and C++ basics. They will proficiently compare programming paradigms, understand core OOP principles, and demonstrate practical skills in writing C++ programs. Additionally, they will showcase competency in language elements, facilitating effective manipulation of data structures within C++ programs.
2. Attain a comprehensive understanding of classes, objects, constructors, and destructors in object-oriented programming. They will demonstrate the ability to implement classes effectively, utilizing constructors and destructors appropriately, to model real-world scenarios within a programming context.
3. Define derived classes, comprehend various inheritance types (single, multiple, multilevel, hybrid), and understand the roles of virtual base classes and abstract classes within inheritance hierarchies.
4. Demonstrate a comprehensive understanding of pointers, virtual functions, and polymorphism in C++, enabling them to effectively apply these concepts to solve programming challenges effectively and design adaptable programs.
5. Describe basics of C++ file handling, including stream class utilization; various file operations (opening, closing, reading, and writing), selection of appropriate file modes, and practical implementation of file handling techniques in programming contexts.

## DETAILED CONTENTS

**UNIT 1: Introduction to Object-Oriented Programming & C++** **14 Periods**

1.3 Introduction to OOP: Procedure-oriented Programming versus Object Oriented Programming (OOP), Basic Concepts of Object Oriented Programming, Advantages of Object Oriented Programming, Object Oriented Languages, and Applications of Object Oriented Programming.

1.4 Introduction to C++: C versus C++, C++ Concepts, Structure of C++ program, Simple C++ Program, Applications of C++.

1.5 Constants & Variable: Tokens, Keywords, Constants, Defining Constants, Variables, Declaration of variables and Dynamic initialization of variables, Reference variables

1.6 Data Types & Operators in C++: Basic Data types in C++, User-defined Data types, Derived Data types, Type Casting, Operators, Scope Resolution Operators, and Memory Management Operators, and Expressions.

1.7 Control Structures: Decision-making statements and loops.

1.8 Array & Structures: Arrays, Strings, and Structures in C++.

**UNIT 2: Classes and Objects** **10 Periods**

2.1 Class & Object: Introduction, Specifying a class, Access specifiers, Defining

member functions, Creating objects, Memory allocation for objects, Static data members, Static member function, Friend function, Array of objects, Objects as function arguments.

2.2 Constructor & Destructor: Concept of constructors, Types of constructors, Multiple constructors in a class, Constructors with default arguments, Destructors.

**UNIT 3: Inheritance** **08 Periods**

3.1 Introduction: Concept of Inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hybrid Inheritance, Virtual Base Class, Abstract Classes, Constructor in Derived Classes.

**UNIT 4: Pointers, Virtual Functions, and Polymorphism in C++** **12 Periods**

4.1 Pointers: Concept of Pointers, Pointer declaration, Pointer operator, Address operator, Pointer arithmetic, Pointer to Object, 'this' Pointer, Pointer to Derived Classes.

4.2 Virtual Functions: Virtual Function, Rules for Virtual Functions Pointers to Virtual Functions.

4.3 Polymorphism: Introduction to Polymorphism, Types of Polymorphism, Function overloading, Operator Overloading, Overloading of unary and binary operators, Rules for overloading, Run time polymorphism.

**UNIT 5: File Handling** **06 Periods**

5.1 File Handling: C++ stream classes, Classes for file stream operations, opening files, closing files, reading from files and writing to files, detection of end of file, file modes.

## RECOMMENDED BOOKS


1. **Object Oriented Programming with C++** by E. Balagurusamy, Tata McGraw Hill Education.
2. **C++ and Object Oriented Programming Paradigm**, PHI
3. **Mastering Object Oriented Programming with C++,** R. S. Salaria, Khanna Publishing House
4. **The Compete Reference C++**, Herbert Schlitz, TMH


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Summarize** Object-Oriented Programming (OOP) principles and C++ fundamentals. | **K2** |
| **CO2** | **Illustrate** a thorough understanding of object-oriented programming principles related to classes, objects, constructors, destructors, and static members and **apply** them in problem-solving. | **K2 & K3** |
| **CO3** | **Implement** inheritance hierarchies, manage constructors in derived classes, and utilize advanced features like virtual base classes and abstract classes for creating efficient and flexible programs using C++. | **K3** |
| **CO4** | **Describe** the concept of pointers, virtual functions, and polymorphism and **apply** these concepts for creating versatile and efficient programs in C++. | **K2 & K3** |
| **CO5** | **Explain** file handling mechanism in C++ and **create** efficient and reliable programs involving file handling. | **K2 & K3** |

# INTRODUCTION OF WEB DESIGNING

**(DE-CSE-23203)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## JUSTIFICATION

The diploma holders in Computer Science and Engineering needs to understand about Internet, Web Space and how to develop static website. They should be able to develop basic static websites by using different front-end Technologies.

## LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

1. Understand working of Internet/ Websites, Client Server Model and Internet Tools.
2. Understand and develop HTML Web pages.
3. Provide logics on the web pages by using JavaScript
4. Control the Look and feel of web pages by using CSS
5. Styling the webpages using CSS selectors.

## DETAILED CONTENTS

| | | |
|---|---|---|
| **UNIT 1:** | **Web Development: Introduction** | **10 Periods** |
| 1.1 | Internet, WWW, Browser, Search engine Client Server Model, URL, Web Pages, Website and Web Services, Types of Websites (Static, Dynamic and Responsive), Basic principles involved in developing a web site, Domains and Hosting | |
| 1.2 | Downloading free Editors like Notepad++, Sublime Text Editor, Making use of Editors, File creation and editing, saving. | |
| **UNIT 2:** | **HTML: Introduction** | **10 Periods** |
| 2.1 | HTML Document, Characteristics of HTML, Applications of HTML, Basic Structure of HTML, Syntax, HTML Tags and Attributes, Types of HTML Tags, Rules of nesting, Basic Tags (HTML Tag. Head Tag, Title Tag, Body Tags). | |
| 2.2 | **Page Formatting**: Adding a new Paragraph, Adding a line break, Inserting a blank space , changing page background | |
| **UNIT 3:** | **HTML Elements** | **6 Periods** |
| | Html Headings, Formatting elements (Bold Text, Italic Text, Small text, Deleted text, Inserted text), Creating lists(Ordered and unordered), Deleted text, Inserted text, Subscript text, Superscript text), Comments, Horizontal Lines, List (Ordered, Unordered, Nested). | |
| **UNIT 4:** | **Cascading Style Sheets(CSS)** | **12 Periods** |
| | Introduction, Benefits of CSS, CSS Syntax, CSS Implementation (inline, internal and external), CSS Selectors (ID Selectors, Class Selectors, Grouping Selectors, Universal Selectors, CSS Pseudo-classes), CSS properties (background-colour, background-image, border-style, height, width, colour, text-align, font-family, font-style, font-size, font weight), Box Model in CSS(margin, border, padding) | |
| **UNIT 5:** | **Java Scripts** | **10 Periods** |

| | | |
|---|---|---|
| | Java Script Introduction, variables, data types, operators, control flow statements, Declaring Functions, Calling functions with parameters, Adding JavaScript to Web Documents, JavaScript Objects, and Document Object Models. | |

## RECOMMENDED BOOKS


1. **Head First HTML and CSS:** A Learner's Guide to Creating Standards-Based Web Pages , O Reilly Publications by Elisabeth Robson  Eric Freeman
2. **Web Technologies**: Black Book ,Kogent Learning Solutions Inc
3. **Developing Web Applications**: 2ed ,WileyPublications, M.T.Savaliya
4. **Head First JavaScriptProgramming:** O Reilly Publications by Eric FREEMAN

# APPLIED CHEMISTRY

**(DE-ASH-23204)**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 6: Atomic Model and Chemical Bonding** **15 Periods**

1.1 Bohr's model of atom and successes and limitations of atomic theory (qualitative treatment only).

1.2 Atomic number, atomic mass number isotopes and isobars.

1.3 Definition of orbit and orbitals, shapes of s and p orbitals only, quantum numbers and their significance, Ababa's principle, Pauli's exclusion principle and Hund's rule

1.4 Electronic configuration of elements with atomic number (Z) = 30 only. Modern periodic law and periodic table, groups and periods, classification of elements into s, p, d and f blocks (periodicity in properties - excluded),

1.5 Chemical bonding and cause of bonding.

**UNIT 7: Fuels** **10 Periods**

2.1 Definition of fuel, Calorific value-higher calorific value, lower calorific value, classification of fuels, characteristics of good fuel, relative merits of gaseous, liquid and solid fuels, Determination of calorific value fuel using Bomb calorimeter.

2.2 Coal - types of coal and proximate analysis of coal

Petroleum and its refining process, Fuel rating – Octane number and Cetane number.

Gaseous fuels like natural gas (CNG), LPG, producer gas, water gas and biogas, their calorific value and applications.

Elementary idea on – hydrogen as future fuels

**UNIT 8: Water** **15 Periods**

3.1 Demonstration of water resources on Earth using pie chart.

Classification of water – soft water and hard water, types of hardness, causes of hardness, units of hardness – mg per liter ($mgL^{-1}$) and part per million (ppm) and simple numerical.

Removal of hardness -Permutit process and Ion-exchange process.

3.2 pH and buffer solutions and their applications

3.3 Physico-Chemical methods for Water Quality Testing

a) Determination of pH using pH meter, total dissolved solids (TDS)

b) Testing and Estimation of- alkalinity, indicator their types and application

total hardness by EDTA method (chemical reaction of EDTA method are excluded).

c) Understanding of Indian Water Quality standards as per WHO.

**UNIT 9: Electrochemistry & Corrosion** **10 Periods**

4.1 Redox Reaction, Electrochemical cell (Galvanic and Electrolytic), application of electrochemistry – electroplating, galvanisation

4.2 Definition of corrosion and factors affecting corrosion rate.

4.3 Theories of a) Dry (chemical) corrosion & b) Wet corrosion in acidic atmospher

Galvanic series,

4.4 Corrosion control: Internal corrosion preventive measures

**UNIT 10: Organic compounds, Polymers and Plastics** **10 Periods**

5.1 Classification of organic compounds and IUPAC Nomenclature

5.2 Functional Groups and IUPAC Nomenclature

5.3 Definition of polymer, monomer and degree of polymerization

5.4 Classification of addition and condensation polymers with suitable examples (PE, PS, PVC, Teflon, Nylon -66 and Bakelite). Applications of polymers in industry and daily life.

5.5 Definition of plastics, thermo plastics and thermo setting plastics with suitable examples, distinctions between thermo and thermo setting plastics

## RECOMMENDED BOOKS


1. **Chemistry in Engineering** by J.C. Kuricose & J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
2. **Engineering Chemistry** by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi**.**
3. **Eagle's Applied Chemistry - I** by S. C. Ahuja & G. H. Hugar, Eagle Prakashan, Jalandhar.
4. **Engineering Chemistry – A Text Book** by H. K. Chopra & A. Parmar, Narosa Publishing House, New Delhi.
5. **Applied Chemistry - I** by Dr. P. K Vij & Shiksha Vij, Lords Publications, Jalandhar.
6. **Engineering Chemistry** by Dr. Himanshu Pandey, Goel Publishing House, Meerut, India.

# SCHOOL OF ENGINEERING & TECHNOLOGY

## OOPS USING C++ LAB

**(DE-CSE-23212)**

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering should start with the basic programs to build a strong foundation, and gradually move on to the intermediate ones to deepen your understanding of OOPS and C++ programming. He should remember to write, compile, and test code thoroughly to gain practical experience. Course has exercises that cover a range of fundamental programming concepts from beginner to intermediate level.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Demonstrate his strong foundational knowledge in C++ programming concepts from basic syntax to advanced concepts like loops, conditionals, arrays, functions, and string operations.
2. Illustrate fundamental OOPS concepts like class definition, object creation, constructors for initialization, encapsulation with public and private access, and apply these concepts for practical scenarios.
3. Comprehend the concept of inheritance, and through implementing single and multiple inheritance scenarios, students will gain insights into code reusability, hierarchy creation, and the challenges posed by multiple inheritance, enhancing their understanding of how classes can inherit properties and behaviours from other classes in C++.
4. Develop a thorough grasp of advanced C++ programming concepts such as working with pointers, virtual functions, and polymorphism and apply these features to enhance code efficiency, flexibility, and design in real-world programming scenarios.
5. Acquire practical skills in reading and displaying the contents of text files using file handling mechanisms and pointers in C++ and apply these skills to work with external data files effectively in real-world programming scenarios.

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Write a C++ program to print, “hello world program” in the output screen. |
| 2 | Write a C++ program for addition, subtraction, multiplication and division of two pre-defined numbers. |
| 3 | Write a C++ program to get the two numbers input from user and provide the Addition, subtraction, multiplication and division as results. |
| 4 | Write a program to find if a person is eligible to vote or not. |
| 5 | Write a program to find the largest number among three user-defined numbers. |
| 6 | Write a program to find factorial of a number. |
| 7 | Write a program to find sum of N natural numbers. |
| 8 | Write a function to find area of a circle. |
| 9 | Write a program to create simple calculator using functions. |
| 10 | Write a program to initialize an array and display its elements. |
| 11 | Write a program to find the largest element in an array. |

12 Write a program to search for a specific element in an array.

13 Write a program to perform basic string operations (declaration, initialization, concatenation, appending, finding length etc.)

14 Write a program to define a structure and access its members.

15 Write a program to create an array of structures and display their information.

16 Write a program to define a class and create objects to demonstrate basic usage.

17 Write a program to utilize constructors in a class to initialize object properties.

18 Write a program to define a class with private members and public member functions to access private data.

19 Write a program in C++ to prepare a student Record using classes with primitive data members

20 Write a program in C++ to display product detail using classes with array as data members.□

21 Write a program to define a class and create objects to demonstrate basic usage.

22 Write a program to implement single inheritance in C++.

23 Write a program to demonstrate multiple inheritance in C++.

24 Write a program to demonstrate basic pointer declaration, initialization, and dereferencing.

25 Write a program that illustrates pointer arithmetic operations in C++.

26 Write a program to implement a basic virtual function in a base and derived class.

27 Write a program that defines various shapes (circle, square, triangle) using polymorphism to calculate and display their respective areas.

28 Write a program to read and display the contents of a text file using basic file handling and pointers.

## RECOMMENDED BOOKS


1. **Fundamentals of Computer** by E Balagurusamy,Tata McGraw Hill EducationPvt. Ltd, New Delhi
2. **Computer Fundamentals** by RS Salaria; Khanna Book Publishing Co. (P) Ltd., New Delhi
3. **Computers Today** by SK Basandara, Galgotia publication Pvtltd. Daryaganj, New Delhi.
4. **Introduction to Information Technology** by V. Rajaraman
5. **Computer Networks** by Andrew S. Tanenbaum and David J. Wetherall


## COURSE OUTCOMES

At the end of this course students will demonstrate the ability to:

| | Course Outcomes | Bloom's Knowledge level |
|---|---|---|
| **CO1** | **Describe** core programming principles in C++ and **implement** them to diverse real-world problems. | **K2 & K3** |
| **CO2** | **Illustrate** proficiency in implementation of class definition, object creation, constructor usage, data encapsulation and proficiently handling both basic and array data structures within classes for versatile usage scenarios. | **K2 & K3** |
| **CO3** | **Demonstrate** proficiency in utilizing inheritance to create complex class structures, | **K2 & K3** |

| | | |
|---|---|---|
| | enhancing modularity and extensibility in programming projects. | |
| **CO4** | **Demonstrate** proficiency in advanced C++ concepts including pointers, pointer arithmetic, virtual functions, and polymorphism. | **K3** |
| **CO5** | **Demonstrate** practical experience in employing pointers for efficient file content manipulation. | **K3** |

# INTRODUCTION OF WEB DESIGNING LAB

**(DE-CSE-23213)**

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have hands-on knowledge of basics of web technologies included HTML, CSS and JavaScript, which they will encounter in their professional careers.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Understand working of Internet/ Websites, Client Server Model and Internet Tools.
2. Understand and develop HTML Web pages.
3. Provide logics on the web pages by using JavaScript
4. Control the Look and feel of web pages by using CSS
5. Styling the webpages using CSS selector

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Install, configure and start using developer tools /Code Editor/Browser. | |
| 2 | Create an HTML page to Provide an introduction to the Computer department/Institute using different HTML tags. | |
| 3 | Create a HTML document giving details of your [Name, Age], [Address, Phone] and [Register Number, Class] aligned in proper order using alignment attributes of Paragraph tag. | |
| 4 | Write HTML code to design a page containing some text in a paragraph by giving suitable heading style. | |
| 5 | Design a page having suitable background colour and text colour with title “My First Web Page” using all the attributes of the Font tag. | |
| 6 | Write HTML code to create a Web Page that contains an Image at its centre | |
| 7 | Write a HTML code to create a web page with pink colour background and display moving message in red colour. | |
| 8 | Create a web page, showing an ordered list of all second semester courses | |
| 9 | Create a web page, showing an unordered list of names of all the Diploma Programmes (Branches) in your institution. | |
| 10 | Create a HTML document containing a nested list showing a content page of any book. | |
| 11 | Control the look and feel of Web Page Styling by using CSS. | |
| 12 | Use Class selectors, ID selectors to style various elements of HTML Page. | |
| 13 | Write a code for html webpage which displays all practical on Border, Margin, Padding of elements. | |

| | | |
|---|---|---|
| 14 | Write a code for html webpage which displays all practical on Text/font formatting, width-Height**.** | |
| 15 | Create a student registration webpage using HTML form elements and CSS. | |
| 16 | Write JavaScript functions and control the different components of Web page by predefined JavaScript objects. | |

## SCHOOL OF ENGINEERING & TECHNOLOGY

### APPLIED CHEMISTRY LAB

**(DE-ASH-23214)**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

The use of various chemicals and chemical products in diverse technical and Engineering fields have repeatedly proved the importance of Applied Chemistry, which enhances its role to a new peak. On the other hand, ever increasing use of such materials will compel engineers, technocrats to acquire essential applied chemistry knowledge in order to select engineering materials, which not only suit them but also provide more environmental compatibility. This situation demands principles of Applied Chemistry in diploma engineering courses. Principles of Applied Chemistry will enable budding engineers and technocrats to develop scientific temper and appreciate physical, chemical and engineering properties of materials. Hence the subject of Applied Chemistry.

## LEARNING OUTCOMES

After undergoing this subject, the student will be able to:

1. Explain cause and factors which can adversely affecting natural water quality and remedial measures Available for water purification
2. Think critically, develop and adapt water conservation techniques.
3. Explain chemistry of fuels and their relative advantages.
4. Select most efficient fuel for the engine and engineering applications.
5. Suggest how to subside air pollution caused by the use of fossil fuels

## DETAILED CONTENTS

| | |
|---|---|
| 1 | Estimation of total hardness of water using standard EDTA solution |
| 2 | Estimation of total alkalinity of given water sample by titrating it against standard sulphuric acid solution |
| 3 | Proximate analysis of solid fuel |
| 4 | Estimation of temporary hardness of water sample by O' Hener's Method. |
| 5 | Determination of flash and fire point of given lubricating oil using Able's flash point apparatus |

## RECOMMENDED BOOKS


1. Chemistry in Engineering by J.C. Kuricose & J. Rajaram, Tata McGraw Hill,Publishing Company Limited, New Delhi
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai PublishingCompany, New Delhi.
3. Eagle's Applied Chemistry - I by S. C. Ahuja & G. H. Hugar, Eagle Prakashan, Jalandhar.
4. Engineering Chemistry - A Text Book by H. K. Chopra & A. Parmar, NarosaPublishing House, New Delhi.
5. Applied Chemistry - I by Dr. P. K Vij & Shiksha Vij, Lords Publications, Jalandhar.

## SCHOOL OF ENGINEERING & TECHNOLOGY

### PROFESSIONAL COMMUNICATION SKILL H & E LAB

**(DE-ASH-23215)**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

Proficiency in the Hindi & English language plays a pivotal role in advancing one's career. This subject focuses on instilling fundamental principles of effective communication while prioritizing the cultivation of essential skills such as active listening, articulate speaking, proficient reading, and proficient writing as integral components of Communication Skills development.

## DETAILED CONTENTS

1. Interpersonal Communication: Definition and its types
2. Telephonic Conversation: general etiquette for making and receiving calls
3. Conversational Skills for Interviews
4. Presentation Skills and Individual Speech Delivery
5. Argumentative Skills/Role Play Presentation with Stress and Intonation.
6. Discussion & simple conversation exercises based on the passages
7. Public speaking by using stress, pause group and pitch change technique
8. Conducting presentation in front of the group along with peer and teacher evaluation
9. Official Letters – Letters to Government and other Offices
10. Agenda & Minutes of Meeting

# SCHOOL OF ENGINEERING & TECHNOLOGY

## DIGITAL MARKETING LAB

## (DE-CSE-23216)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## JUSTIFICATION

The diploma holder in Computer Science & Engineering needs to have knowledge of Digital Marketing Techniques, including search engine optimization (SEO), social media marketing and content writing. They should possess the knowledge of Digital Marketing Technology.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify core concepts of Digital Marketing and the role of Digital Marketing in Business.
2. Understand how to use digital marketing to increase sales and grow their business.
3. Hands on experience in using Analytics Tools e.g.: Google Analytics for report extraction and campaign measurement.
4. Understand the opportunities for deploying emerging digital marketing media and techniques.
5. Implement online campaigns for your business and marketing problems within the organization by learning Ad Words Campaign Management.

## DETAILED CONTENTS

| | |
|---|---|
| **1** | Create SEO Friendly Web Pages. |
| **2** | Submit Website in various search Engines. |
| **3** | Content Writing. |
| **4** | Develop a Facebook Customized Page Tab. |
| **5** | Create and Write a blog. |
| **6** | Write an email newsletter. |
| **7** | Make a video and YouTube Channel. |
| **8** | Create Google Ad Words Account and make use of Keyword Planner. |
| **9** | Create and Use Google Analytics Account. |
| **10** | Create “refer-a-friend” or “bookmark this page” links on your site. |
| **11** | Understanding Plagiarism Checker tools |
| **12** | Understanding various SEO Tools like woo rank, seositecheckup, seoquake, similar web, siteliner, etc. |

## RECOMMENDED BOOKS


1. **Digital Marketing** by E Balagurusamy,Tata McGraw Hill EducationPvt. Ltd, New Delhi
2. **Fundamentals of Digital Marketing** by Puneet Bhatia, published by Pearson.
3. **Computers Today** by SK Basandara, Galgotia publication Pvtltd. Daryaganj, New Delhi.

# SCHOOL OF ENGINEERING & TECHNOLOGY

## OFFICE AUTOMATION LAB

## (DE-CSE-23217)

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## JUSTIFICATION

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

## LEARNING OUTCOMES

After completing this course, students will be able to:

1. Identify Computer Hardware Components, Network Components and Peripherals.
2. Explain the role of an Operating System.
3. Install System and Application Software.
4. Explain the function of the system components including Processor, Motherboard and Input-output devices.
5. Use Word Processing Software to prepare document.
6. Use Spreadsheet Software to create workbooks and automate calculation.
7. Use Presentation Software to create interactive presentation.
8. Perform fundamental tasks common to most application software including print, scan,save, edit, cut, copy, paste, format, spell and grammar check.
9. Use online office tools(Google suits)
10. Install Antivirus.

## DETAILED CONTENTS

1. Identify various components, peripherals of computer and list their functions.
2. Installation of various application software and peripheral drivers
3. Installation of operating system (windows/linux/others)
4. Creation and Management (Rename, delete, search of file and folders)
5. Installation of Antivirus and remove viruses
6. Scanning and printing documents
7. Browsing, Downloading, Information using Internet
8. E-Mail ID creation, comparing, sending and receiving e-mail. Attaching a file with e-mail message.
9. **Word Processing (MS Office/Open Office)**

   a) File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file

   b) Page set up: Setting margins, tab setting, ruler, indenting

   c) Editing a document: Entering text, cut, copy, paste using tool- bars

   d) Formatting a document: Using different fonts, changing font size and colour, changing the appearance through bold/italic/underlined, highlighting a text, changing case, using subscript

and superscript, using different underline methods, Aligning of text in a document, justification of document, inserting bullets and numbering Formatting paragraph, inserting page breaks and column breaks, line spacing, Use of headers, footers: Inserting footnote, end note, use of comments, autotext, Inserting date, time, special symbols, importing graphic images, drawing tools

e) Tables and Borders: Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table, Print preview, zoom, page set up, printing options Using find, replace options

f) Using Tools like: Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and lables, Using shapes and drawing toolbar, Working with more than one window.

10. **Spread Sheet Processing (MS Office/Open Office/Libre Office)**

a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets

b) Menu commands: Create, format charts, organise, manage data, solving problem by analyzing data. Programming with Excel Work Sheet, getting information while working

c) Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting

d) Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data, Using a list to organize data, sorting and filtering data in list

e) Retrieve data with query: Create a pivot table, customizing a pivot table. Statistical analysis of data

f) Exchange data with other application: Embedding objects, linking to other applications, import, export document.

11. **PowerPoint Presentation (MS Office/Open Office/Libre office)**

a) Introduction to PowerPoint: How to start PowerPoint, Working environment: concept of toolbars, slide layout & templates, Opening a new/existing presentation Different views for viewing slides in a presentation: normal, slide sorter.

b) Addition, deletion and saving of slides

c) Insertion of multimedia elements

Adding text boxes, Adding/importing pictures, Adding movies and sound. Adding tables and charts etc. , Adding organizational chart Editing objects, Working with Clip Art

d) Formatting slides

Using slide master, Text formatting, Changing slide layout, Changing slide colour scheme, Changing background, Applying design template

12. Google Suits Using Google drive, Google shut, Google docs, Google slides

## RECOMMENDED BOOKS


1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

Computer Fundamentals by PK Sinha; BPB Pu

# Semester 3rd

# SCHOOL OF POLYTECHNIC

## APPLIED MATHEMATICS - III

(SPB01230301)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 6: Matrices** **08 Periods**

1.9 Algebra of Matrices, Inverse Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermit ion, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix. Definition and Computation of inverse of a matrix

1.10 Elementary Row/Column Transformation, Meaning and use in computing inverse and rank of a matrix

1.11 Linear Dependence, Rank of a Matrix: Linear dependence/independence of vectors, Definition and computation of rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors, Consistency of equations

1.12 Eigen Pairs, Cayley-Hamilton Theorem: Definition and evaluation of Eigen values and Eigen vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof)and its verification, Use in finding inverse and powers of a matrix

**UNIT 7: Differential Calculus** **10 Periods**

2.1 Function of two variables, identification of surfaces in space, conicoids

2.2 Partial Differentiation: Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, Higher order derivatives, Euler's theorem for homogeneous functions, Jacobians.

2.3 Vector Calculus: Vector function, Introduction to double and triple integral, differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives.

**UNIT 8: Differential Equation** **10 Periods**

3.1 Formation, Order, Degree, Types, Solution: Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, nonlinear equation.

3.2 First Order Equations: Variable separable, equations reducible to separable forms, Homogeneous equations, equations reducible to homogeneous forms, Linear

and Bernoulli form exact equation and their solutions.

3.3 Higher Order Linear Equation: Property of solution, Linear differential equation with constant coefficients (PI for X= $e^{ax}$, Sinax, Cosax, $X^n$, $e^{ax}V$, XV)

3.4 Simple Applications: LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

**UNIT 9: Integral Calculus-II** **08 Periods**

4.1 Beta and Gamma Functions: Definition, Use, Relation between the two, their use in evaluating integrals.

4.2 Fourier Series: Fourier series of f(x),-n<x<n, Odd and even function, Half range series.

4.3 Laplace Transform: Definition, Basic theorem and properties, Unit step and Periodic functions, inverse laplace transform, Solution of ordinary differential equations

**UNIT 10: Probability and Statistics** **06 Periods**

5.1 Probability: Introduction, Addition and Multiplication theorem and simple problem

5.2 Distribution Discrete and continuous distribution, Binomial Distribution, Poisson distribution, Normal Distribution.

## TEXT BOOKS


9. **Applied Mathematics-III** by Ajay Kumar, Jai Prakash Nath Publications, Meerut.
10. **Applied Mathematics-III** by P.K. Gupt, Pooja Yadav, Asian Publishers, Muzaffarnagar.


## REFERENCE BOOKS


1. **Elementary Engineering Mathematics** by BS Grewal, Khanna Publishers, New Delhi
2. **Engineering Mathematics, Vol I & II** by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3. **Applied Mathematics-III** by Chauhan and Chauhan, Krishna Publications, Meerut.
4. **Applied Mathematics-II** by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.

# SCHOOL OF POLYTECHNIC

## ADVANCE WEB DESIGNING

## (SPB01230302)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction to HTML:** **06 Periods**

1.1 Brief Introduction of HTML, HTML Tags, Basic structure of an HTML document, Heading-Paragraphs, Line Breaks

1.2 **Elements of HTML**: Introduction to elements of HTML, Working with Text, Formatting Tags, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls, Marquee Elements

**UNIT 2: Introduction to Cascading Style Sheets:** **10 Periods**

2.1 Concept of CSS, Creating Style Sheet, CSS Properties,
CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin , properties) Navigation Bar, CSS Color, Creating page
Layout and Site Designs.

**UNIT 3: BOOTSTRAP:** **08 Periods**

3.1 Fundamentals of implementing responsive web design. Use Balsamiq to mockup and wireframe websites, The fundamentals of UI design for websites ,How to install the Bootstrap framework

3.2 Understanding the Bootstrap grid layout system, How to use bootstrap containers to layout your website easily, Use other Bootstrap components such as buttons, Adding symbols using Font Awesome, Bootstrap carousels.

3.3 Add Bootstrap cards to your website. Using Bootstrap navigation bars.

**UNIT 4: JAVA SCRIPT :** **08 Periods**

4.1 The Fundamentals of Code ,Starting code with alerts and prompts, Understand Variables and Data Types in JavaScript Variable naming in JS, Working with strings and numbers Randomisation and logical operators Loops, collections and Conditionals ,Functions and invocation patterns Discussion of ECMAScript Intermediate JavaScript, JS Expressions, Operators, Statements and Declarations, Object-Oriented Programming JS Objects and Prototypes ,`This`, Scope and Closures Objects and Prototypes Refactoring and Debugging

**UNIT 5: REACT JS:** **10 Periods**

5.1 Learn front-end development with React ,Understand when and how to use React Components ,Props and work with them ,JSX and understand JSX syntax, React DOM, State Management in React ,React Hooks, Conditional rendering in React

5.2 Understand the difference between class and functional components, Event Handling in React

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Fundamental Notations & Arrays** **10 Periods**

1.13 Fundamental Notations: Problem solving concept top down and bottom up design, structured programming, Concept of data types, variables and constants, Concept of pointer variables and constants, Categories of Data structure

1.14 Arrays: Concept of Arrays, Storage representation of multi-dimensional arrays, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

**UNIT 2: Linked Lists** **10 Periods**

2.1 Introduction to linked list , Representation of linked lists in Memory, Operations on linked list (Insertion, deletion and traversals), Application of linked lists 3.5 Doubly linked lists, Operations on doubly linked lists (Insertion, deletion and traversals)

**UNIT 3: Stacks, Queues and Recursion** **08 Periods**

3.1 Stack: Introduction to stacks, Representation of stacks, Implementation of stacks, Applications of stacks

3.2 Queue: Introduction to queues, Implementation of queues , Circular Queues, De-queues, Application of Queues

3.3 Recursion: Introduction to Recursion

**UNIT 4: Trees and Graphs** **08 Periods**

4.1 Trees: Concept of Trees, Representation of Binary tree in memory , Traversing Binary Trees (Pre order, Post order and In order), Searching, inserting and deleting binary search trees, Introduction to Heap, Application of Trees

4.2 Graphs: Introduction to Graph , Basic Operations, Depth First Search, Breadth First Search

**UNIT 5: Sorting and Searching** **06 Periods**

5.1 Introduction to sorting and searching, Search algorithm (Linear and Binary), Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort

## TEXT BOOKS


8. **Data Structure using 'C'** by Satish Gupta; Jai Prakash Nath Publications, Meerut


## REFERENCE BOOKS


1. **Data Structure using C** by Robert Kruse; Prentice Hall of India
2. **Data Structure through C** by Yashwant Kanekar; BPB Publications
3. **Data structures – Schaum's Outline Series** by Lipschutz; McGraw Hill Education Pvt Ltd , New Delhi
4. **Data Structure using C** by ISRD Group ; Tata McGraw Hills Education Pvt Ltd , New Delhi

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction to Data Communication** **08 Periods**

1.1 Basics of the Communications
1.2 Direction of the Data flow (simplex, half-duplex, full-duplex)
1.3 Network Topologies, signals and transmission (analog and digital)
1.4 Transmission media (guided and unguided)
1.5 Concept of digital signals, Bit rate, Bit length, Transmission impairment (Attenuation, distortion, noise.

**UNIT 2: Communication Methodologies** **08 Periods**

2.1 Need for modulation in communication system.
2.2 Concepts AM, FM, PM, FSK, TSK, PCM (No Mathematical model)
2.3 Concept of bandwidth and channel capacity of different communication systems such as radio, microwave etc
2.4 Multiplexing techniques (TDM, FDM, WDM,CDMA)

**UNIT 3: Networks Basics** **10 Periods**

3.1 Concept of network, Models of network computing,
3.2 Networking models , Peer-to –peer Network, LAN, MAN and WAN
3.3 Network Services, Switching Techniques.
3.4 OSI model: Definition, Layered Architecture Functions of various layers
3.5 TCP/IP Model: Definition, Functions of various layers Comparison between OSI TCP/IP model, IPV4 Header IPV6 Header
Comparison between IPV4 and IPV6

**UNIT 4: Network Architecture , Network Connectivity** **08 Periods**

4.1 Ethernet specification and standardization: 10 Mbps (Traditional Ethernet), 10 Mbps (Fast Ethernet) and 1000 Mbps (Gigabit Ethernet)
4.2 Network connectivity Devices, NICs
4.3 Hubs, Switches, Routers, Repeaters, Modem, Gateway
4.4 Configuration of Routers & Switches
4.5 Trouble Shooting Tools: PING,IPCONFIG, IFCONFIG, NETSTAT, TRACEROOT

**UNIT 5: Introduction to Wireless Networks** **08 Periods**

5.1 DHCP Server Workgroup/Domain Networking
5.2 Introduction to wireless LAN IEEE 802.11, WiMax and Li-Fi
5.3 Wireless Security
5.4 Introduction to Bluetooth - architecture, application
5.5 Comparison between Bluetooth and Wi-Fi

## TEXT BOOKS

1. **Data Communication and Computer Networks (With Practicals)** by Priyam Tayal, Asian Publishers, Muzaffarnagar.
2. **Data Communication and Computer Network** by Kumar, Singh, Joshi, Ali; Jai Prakash Nath Publications, Meerut.

## REFERENCE BOOKS

1. **Computer Networks** by Tanenbaum, Prentice Hall of India, New Delhi
2. **Data Communications and Networking** by Forouzan, (Edition 2nd and 4th),
3. **Tata McGraw** Hill Education Pvt Ltd, New Delhi.
4. **E-books/e-tools/relevant software to be used as REFERENCEby AICTE/NITTTR, Chandigarh.**

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 6: Introduction and Number System** — **6 Periods**

1.1 Distinction between Analog and Digital signals, Applications, and advantages of Digital Signals

1.2 Number System: Binary, Octal and Hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa, Binary addition and subtraction including binary points. 1's and 2's complement method of addition/subtraction.

**UNIT 7: Logic Gates and Simplifications** — **08 Periods**

2.1 Concept of negative and positive logic, Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND & NOR as universal gates, SSI, MSI, LSI, VLSI, Propagation delay, Noise Margin, Fan In, Fan Out, Power dissipation, Basic Logic Gate using NMOS, PMOS, CMOS.

2.2 Postulates of Boolean Algebra, De Morgan's Theorems, Implementation of Boolean (logic) equation with gates, Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits.

**UNIT 8: Arithmetic & Combinational Circuits, Counters** — **10 Periods**

Half adder and Full adder circuit, design and implementation, Half subtractor and Full subtractor or Circuit, design and implementation.

Introduction to combinational circuit, Multiplexer, De-multiplexer, Encoder, Decoder block diagram and Circuit, 7 segment decoder, BCD Encoder Circuit.

Introduction to Asynchronous and Synchronous counters, Binary counters, Divide by N ripple counters, Decade counter, Ring counter, Twisted Ring Counter.

**UNIT 9: Sequential Circuit and Shift Registers** — **10 Periods**

Introduction, comparison between combinational and sequential circuit, concept and types of latch with their working and applications, operation using waveforms and truth tables of RS, T, D, Master/Slave JK flip flops, Difference between a latch and a flip flop.

Introduction and basic concepts including shift left and shift right.

a) Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out.

b) Universal shift register

**UNIT 10: A/D and D/A Converters, Semiconductor Memories** — **08 Periods**

Working principle of A/D and D/A converters, Applications of A/D and D/A converter, Memory organization, classification of semiconductor memories (RAM, ROM, PROM, EPROM, EEPROM), static and dynamic RAM.

## TEXT BOOKS

5. **Digital Electronics** by Ashish Tripathi, Jai Prakash Nath Publications, Meerut.

## REFERENCE BOOKS

1. **Digital Logic Designs** by Morris Mano, Prentice Hall of India, New Delhi
2. **Digital Electronics** by RP Jain, Tata McGraw Hill Education Pvt Ltd, New Delhi

# SCHOOL OF POLYTECHNIC

## ENVIRONMENTAL STUDIES

(SPB01230306)

| L | T | P |
|---|---|---|
| 2 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 11: Introduction** **6 Periods**

1.1 Basics of ecology, ecosystem- concept, and sustainable development, Resources renewable and non-renewable, Global Warming, Green House Effect, Acid Rain, Concept of Green Building

**UNIT 12: Air Pollution & Water Pollution** **08 Periods**

2.1 Source of air pollution. Effect of air pollution on human health, economy, plant, and animals. Air Pollution Control Methods. Introduction to Air Pollution and its Prevention and Control Act 1981 & Environmental Protection Act 1986 and Function of State Pollution Control Board and National Green Tribunal (NGT).

2.2 Impurities in water, Cause of water pollution, Source of water pollution. Effect

Of water pollution on human health, Concept of dissolved O2, BOD, COD.

Prevention of water pollution- Water treatment processes, Sewage treatment, Introduction to Water (Prevention and Control of Pollution) Act 1974.

**UNIT 13: Soil Pollution** **06 Periods**

3.1 Sources of soil pollution

3.2 Types of Solid waste- House hold, Hospital, From Agriculture, Biomedical, Animal and human waste, excreta, sediments and E-waste, and plastic waste.

3.3 Effect of Solid waste, Disposal of Solid Waste- Solid Waste Management

**UNIT 14: Noise pollution & Disaster Causes and Hazards** **06 Periods**

4.1 Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimize noise pollution.

4.2 **Disaster Causes and Hazards:** Introduction, Classification of Natural Disasters, Classification of Natural Disasters in India, Earthquake, Tsunami, Flood, Drought, Land Slide, Thunderstorm and Lightening.

**UNIT 15: Disaster Management** **06 Periods**

5.1 Framework, Yokohama Strategy for a Safer World (1999), The Hyogo Framework for Action (HFA) (2005-2015), Sendai Framework for Action (SDGS) (2015-2030), Disaster Management, Preparedness and Response in India, National Disaster Management Authority (NDMA) Guidelines

5.2 National Policy on Disaster Management (2009), National Disaster Management Act (2005), NDRF (National Disaster Response Force), SDRF (State Disaster Response Force), DDRF (District Disaster Response Force), and Aapda Mitra, Case studies of disaster management efforts: COVID-19 Pandemic, Earthquakes, Firefighting, Thunder Storm and Lightning

## TEXT BOOKS

6. **Environmental Education & Disaster Management** by M.K.; Asian Publishers, Muzaffarnagar.
7. **Environmental Education & Disaster Management** by Sharma, Rai, and Chamola; Jai Prakash Nath Publishers, Meerut.

## REFERENCE BOOKS

1. **Environmental and Pollution Awareness** by Sharma BR; Satya Prakashan, New Delhi.
2. **Environmental Protection Law and Policy in India** by Thakur Kailash; Deep and Deep Publications, New Delhi.
3. **Environmental Pollution** by Dr. RK Khitoliya; S Chand Publishing, New Delhi
4. **Environmental Science** by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd.

# SCHOOL OF POLYTECHNIC

## ADVANCE WEB DESIGNING LAB

(SPB01230352)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

1. Html program to display a table with 5 rows and 4 columns. Provide appropriate heading to the form.
2. Create an HTML Page to display the following table:

| First Name | Last Name | Points |
|---|---|---|
| Eve | Jackson | 94 |
| John | Doe | 80 |
| Adam | Johnson | 67 |
| Jill | Smith | 50 |

3. HTML page to demonstrate a Clickable image.
4. Create a hyperlink in html which when clicked links to www.google.com in a new window.
5. HTML program segment that contains hypertext links from one document to another.
6. Html code to design multiple lists.
7. HTML code for creating the following output:

**Online Courses**

1. Web Programming
   - HTML5
   - CSS3
   - JavaScript

2. PHP Framework
   - Laravel
   - Cupcake
   - Slim

**25% Discount for first ten students Contact us on 9900990000**

8. Html code to design complex nested list.
9. Create a webpage divide the webpage into six frames in one frame create five links that will display different HTML forms in the remaining five frames respectively.
10. Design a html from for o level registration.
11. Html code to develop a web page having two frames that divide the page into two equal rows and divide the first row into equal columns.
12. Css code to create 3 different colors box which partially overlapped to each other.

## SCHOOL OF POLYTECHNIC

### DATA STRUCTURES USING C LAB

(SPB01230353)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Write a C program for addition of two matrices using functions. | |
| 2 | Write a C program for multiplication of two matrices. | |
| 3 | Write a C program to demonstrate insertion and deletion of elements in linked list. | |
| 4 | Write a C program to demonstrate insertion and deletion of elements in doubly linked list. | |
| 5 | Write a C program to demonstrate push and pop operation in stack. | |
| 6 | Write a C program for inserting and deleting elements in queue. | |
| 7 | Write a C program for inserting and deleting elements in circular queue. | |
| 8 | Write a C program to find factorial of a given number with recursion and without recursion. | |
| 9 | Write a C program to print Fibonacci series with recursion and without recursion. | |
| 10 | Write a C program for demonstrating pre-order, post-order and in-order traversal of binary tree. | |
| 11 | Write a C program to demonstrate the selection sort technique. | |
| 12 | Write a C program to demonstrate the bubble sort technique. | |
| 13 | Write a C program to demonstrate the quick sort technique | |
| 14 | Write a C program to demonstrate the merge sort technique | |
| 15 | Write a C program for applying the binary search procedures to search an element in a given list. | |
| 16 | Write a C program for applying the linear search procedures to search an element in a given list. | |

# SCHOOL OF POLYTECHNIC

## DATA COMMUNICATION AND COMPUTER NETWORK LAB

(SPB01230354)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network. | |
| 2 | Recognition and use of various types of connectors RJ-45, RJ-11, BNC and SCST. | |
| 3 | Making of cross cable and straight cable. | |
| 4 | Install and configure a network interface card in a workstation. | |
| 5 | Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation. | |
| 6 | Managing user accounts in windows and LINUX. | |
| 7 | Sharing of Hardware resources in the network. | |
| 8 | Use of Netstat and its options. | |
| 9 | Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG. | |
| 10 | Installation of Network Operating System (NOS). | |
| 11 | Create a network of at least 6 computers. | |
| 12 | Visit to nearby industry for latest networking techniques. | |

# SCHOOL OF POLYTECHNIC

## DIGITAL ELECTRONICS LAB

(SPB01230355)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR (EXNOR) gates. | |
| 2 | Realisation of logic functions with the help of NAND or NOR gates. | |
| 3 | - Design of a half adder using XOR and NAND gates and verification of its operation.<br>- Construction of a full adder circuit using XOR and NAND gates and verify its operation. | |
| 4 | Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch, D flip-flop, JK flip-flops). | |
| 5 | Verification of truth table for encoder and decoder ICs, Mux and DeMux. | |
| 6 | To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and verification of their operation. | |
| 7 | To design a 4 bit ring counter and verify its operation. | |
| 8 | Use of Asynchronous Counter ICs (7490 or 7493). | |

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Determination of pH of drinking water. | |
| 2 | Determination of TDS in drinking water. | |
| 3 | Determination of TSS in drinking water. | |
| 4 | Determination of hardness in drinking water. | |
| 5 | Determination of oil & grease in drinking water. | |
| 6 | Determination of alkalinity in drinking water. | |
| 7 | Determination of acidity in drinking water. | |
| 8 | Determination of organic/inorganic solid in drinking water. | |
| 9 | Determination of pH of soil. | |
| 10 | Determination of N&P (Nitrogen & Phosphorus) of soil. | |
| 11 | To measure the noise level in classroom and industry. | |
| 12 | To segregate the various types of solid waste in a locality. | |
| 13 | To study the waste management plan of different solid waste. | |
| 14 | To study the effect of melting of floating ice in water due to global warming. | |

# Semester 4th

(SPB01230401) **3 0 0**

## DETAILED CONTENTS

**UNIT 1: INTRODUCTION** **06 Periods**

1.1 Introduction to Computer Graphics, Types of Computer Graphics, Application of Computer Graphics, Design and Drawing, Animation, Introduction to Multimedia & its applications, Multimedia System Architecture, Simulation.

**UNIT 2: GRAPHIC DEVICES** **08 Periods**

2.1 Communication devices, Storage devices.

2.2 Display Devices: Random Scan, Raster Scan Monitors, Color CRT Monitor, DVST and Plasma Panel.

**UNIT 3: COMPRESSION/DECOMPRESSION & FILE FORMATS** **08 Periods**

3.1 Need, Types, Evaluating & Visibility, Video Compression Technique, Introduction to Standardization of Algorithm, File Formats, History of RIF, TIFF, Introduction to RIFF, AVI, JPEG-objectives, Architecture, JPEG-DCT encoding, Quantization, JPEG-stastical coding, predictive lossless coding, JPEG-performance, MPEG objectives, Architecture, BIT stream syntax performance, MPEG2 & MPEG4.

**UNIT 4: MULTIMEDIA AUTHORING , USER INTERFACE AND TOOLS** **15 Periods**

4.1 Multi Media Authoring System and its type, Hypermedia Application Design consideration, User Interface Design, Information Access, Object Display/ Playback Issues.

4.2 Introduction to Multimedia tool – Flash, Creating & Modifying elements, Line tool, fill/attributes, different shapes, text tools & pen tool, Selecting lines fill with arrow tool, selecting shapes, using lasso tool, performing basic editing tools, selecting & deselecting elements, modifying created objects.

**UNIT 5: Animation** **06 Periods**

5.1 Definition, History of Animation, Types of Animation – 2D and 3D, Basic principles of animation.

## TEXT BOOKS

1. **Multimedia and Animation** by Rahul Wadhwa, Asian Publishers, Muzaffarnagar.

## REFERENCE BOOKS

1. **Fundamentals of Computer Graphics and Multimedia** by Mukherjee, D. P., PHI.
2. **Principles of Multimedia** by Parikh, Tata McGraw Hill Education Pvt Ltd, New Delhi.
3. **Multimedia Technologies** by Banerji, Tata McGraw Hill Education Pvt Ltd, New Delhi.
4. **Photo-shop for Windows Bible** by Deke Maclelland IDG Books India Pvt. Ltd., New Delhi.
5. **Flash 5 in easy steps** by Vandome IDG Books India Pvt. Ltd.

(SPB01230402) **3 0 0**

## DETAILED CONTENTS

**UNIT 1: Database System Concept** **06 Periods**

1.1 Basic concepts, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Data Independence. , Components of a DBMS and overall structure of a DBMS. ,Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence, , Client Server Architecture

**UNIT 2: Data Modeling** **10 Periods**

2.1 Define data model, Data Models : Network Model Hierarchical Model, E-R Model,

Advantage & Disadvantages of each Data Model

2.2 ER Model: Entity sets and relationship sets- Attributes - Keys in entity and relationship sets : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key - Mapping constraints, Participation Constraint, E-R diagram, Notations. Strong Entity Set and Weak Entity set.

2.3 Relation Model: Advantages, Disadvantages, Codd's 12 rules, Definition of Relations, Schema, Sub schema. Relational Model Constraints (Domain, Tuple Uniqueness, Key Constraints, Integrity Constraints, Entity constraints).

Relations algebra (Basic operation: Union intersection difference and Cartesian product), Additional Relational Algebraic Operations (Projection, Selection rows, Division, rename and join), Converting ER Model to Relational Model.

**UNIT 3: Normalization** **08Periods**

3.1 Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF , Forth Normal Form, Fifth Normal Form

**UNIT 4: MYSQL/SQL** **12 Periods**

4.1 Data definition language, Data manipulation language, SQL, Object naming conventions, Object naming guidelines, Data types, Tables (Creating , Inserting , Updating and deleting tables and using constraints), Views, Indexes, SQL Command :- DESCRIBE, SELECT, WHERE CLAUSE, DISTINCT CLAUSE, ORDER BY,HAVING, LOGICAL OPERATIONS, SQL OPERATORS, JOIN, aggregate functions, String functions and date time functions, Null values

4.2 PL-SQL: User defined function, Control of flow statement of PL/SQL, Procedures/Stored procedures, transaction, triggers, cursors, granting and revoking.

4.3 NO-SQL: Introduction, Usages, And Application.

**UNIT 5: SECURITY** **06 Periods**

5.1 Authorization and View- Security constraints - Integrity Constraints- Encryption

## TEXT BOOKS

1. **Database Management System** – Rashmi Singh, Jai Prakash Nath Publications.

## REFERENCE BOOKS


1. **An Introduction to Database System** - C. J. Date.
2. **Database System Concepts** - A. Silberschatz, S. Sudarshan& H. F. Korth.
3. **Database Concepts and Systems –** Lvan Bayroos/SPD.
4. **Fundamental of Database System** - R. Elmashri & S. B. Navathee.

## DETAILED CONTENTS

| | | |
|---|---|---|
| **UNIT 1:** | **Introduction and Language Constructs** | **12 Periods** |
| 1.1 | Introduction to OOP: Procedure-oriented Programming versus Object Oriented Programming (OOP.) Object oriented programming concepts – Classes, object, object reference | |
| 1.2 | Abstraction, encapsulation, inheritance, polymorphism, Introduction of eclipse (IDE) for developing programs in Java | |
| 1.3 | Language Constructs: variables, types and type declarations, data types: Integer, floating point type, character, Boolean, all Operators. | |
| 1.4 | Iteration and jump statement, if then else clause; conditional expressions, input using scanner class and output statement, Loops, switch case, arrays, methods. | |
| **UNIT 2:** | **Classes and Objects** | **08 Periods** |
| 2.1 | Class fundamentals, constructors, declaring objects (Object & Object Reference), creating and accessing variables and methods, static and non-static variables/methods defining packages, | |
| 2.2 | Creating and accessing a package, Importing packages, Understanding CLASSPATH, auto boxing , String , String Buffer | |
| **UNIT 3:** | **Inheritance and Polymorphism** | **08 Periods** |
| 3.1 | Definition of inheritance, protected data, private data, public data, constructor chaining, order of invocation, types of inheritance, single inheritance, multilevel inheritance, hierarchical inheritance, hybrid inheritance , access control (Private Vs. Publics Protected Vs. Default) | |
| 3.2 | Polymorphism Method and constructor overloading, method overriding, up-casting and down-casting. | |
| **UNIT 4:** | **Abstract Class and Interface** | **08 Periods** |
| 4.1 | Defining an interface, difference between classes and interface, Key points of Abstract class & interface, difference between an abstract class & interface, implementation of multiple inheritances through interface. | |
| **UNIT 5:** | **Exception Handling and Multithreading** | **06 Periods** |
| 5.1 | Definition of exception handling, implementation of keywords like try, catches, finally, throw& throws, built in exceptions, Creating own exception sub classes importance of exception handling in practical implementation of live projects | |
| 5.2 | Multithreading: Difference between multi-threading and multi-tasking, thread life cycle, creating threads, thread priorities, synchronizing threads | |

## TEXT BOOKS


1. Object Oriented Programming using Java: Bajpayi & Sharma; Jai Prakash Nath Publications, Meerut.


## REFERENCE BOOKS


1. **Programming with Java:** A Primer; E. Balagurusamy**.**
2. **Head First Java,** O-REILLY, Kathy Sierra & Bert Bates.
3. **OCA Java SE Programmer I Certification Guide**, Wiley Publisher , Mala Gupta

4. **PROGRAMMER'S GUIDE TO JAVA SE 8,** Pearson, Khalid E Mughal High School**.**

## SCHOOL OF POLYTECHNIC

# OPERATING SYSTEMS

(SPB01230404)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Overview of Operating Systems** **05 Periods**

1.1 Definition of Operating Systems, Types of Operating Systems, Operating System Services, User operating system interface, System Calls, Types of System Calls, System Programs, Operating System Structure, Virtual Machine, Benefits of Virtual Machine

**UNIT 2: Process Management and CPU Scheduling** **15 Periods**

2.1 Process concept, Process State, Process Control Block, Scheduling Queues, Scheduler, Job Scheduler, Process Scheduler, Context Switch, Operations on Processes, Interprocess Communication, Shared Memory Systems, Message Passing Systems, CPU Scheduler, Scheduling Criteria, Scheduling Algorithms, Preemptive and Non Preemptive, First come first serve (FCFS), Shortest Job first (SJF), Round Robin (RR), Multiprocessor scheduling, Process Synchronization.

2.2 Deadlock, Conditions for Dead lock, Methods for handling deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock detection, Recovery from deadlock.

**UNIT 3: Memory Management Function** **08 Periods**

3.1 Definition – Logical and Physical address Space, Swapping, Memory allocation, Contiguous Memory allocation, Fixed and variable partition, Internal and External fragmentation and Compaction, Paging – Principle of operation, Page allocation, Hardware support for paging, Protection and sharing, Disadvantages of paging, Segmentation, Virtual Memory.

**UNIT 4: I/O Management Functions and File Management** **08 Periods**

4.1 **I/O Management:** Dedicated Devices, Shared Devices, I/O Devices, Storage Devices, Buffering, Spooling.

4.2 **File Management:** Types of File System; Simple file system, Basic file system, Logical file system, Physical file system, Various Methods of Allocating Disk Space

**UNIT 5: Linux Operating System** **06 Periods**

5.1 History of Linux and Unix, Linux Overview, Structure of Linux, Linux releases, Open Linux, Linux System Requirements, Linux Commands and Filters: mkdir, cd, rmdir, pwd, ls, who, whoami, date, cat, chmod, cp, mv, rm, pg, more, pr, tail, head, cut, paste, nl, grep, wc, sort, kill, write, talk, mseg, wall, merge, mail, news Shell: concepts of command options, input, output, redirection, pipes, redirecting and piping with standard errors, Shell scripts, vi editing commands.

## TEXT BOOKS


1. **Operating System** by Monika Sharma; Jai Prakash Nath Publications, Meerut.
2. **Operating System** by Shashank Chaudhary; Jai Prakash Nath Publications, Meerut.

## REFERENCE BOOKS


1. **Operating System Concepts** by Silberschatz, Galvin; Wiley Publication
2. **Operating Systems** by Stallings; Tata McGraw Hill.
3. **Operating Systems** by Achyut S Godbole and AtulKahate; Tata McGraw Hill Education Pvt Ltd , New Delhi
4. **Unleashed Linux** by Tech Media Publishers, New Delhi

| L | T | P |
|---|---|---|
| 2 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 6: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education** — **4 periods**

1.1 Understanding the need, basic guidelines, content and process for Value Education.

1.2 Self-Exploration–what is it? – its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration.

1.3 Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority.

1.4 Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.

**UNIT 7: Understanding Harmony in the Human Being - Harmony in Myself!** — **4 Periods**

2.1 Understanding human being as a co-existence of the sentient 'I' and the material the Body'.

2.2 Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha.

2.3 Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

2.4 Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail

**UNIT 8: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship** — **6 Periods**

3.1 Understanding Harmony in the family – the basic unit of human interaction.

3.2 Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; a. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

3.3 Understanding the meaning of Vishwas; Difference between intention and competence.

3.4 Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.

3.5 Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitvaas comprehensive Human Goals

3.6 Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj)

**UNIT 9: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence** — **4 Periods**

4.1 Understanding the harmony in the Nature.

4.2 Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature.

4.3 Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space.

4.4 Holistic perception of harmony at all levels of existence.

**UNIT 10: Implications of the above Holistic Understanding of Harmony on Professional Ethics** — **6 Periods**

5.1 Natural acceptance of human values.

5.2 Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order.

5.3 Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers.

b) At the level of society: as mutually enriching institutions and organizations.

5.4 To inculcate Human Values among Students: The Role of self, Parents and Teachers.

## TEXT BOOKS

1. **Universal Human Values** by Ankit Kumar, Jai Prakash Nath Publications, Meerut.
2. **Universal Human Values** by Archana Sharma & Iftekhar Ahmed, Asian Publisher, Muzaffarnagar.

## REFERENCE BOOKS


1. R.R Gaur, R Asthana, G P Bagaria**, A foundation course in Human Values and professional Ethics,** Excel books, New Delhi
2. B L Bajpai, 2004, **Indian Ethos and Modern Management,** New Royal Book Co., Lucknow. Reprinted 2008.
3. PL Dhar, RR Gaur, 1990, **Science and Humanism,** Commonwealth Publishers.

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Installation of various multimedia software like Photoshop/GIMP, Blender, Flash, Director or any open source software. | |
| 2 | Installing and use of various multimedia devices<br>– Scanner<br>– Digital camera, web camera<br>– Mike and speakers<br>– Touch screen<br>– Plotter and printers<br>– DVD<br>– Audio CD and Video CD | |
| 3 | Reading and writing of different format on CD/DVD. | |
| 4 | Transporting audio and video files. | |
| 5 | Using various features of Flash. | |
| 6 | Using various features of Photo-shop/GIMP. | |
| 7 | Using various features of Blender. | |
| 8 | Making multimedia presentations combining, Flash, Photo-shop/GIMP, such as department profile, lesson presentation, games and project presentations. | |

## DATABASE MANAGEMENT SYSTEM LAB

(SPB01230452)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Creating Database :<br>– Creating a database<br>– Creating a table<br>– Specifying relational data types<br>– Specifying constraints<br>– Creating indexes | |
| 2 | Table and Record Handling:<br>– INSERT statement<br>– Using SELECT and INSERT together<br>– DELETE, UPDATE, TRUNCATE Statement.<br>– DROP, ALTER statement | |
| 3 | Retrieving Data From a Database<br>The SELECT statement<br>– Using the WHERE clause<br>– Using Logical Operators in the WHERE clause<br>– Using In, BETWEEN, LIKE, ORDER BY, GROUP BY & HAVING clause<br>– Using Aggregate Functions<br>– Combining Tables Using JOINS | |
| 4 | Design of database for any application. | |

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

<table>
<tr><td>1</td><td>WAP to create a simple class to find out the area and perimeter of rectangle and box using super and this keyword</td><td></td></tr>
<tr><td>2</td><td>WAP to design a class account using the inheritance and static that show all function of bank (withdrawal, deposit).</td><td></td></tr>
<tr><td>3</td><td>WAP to design a class using abstract methods and classes</td><td></td></tr>
<tr><td>4</td><td>WAP to design a string class that perform string method (equal, reverse the string, change case).</td><td></td></tr>
<tr><td>5</td><td>Consider we have a Class of Cars under which Santro Xing, Alto and Wagon R represents individual Objects. In this context each Car Object will have its own, Model, Year of Manufacture, Colour, Top Speed, etc. which form Properties of the Car class and the associated actions i.e., object functions like Create(), Sold(), display() form the Methods of Car Class.</td><td></td></tr>
<tr><td>6</td><td>In a software company Software Engineers, Sr. Software Engineers, Module Lead, Technical Lead, Project Lead, Project Manager, Program Manager, Directors all are the employees of the company but their work, perks, roles, responsibilities differs. Create the Employee base class would provide the common behaviours of all types of employee and also some behaviours properties that all employee must have for that company.</td><td></td></tr>
<tr><td>7</td><td>Using the concept of multiple inheritance create classes: Shape, Circle, Square, Cube, Sphere, Cylinder. Your classes may only have the class variable specified in the table below and the methods Area and/or Volume to output their area and/or volume.
<table>
<tr><th>Class</th><th>Class Variable</th><th>Constructor</th><th>Base Class</th></tr>
<tr><td>Shape</td><td>String name</td><td>Shape()</td><td></td></tr>
<tr><td>Circle</td><td>double radius</td><td>Circle (double r, String n)</td><td>Shape</td></tr>
<tr><td>Square</td><td>double side</td><td>Square (doubles, string n)</td><td>Shape</td></tr>
<tr><td>Cylinder</td><td>double height</td><td>Cylinder(double h, double r, String n )</td><td>Circle</td></tr>
<tr><td>Sphere</td><td>None</td><td>Sphere( double r, String n )</td><td>Circle</td></tr>
<tr><td>Cube</td><td>None</td><td>Cube( doubles, String n )</td><td>Square</td></tr>
</table></td><td></td></tr>
<tr><td>8</td><td>WAP to handle the exception using try and multiple catch blocks.</td><td></td></tr>
<tr><td>9</td><td>WAP that implement the Nested try statements.</td><td></td></tr>
<tr><td>10</td><td>WAP to create a package that access the member of external class as well as same package.</td><td></td></tr>
<tr><td>11</td><td>WAP that show the partial implementation of interface.</td><td></td></tr>
<tr><td>12</td><td>WAP to create a thread that implements the Runnable interface.</td><td></td></tr>
</table>

# SCHOOL OF POLYTECHNIC

## OPERATING SYSTEMS LAB

(SPD01230454)

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Demonstration of all the controls provided in windows control panel. | |
| 2 | Exercise on Basics of windows. | |
| 3 | Installation of Linux Operating System. | |
| 4 | Usage of directory management commands of Linux: ls, cd, pwd, mkdir, rmdir. | |
| 5 | Usage of File Management commands of Linux: cat, chmod,cp, mv, rm, pg, more, find. | |
| 6 | Use the general purpose commands of Linux: wc, od, lp, cal, date, who, whoami. | |
| 7 | Using the simple filters: pr, head, tail, cut, paste, nl, sort. | |
| 8 | Communication Commands: news, write, talk, mseg, mail, wall. | |
| 9 | Write a shell program that finds the factorial of a number. | |
| 10 | Write a shell program that finds whether a given number is prime or not. | |
| 11 | Write a shell program to find the average of three numbers | |
| 12 | Write a shell program that will convert all the text of the file from lowercase to uppercase. | |

# SCHOOL OF POLYTECHNIC

## INTRODUCTION TO DATA ANALYTICS USING ADVANCED EXCEL LAB

(SPB01230460)

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | **Getting Started with Excel:** Creation of spread sheets, Insertion of rows and columns, Drag & Fill, use of Aggregate functions. | |
| 2 | **Working with Data:** Importing data, Data Entry & Manipulation, Sorting & Filtering. | |
| 3 | **Sheet Security features, lock and unlock cells** | |
| 4 | **Analysis using functions:** sum, average, max, mean, ceiling, round. | |
| 5 | **Data Analysis Process:** Conditional Formatting, Data Tables, Charts & Graphs. | |
| 6 | What-If Analysis, Else-if, countif, sumif. | |
| 7 | **Data Analysis Project**: Create worksheet with following fields: Student Enroll no., Student name, marks of each subject, Total, Percentage, and Conditional formatting (three Red, Yellow, and Green Grade). Use appropriate formulas to calculate the above scenario. Analyse the data using appropriate chart and report the data. | |
| 8 | **Working with Data:** Data Validation, Pivot Tables & Pivot Charts. | |
| 9 | **Cleaning Data with Text Functions:** Use of UPPER and LOWER, TRIM function, Concatenate. | |
| 10 | Practising VLOOKUP, HLOOKUP, XLOOP. | |
| 11 | **Cleaning Data Containing Date and Time Values:** Use of DATEVALUE function, DATEADD and DATEDIF, TIMEVALUE functions. | |
| 12 | **Conditional Formatting:** Formatting, parsing, and highlighting data in spread sheets during data analysis. | |
| 13 | **Working with Multiple Sheets:** Work with multiple sheets within a workbook is crucial for organizing and managing data perform complex calculations and create comprehensive reports. | |
| 14 | **Data Analysis Project**: Create worksheet with following fields: Employee no., Employee name, Basic Pay (BP), Travelling Allowance (TA), Dearness Allowance (DA), House Rent Allowance (HRA), Income Tax (IT), Provident Fund (PF), Net Pay (NP). Use appropriate formulas to calculate the above scenario. Analyse the data using appropriate chart and report the data. | |

| | | |
|---|---|---|
| 15 | **Data Analysis Project**: Create worksheet on Inventory Management: Sheet should contain Product code, Product name, Product type, MRP, Cost after % of discount, Date of purchase. Use appropriate formulas to calculate the above scenario. Analyse the data using appropriate chart and report the data. | |
| 16 | **Data Analysis Project**: Create worksheet on Sales analysis of Merchandise Store: data consisting of Order ID, Customer ID, Gender, age, and date of order, month, online platform, Category of product, size, quantity, amount, shipping city and other details. Use of formula to segregate different categories and perform a comparative study using pivot tables and different sort of charts | |
| 17 | Generation of report & presentation using Auto filter & macro. | |

# Semester 5th

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction to Internet Of Things (IoT)** **08 Periods**

1.1 Introduction to IoT, Defining IoT, Things in IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, IoT Protocols, IoT communication Models, IoT communication API's, IoT enabling Technologies.

**UNIT 2: IoT Devices** **10 Periods**

2.1 How electronic devices fit with the Internet of Things, and why they are important: Breadboard and its internal connections, LED and its connections, Tri-colour, LED, Resistor. Introduction to the many 'end devices', sensors and actuators, differentiate between different sensor types

**UNIT 3: IoT Networks** **08 Periods**

3.1 Introduction to the components of basic IoT networks, the types of network connections and how data travels through them, and the role of Internet Protocols. understanding of microcontrollers/Arduino and communication protocols

**UNIT 4: IoT Arduino** **10 Periods**

4.1 Feature of Arduino device, Arduino device introduction, Components of Arduino board , C Arduino Programming Language, Understanding of basic of Arduino IDE, function, control, statement, loops, data type, variables: (Language)

**UNIT 5: IoT and M2M** **06 Periods**

5.1 Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT-Software defined networking, network function virtualization, IoT and WoT.

## TEXT BOOKS


1. **Internet of Things** by Priyam Tayal, Asian Publishers, Muzaffarnagar.
2. **Internet of Things** by Rashmi, Sachin; Jai Prakash Nath Publications, Meerut.


## REFERENCE BOOKS


1. **The Internet of Things: Connecting Objects to the Web,** Wiley Publisher Hakima Chaouchi
2. **21 Internet Of Things (IOT) Experiments,** BPB Publications YashavantKanetka.
3. **Internet of Things: A Hand on Approach,** University Press, Vijay Madisetti, Arshdeep Bahga.
4. **The Internet of Things**, Pearson, By Michael Miller ISBN: 9789332552456.


## SCHOOL OF POLYTECHNIC

## SOFTWARE ENGINEERING

(SPB01230502)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 6: Introduction to Software Engineering** **08 Periods**

1.1 System Concepts: Types of systems: (open, closed, static and dynamic systems).
Introduction, Programmes v/s Software Products

1.2 Emergence of Software Engineering- Early Computer Programming, High-level Language Programming, and Control flow based Design, Data Structure Oriented Design, and Object Oriented Design.

**UNIT 7: Software Life Cycle Models** **10 Periods**

2.1 Requirement of Life Cycle Model, Classic Waterfall Model, Prototyping Model, Evolutionary Model, Spiral Model, introduction to agile methodology.
Comparison of different Life Cycle Models

**UNIT 8: Software Planning, Requirement Analysis and Specification** **12 Periods**

3.1 Software Planning: Responsibilities of Software Project Manager.
- Metrics for Project Size Estimation- LOC(Lines of Code), Function Point Metric
- Project estimation Techniques- Using COCOMO Model

3.2 Requirement Analysis and Specification: Requirement gathering and Analysis, Software Requirement Specifications (SRS), Characteristics of good SRS.

**UNIT 9: Software Design and Implementation** **06 Periods**

4.1 Characteristics and features of good Software Design Cohesion and Cupling, Software design Approaches- Function Oriented Design (Data flow diagrams, Data dictionary, Decision Trees and tables), Object Oriented Design, Structured Coding Techniques, Coding Styles, and documentation

**UNIT 10: Software Testing** **06 Periods**

5.1 Concept of Testing, Testing type cycle (V-Model), Verification v/s Validations, Unit Testing, Black Box Testing, White Box Testing, Integration testing, System testing, Configuration management, Overview of test cases.

## TEXT BOOKS


1. **Software Engineering** by Satish Kumar Gupta, Jai Prakash Nath Publications, Meerut.
2. **Software Engineering** by Priyam Tayal, Asian Publishers, Muzaffarnagar.


## REFERENCE BOOKS


1. **Software Engineering** by Rajib Mall, PHI Publishers, New Delhi.
2. **Software Engineering – A Practitioner's Approach** by RS Pressman, Tata McGraw Hill Publishers, New Delhi.
3. **Software Engineering** by KK Aggarwal and Yogesh Singh. Software Engineering, Sangeeta Sabharwal, New Age International, Delhi.

| 3 | 0 | 0 |
|---|---|---|

## DETAILED CONTENTS

**UNIT 1: PHP Introduction** **14 Periods**

1.1 Introduction to PHP: How PHP Works, the php.ini File, Basic PHP Syntax, PHP variables, statements, operators, decision making, loops, arrays, strings, PHP OOPs concept, PHP forms (form handling, validation), get and post methods, functions.

1.2 Introduction to cookies, storage of cookies at client side, using information of cookies, Creating single or multiple server-side sessions, Timeout in sessions.

**UNIT 2: PHP and MySQL** **08 Periods**

2.1 Introduction to MySQL, connecting to MySQL, database, creation, insertion, deletion and retrieval of MySQL data using PHP.

**UNIT 3: AJAX** **06 Periods**

3.1 AJAX Introduction, XML Http, Request object, server response, AJAX events, Validation, Interaction with API

**UNIT 4: Word Press (CMS)** **10 Periods**

4.1 Basics: Introduction to content management systems based on PHP, Introduction to Word Press, How Word Press Works, Installation of Word Press

4.2 Posts & Pages: Introduction to Blogging, Creating Blogs, Using Images, Wrapping Text Around Images, Comments, Post Formats, Linking to Posts, Pages, and Categories, Using Smilies, Links Manager, WordPress Feeds, Using Password Protection.

**UNIT 5: Customizing Site Appearance and Themes in Word Press** **10 Periods**

5.1 Developing a Colour Scheme, Designing Headers, CSS Horizontal Menus, Dynamic Menu Highlighting, Navigation Links, Next and Previous Links, Styling for Print, Designing Your Post Meta Data Section, Separating Categories in your Post Meta Data Section, Customizing the Read More, Formatting Date and Time, Finding CSS Styles, Creating Individual Pages, Uploading Files using WordPress Themes, Templates, Template Tags, Template Hierarchy, validating a Website, Know Your Sources, WordPress Site Maintenance

## TEXT BOOKS


1. **Web Development using PHP,** by Priyam Tayal and Manish Sahoo; Asian Publishers, Mujaffarnagar.
2. **Web Development Using PHP,** by Bajpai and Sharma; Jai Prakash Nath Publications


## REFERENCE BOOKS


1. **Head First PHP & MySQL, O'Reilly Media,** Inc, Michael Morrison, Lynn Beighley.
2. **Sams Teach Yourself PHP, MySQL, and Apache All in One"** by Julie C. Meloni, Publisher: SAMS, ISBN 0-672-32976-X.
3. **Web enabled development application by Ivan Byross:** Commercial; TMH.
4. **PHP: The Complete Reference**, by Steven HolznerMcgraw Higher Ed.



## SCHOOL OF POLYTECHNIC

### PYTHON PROGRAMMING

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction and Basic Python Syntax** **08 Periods**

1.1 Introduction: Brief History of Python, Python Versions, Installing Python, Environment Variables, Executing Python from the Command Line, IDLE, Editing Python Files, Python Documentation, Getting Help, Dynamic Types, Python Reserved Words, Naming Conventions

1.2 Basic Python Syntax: Basic Syntax, Comments, String Values, String Methods, The format Method, String Operators, Numeric Data Types, Conversion Functions, Simple Output, Simple Input, The % Method, The print Function

**UNIT 2: Language Components and Collections** **12 Periods**

2.1 Language Components: Indenting Requirements, if Statement, Relational and Logical Operators, Bit Wise Operators, The while Loop, break and continue, for Loop.

2.2 Collections: Introduction, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections , Summary

**UNIT 3: Functions, Modules and Exceptions** **12 Periods**

3.1 Functions: Introduction, Defining Your Own Functions, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope, Functions - "First Class Citizens", Passing Functions to a Function, map, filter, Mapping Functions in a Dictionary, Lambda, Inner Functions, Closures

3.2 Modules: Standard Modules – sys, Standard Modules – math, Standard Modules - time, The dir Function.

3.3 Exceptions: Errors, Runtime Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, Raise, assert.

**UNIT 4: Python File Operations** **04 Periods**

4.1 Access Modes, Writing Data to a File, Reading Data From a File, Additional File Methods

**UNIT 5: Classes in Python** **06 Periods**

5.1 Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, File Organization, Special Methods, Class Variables, Inheritance, Polymorphism

## TEXT BOOKS

1. **Computer Programming Using Python** by Nikhil Singh, Jai Prakash Nath Publications.
2. **Computer Programming Using Python** by Priyam Tayal, Asian Publishers, Mujaffarnagar.

## REFERENCE BOOKS

1. **Learning Python by Mark Lutz;** Pratham Books, Bangalore. **Foundations of Python Network Programming** by John Goerzen and BrandeuRhodes; Apress-eBook distributed by Springer Science and Business Media, New York.

# Computer Architecture and Hardware Maintenance

(SPB01230505)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Hardware Organisation of computer system** **08 Periods**

1.1 CPU organisation: general register organisation, stack organisation, instruction formats (three address, two address, one address, zero address and RISC instruction). Addressing modes: Immediate, register, direct, in direct, relative, indexed.

1.2 CPU Design: Microprogrammed vs hard wired control.

1.3 Reduced instruction set computers: CISC characteristics, RISC characteristics, and their comparison.

**UNIT 2: Memory organisation** **08 Periods**

2.1 Memory Hierarchy, RAM and ROM chips, Memory address map, Memory connections to CPU, Auxiliary memory: Magnetic disks and magnetic tapes, Associative memory, Cache memory, Virtual memory, Memory management hardware, Read and Write operation

**UNIT 3: Arithmetic Operations** **08 Periods**

3.1 Introduction, Addition, Subtraction, Multiplication and Division algorithm.

**UNIT 4: I/O Organization** **08 Periods**

4.1 Basis Input output system(BIOS): Function of BIOS, Testing and initialization, Configuring the system

4.2 Modes of Data Transfer, Programmed I/O: Synchronous, asynchronous and interrupt initiated, DMA data transfer

**UNIT 5: 8085 Microprocessor and Architecture of multi-processor systems** **10 Periods**

5.1 8085 Microprocessor: Introduction, Architecture, Pin diagram, Comparison with 8086.

5.2 Architecture of multi-processor systems: Forms of parallel processing, Parallel processing and pipelines, basic characteristics of multiprocessor, General purpose multiprocessors, Interconnection networks: time shared common bus, multi-port memory, cross bar switch, multi stage switching networks and hyper cube structures.

## TEXT BOOKS

1. **Computer Architectural & Hardware Maintenance** by Priyam Tayal, Asian Publishers, Muzaffarnagar.
2. **Computer Architecture and Hardware Maintenance** by Mayank Arya, Jai Prakash Nath Publications, Meerut.

## REFERENCE BOOKS

1. **Computer Architecture and Organisation** by Moris Mano.

2. **Computer Architecture** by J.P.Hayes.
3. **Structured Computer Organisation** by Tanenbaum Andrew S, PHI.

## INTERNET OF THINGS LAB

## (SPB01230551)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Installation of Arduino IDE | |
| 2 | Interfacing Light Emitting Diode (LED)- Blinking LED | |
| 3 | Interfacing Button and LED – LED blinking when button is pressed. | |
| 4 | Interfacing Light Dependent Resistor (LDR) and LED, displaying automatic night lamp. | |
| 5 | Interfacing Temperature Sensor (LM35) and/or humidity sensor (e.g. DHT11). | |
| 6 | Interfacing Liquid Crystal Display (LCD) – display data generated by sensor on LCD. | |
| 7 | Interfacing Air Quality Sensor-pollution (e.g. MQ135) - display data on LCD, switch on LED when data sensed is higher than specified value. | |
| 8 | Interfacing Bluetooth module (e.g. HC05) - receiving data from mobile phone on Arduino and display on LCD. | |
| 9 | Interfacing Relay module to demonstrate Bluetooth based home automation application (using Bluetooth and relay). | |

# SCHOOL OF POLYTECHNIC

## WEB DEVELOPMENT USING PHP LAB

(SPB01230553)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Design PHP based web pages using correct PHP, CSS, and XHTML syntax, structure. | |
| 2 | Create Web forms and pages that properly use HTTP GET and POST protocol as appropriate. | |
| 3 | Design SQL language within MySQL and PHP to access and manipulate databases. | |
| 4 | Install and configure both PHP and MySQL. | |
| 5 | Create PHP code that utilizes the commonly used API library functions built in to PHP. | |
| 6 | Design and create a complete web site that demonstrates good PHP/MySQL client/server design using Ajax. | |
| 7 | Write a PHP program to store a cookie using PHP on client side. | |
| 8 | Write a PHP program to save the user session on server side. | |
| 9 | Design a website using Word Press. | |
| 10 | Creation of basic Blogging website using Word Press. | |

# SCHOOL OF POLYTECHNIC

## PYTHON PROGRAMMING LAB

## (SPB01230554)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Write a python program to add two numbers in python IDLE in interactive and batch mode. | |
| 2 | Write a python program to demonstrate the use of lower, count, and replace string methods. | |
| 3 | Write instructions in python to perform each of the steps below :<br>(a) Create a string containing at least five words and store it in a variable.<br>(b) Print out the string.<br>(c) Convert the string to a list of words using the string split method.<br>(d) Sort the list into reverse alphabetical order using some of the list methods (you might need to use dir (list) or help (list) to find appropriate methods).<br>(e) Print out the sorted, reversed list of words. | |
| 4 | Write a program that determines whether the number is prime. | |
| 5 | Write a python program to find all numbers which are multiple of 17, but not the multiple of 5, between 2000 and 2500? | |
| 6 | Write a python program to swap two integer numbers using a temporary variable. Repeat the exercise using the code format: a, b = b, a. Verify your results in both the cases. | |
| 7 | Write a python program to find the largest of n numbers, using a user defined function largest (). | |
| 8 | Write a function my Reverse () in python which receives a string as an input and returns the reverse of the string. | |
| 9 | Write a python program to check if a given string is palindrome or not. | |
| 10 | Write a python program to convert Celsius to Fahrenheit. | |
| 11 | Write a python program to find the ASCII value of charades. | |
| 12 | Create a simple calculator using python. | |

# SCHOOL OF POLYTECHNIC

## COMPUTER ARCHITECTURE AND HARDWARE MAINTENANCE LAB
## (SPB01230555)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Demonstration of following:<br>(i) motherboard<br>(ii) Key board & Keyboard decoder<br>(iii) Video Adapter & display controllers<br>(iv) Floppy Drive, CD Drive and Hard Disk.<br>(v) Multifunction Input/Output controllers<br>(vi) Assembly of PC | |
| 2 | Troubleshooting & repair of following equipment:<br>(i) Dot Matrix Printer, Laser, Inkjet Printer.<br>(ii) Digital Plotter<br>(iii) C. P. U.<br>(iv) Disk Drive | |
| 3 | Trouble Shooting of<br>(i) Network<br>(ii) Power Supplies. | |

# Semester 6th

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction to Android, Environment Setup and Basic Project Structure** **12 Periods**

1.15 Introduction: What is Android? Dalvik Virtual Machine & .apk file extension, Fundamentals: Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications, Components for communication -Intents & Intent Filters, Android API levels (versions & version names).

1.16 Setting up development environment Android, Manifest.xml, Gradle, Uses-permission & uses-sdk, Resources & R.java, Assets, Layouts & Drawable Resources, First sample Application, Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to DDMS, Hello World App, Creating your first project The manifest file Layout resource, Running your app on Emulator, Debugging the Android App.

**UNIT 2: Android Fundaments and User Interface Design** **08 Periods**

2.1 Activities and Activity lifecycle, Permission System.

2.2 Basic UI Components: Text View, Button, Radio Button , Edit Text, Image View for image, Check Box , Progress Bar, Event Handling in Android

2.3 Layouts: Liner Layout, Relative Layout, Frame Layout, Coordinate Layout, [dip, dp, sip, sp] versus px.

2.4 Intents: Intents introduction and importance, Types of Intents (Explicit Intents, Implicit intents).

**UNIT 3: Menus, Preferences and Advanced UI Components** **08 Periods**

3.1 Introduction to Menus, Types of Menus (Option menu, Context menu), Uses of Shared Preferences.

3.2 Time and Date, List View, Grid View, Card View, recycler view Adaptors (Base Adaptor, Array Adaptor) & View Holder, Dialogs, Toast, Popup, Fragments, Material Design(Introduction , Navigation, Floating Button , Tool bar).

**UNIT 4: Threads, Notifications and Services in Android** **08 Periods**

4.1 Threads running on UI thread (run on UI Thread), Worker thread, Handlers & Runnable, AsynTask, calling web services and consuming JSON data from Web Services.

4.2 Broadcast Receivers (Introduction, different ways to register a broadcast receiver), Introduction to Notification, Overview & Types of services, implementing a Service, Service lifecycle.

**UNIT 5: Storage and Content Provider** **06 Periods**

5.1 Supported Storage in Android (Internal memory, External memory, Shared Preferences and network), SQLite introduction, CRUD Operations in SQLite database (cursor, content values etc), Basics of Content Provider.

## TEXT BOOKS

1. **Development of Android Applications** by Sharma, Yadav, and Arya; Jai Prakash Nath Publications, Meerut.
2. **Development of Android Applications** by Priyam Tayal, Asian Publication, Muzaffarnagar.

## REFERENCE BOOKS

1. **Beginning Android 4 Application Development** by Wei-Meng Lee; Wiley India**.**
2. **Android Apps for Absolute Beginners** by Jackson; Apress**.**
3. **Head First Android Development: A Brain-Friendly Guide,** by David Griffiths and Dawn Griffiths, O`Relilly.

## SCHOOL OF POLYTECHNIC

# CLOUD COMPUTING

(SPB01230602)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| **UNIT 1:** | **Introduction** | **10 Periods** |
| 1.1 | Introduction: Evolution of Cloud Computing, Cloud Computing Overview, Characteristics, Applications, Benefits, Challenges, Major Cloud Service Providers. | |
| 1.2 | Cloud Computing Service Models: Infrastructure as a Service, Platform as a Service, Software as a Service. | |
| 1.3 | Cloud Computing Deployment Models: Private Cloud; Public Cloud, Community Cloud, Hybrid Cloud. | |
| **UNIT 2:** | **Service Level Agreement (SLA) Management** | **08 Periods** |
| 2.1 | Overview of SLA, Types of SLA, SLA Life Cycle, SLA Management Process. | |
| **UNIT 3:** | **Virtualization Concepts** | **08 Periods** |
| 3.1 | Overview of Virtualization, Types of Virtualization, Benefits of Virtualization, Hypervisors. | |
| **UNIT 4:** | **Cloud Security and Storage** | **10 Periods** |
| 4.1 | Cloud Security: Infrastructure Security, Data Security & Privacy Issues, Legal Issues in Cloud Computing. | |
| 4.2 | Cloud Storage: Overview; Storage as a Service, Benefits and Challenges, Storage Area Networks (SANs). | |
| **UNIT 5:** | **Scheduling in Cloud** | **06 Periods** |
| 5.1 | Overview of Scheduling problem, Different types of scheduling, Scheduling for independent and dependent tasks, Static vs. Dynamic scheduling. | |

## TEXT BOOKS

1. **Cloud Computing** by Dr. Ashutosh Sharma, Monika Sharma, Jai Prakash Nath Publications, Meerut.

## REFERENCE BOOKS


1. Rajkumar Buyya, James Broberg, Andrzej Goscinski (Editors): **Cloud Computing: Principles and Paradigms,** Wiley, 2011.
2. Barrie Sosinsky: **Cloud Computing Bible**, Wiley, 2011.
3. Kumar Saurabh, **Cloud Computing,** Wiley, 2012.
4. Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper: **Cloud Computing for Dummies,** Wiley, 2010.

# SCHOOL OF POLYTECHNIC

## ELECTIVE - DOT NET TECHNOLOGIES

(SPB01230603)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Net Framework** **10 Periods**

1.1 Introduction, common language routine, common types system, common language specification, the base class library, the .net class library, Intermediate language. Justin-time compilation and assemblies, Introduction to web services, unified classes.

**UNIT 2: C# Basics** **08Periods**

2.1 Getting started with .net framework, exploring visual studio.net, Inside a C# program, data types, statements, arrays, using strings, objects, classes, struts, events, namespaces and important partial classes.

2.2 Advance Feature of C#: Collection and data structure, exception handling, Threading using stream and files, assemblies.

**UNIT 3: ADO.net** **08 Periods**

3.1 Introduction to ADO.net, ADO.net benefits, ADO.net compared to classic ADO datasets, managed providers- data binding; Introducing data source controls-reading and write data using the Sql data source control.

**UNIT 4: ASP.net** **10 Periods**

4.1 Introduction to ASP.net, Working with web and HTML controls, using Rich sever controls, login controls, overview of ASP.net validation control using simple validations, using the complex validators, accessing data using ADO.net.

**UNIT 5: ASP.net 6.0** **06 Periods**

5.1 Features of ASP.net 6.0, stages in web form processing, Introduction to server controls, data binding controls, session state, ADO.net, database

## TEXT BOOKS

1. **.NET Technologies** by Priyam Tayal, Jyoti Sarvariya, Asian Publishers, Muzaffarnagar.

## REFERENCE BOOKS

1. Christan Nagel, **Professional C#.net,** Publication.
2. Mathew Macdonald and Robert Standefer, **ASP.net complete reference,** TMH.
3. Vijay Mukhi, **C# the Basis,** BPB Publications.

# SCHOOL OF POLYTECHNIC

## ELECTIVE - DATA SCIENCE USING ML

(SPB01230604)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction of Data Science and Machine Learning** **06 Periods**

1.1 Fundamentals of Artificial Intelligence, need and applications of Data Science, Data Mining, data preparation, Machine Learning, Types and Applications of Machine learning.

**UNIT 2: Data Pre-processing, Analysis and Visualization** **10 Periods**

2.1 Data Pre-processing: Pre-processing Techniques- Mean Removal, Scaling, Normalization, Binarization, One Hot Encoding, Label encoding, Data Analyses: Loading and summarizing the dataset, Data Visualization: Univariate Plots, Multivariate Plots, Training Data, Test Data, Performance Measures

2.2 Training Data, Test Data, Performance Measures.

**UNIT 3: Statistical Inference** **08 Periods**

3.1 Populations and samples, Types of Statistical modelling, Types of probability distributions. Parametric and Non-Parametric Methods, Distance Metrics.

3.2 Exploratory Data Analysis and the Data Science Process: Basic tools (plots, graphs and summary statistics) of EDA, Philosophy of EDA, The Data Science Process.

**UNIT 4: Machine Learning Algorithms** **10 Periods**

4.1 Introduction to Supervised Learning Algorithms –Decision Tree, Linear Regression, k Nearest Neighbours (k-NN), SVM and Introduction to Unsupervised Learning Algorithms - K-means Clustering, Mean Shift Algorithm, Dimensionality Reduction Techniques, Introduction to Neural Networks,

**UNIT 5: Mining Social-Network Graphs** **08 Periods**

5.1 Social networks as graphs, Clustering of graphs, Direct discovery of communities in graphs, Partitioning of graphs, Neighbourhood properties in graphs.

5.2 Data Science and Ethical Issues**:** Discussions on privacy, security, ethics, A look back at Data Science, Next-generation data scientists.

## SCHOOL OF POLYTECHNIC

### ELECTIVE- ADVANCED JAVA

(SPB01230605)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction Server-Side Platform** **10 Periods**

1.1 Introduction to Web Applications, Dynamic websites, Three Layer Architecture of Web Application, Client Server Architecture, IP Address, Port, URL. Web Server, Introduction to Tomcat Web Server (Installation and its Services), Introduction to J2EE

**UNIT 2: Database Programming using JDBC** **08 Periods**

2.1 Introduction to JDBC, JDBC Drivers & Architecture, JDBC API CURD operation Using JDBC API

2.2 Database Connection, JDBC Statement, Prepared Statements (Advantages and Disadvantages), Using Result Sets

**UNIT 3: Java Servlets** **10 Periods**

3.1 Servlet introduction, working of servlet, advantage of servlet, servlet terminology, Servlet Container, Life cycle of a servlet, introduction to servlet API, Servlet interface, Generics Servlet class, Http servlet class, Request Dispatcher (include() and forward).

**UNIT 4: Handling Sessions in Servlets & JSP** **10 Periods**

4.1 Introduction to Session, Session Tracking mechanism: URL rewriting, Hidden form fields, Cookies and Http Session (Working, Advantages and Disadvantages of all session tracking mechanism)

4.2 Introduction to JSP - Architecture, JSP- Life cycle, JSP-syntax, JSP-Directive, JSP Actions, JSP- Implicit objects, JSP - Client request, JSP - Server response, JSP integration with database, JSP Session

**UNIT 5: AJAX** **06 Periods**

5.1 AJAX Introduction, XML Http, Request object, server response, AJAX events, Validation, Interaction with API

## TEXT BOOKS

1. **Advanced Java** by Priyam Tayal, Asian Publishers, Muzaffarnagar

## REFERENCE BOOKS

1. **Head First Servlets And JSP**, Bert Bates, O' Reilly**.**
2. **Java Server Programming Java EE 7 (J2EE 1.7**), Black Book, Kogent Learning Solutions Inc.
3. **Jdbc, Servlets, and Jsp Black Book,** Santosh Kumar KDT Editorial Services, Wiley.
4. **J2EE: The Complete Reference**, Jim Keogh, McGraw Hill Education.

# SCHOOL OF POLYTECHNIC

## INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

(SPB01230606)

| L | T | P |
|---|---|---|
| 3 | 0 | 0 |

## DETAILED CONTENTS

**UNIT 1: Introduction** **08 Periods**

1.1 Concept /Meaning and its need

1.2 Qualities and functions of entrepreneur and barriers in entrepreneurship

1.3 Sole proprietorship and partnership forms and other forms of business organisations, Schemes of assistance by entrepreneurial support agencies at National, State, District –level, organisation: NSIC, NRDC, DC, MSME, SIDBI, NABARD, NIESBUD, HARDICON Ltd., Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks

**UNIT 2: Market Survey and Opportunity Identification/Ideation** **6 Periods**

2.1 Scanning of the business environment, Salient features of National and Haryana State industrial policies and resultant business opportunities, Types and conduct of market survey, Identifying business opportunity, Converting an idea into a business opportunity.

**UNIT 3: Introduction to Management** **10 Periods**

3.1 Definitions and importance of management, Functions of management: Importance and process of planning, organising, staffing, directing and controlling, Principles of management (Henri Fayol, F.W. Taylor), Types of industrial organisations and their advantages, Functional Organisation, Line organisation, staff organisation, Line and staff organisation.

**UNIT 4: Leadership & Motivation, Management Scope in Different Areas** **10 Periods**

4.1 Leadership: Definition and Need, Qualities and functions of a leader, Manager Vs leader, Types of leadership, Case studies of great leaders

Motivation: Definition and characteristics, Importance of self-motivation, Factors affecting motivation, Theories of motivation (Maslow, Herzberg, Douglas, McGregor)

4.2 Human Resource Management: Introduction and objective, Introduction to Man power planning, recruitment and selection, Introduction to performance appraisal methods, Material and Store Management: Introduction functions, and objectives, ABC Analysis and EOQ, Marketing and sales: Introduction, importance, and its functions, Physical distribution, Introduction to promotion mix, Sales promotion, Financial Management: Introductions, importance and its functions, knowledge of income tax, sales tax, excise duty, custom duty, VAT, GST

**UNIT 5: Work Culture, Basic of Accounting and Finance** **08 Periods**

5.1 Introduction and importance of Healthy Work Culture in organization, Components of Culture, Importance of attitude, values and behaviour, Behavioural Science – Individual and group behaviour, Professional ethics – Concept and need of Professional Ethics and human values

5.2 Basic of Accounting: Meaning and definition of accounting, Double entry system of book keeping, Trading account, PLA account and balance sheet of a company

5.3 Objectives of Financial Management: Profit Maximization v/s Wealth

Maximization.

## TEXT BOOKS

1. **Industrial Management and Entrepreneurship Development** by Aggarwal, Aggarwal; Asian Publications, Muzaffarnagar.

## REFERENCE BOOKS

1. **A Handbook of Entrepreneurship**, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana).
2. **Entrepreneurship Development and Management** by J.S.Narang; Dhanpat Rai & Sons, Delhi.
3. **Entrepreneurship Development** by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi.
4. **Entrepreneurship Development and Management** by MK Garg**.**

## SCHOOL OF POLYTECHNIC

### DEVELOPMENT OF ANDROID APPLICATIONS LAB

(SPB01230651)

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Install the Android Studio and Setup the Development Environment. | |
| 2 | Write a program to demonstrate activity (Application Life Cycle). | |
| 3 | Write a program to demonstrate different types of layouts. | |
| 4 | Write a program to implement simple calculator using text view, edit view, option button and button. | |
| 5 | Write a program to develop app having multiple activities and user should be able switch between the activities by using intents. | |
| 6 | Write a program to demonstrate list view. | |
| 7 | Write a program to demonstrate photo gallery. | |
| 8 | Write a program to demonstrate Date picker and time picker. | |
| 9 | Develop a simple application with context menu and option menu. | |
| 10 | Write a program to demonstrate the functionality of Shared Preferences. | |
| 11 | Develop a sample Android application having navigation items similar to Gmail Application. | |
| 12 | Write a program to demonstrate a service. | |
| 13 | Write a program to demonstrate the application of intent class. | |
| 14 | Write a program to create a text file in external memory. | |
| 15 | Write a program to store and fetch data from SQL life database. | |

## CLOUD COMPUTING LAB

(SPB01230651)

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Introduction to Cloud Vendors: Amazon, Microsoft, IBM. | |
| 2 | Setting up Virtualization using Virtual box/VMware Hypervisor. | |
| 3 | Introduction to Own Cloud. | |
| 4 | Installation and configuration of Own Cloud software for SaaS. | |
| 5 | Accessing Microsoft AZURE cloud-services. | |
| 6 | Cloud Simulation Software Introduction: Clouds. | |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Write a program to check whether empty query string is entered in Asp.net. | |
| 2 | Write a program to change colour or Label text control programmatically in Asp. Net. | |
| 3 | Write a program to Enable-Disable Textbox and change width of Text Box programmatically in Asp.net. | |
| 4 | Write a program to increase and decrease font size programmatically. | |
| 5 | Write C# code to display the asterisk pattern as shown below:<br>*****<br>*****<br>*****<br>*****<br>***** | |
| 6 | Write C# code to prompt a user to input his/her name and country name and then the output will be shown as an example below:<br>Hello Ram from country India! | |
| 7 | Write C# code to do the following -<br>-Convert binary to decimal<br>-Convert decimal to hexadecimal<br>-Convert decimal to octal<br>-Convert decimal to binary | |
| 8 | Write a C# code to perform Celsius to Fahrenheit Conversion and Fahrenheit to Celsius conversion. | |
| 9 | Write ASP. Net program to store objects in Session State and Storing Session State in SQL Server. | |

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | WAP to implement the Decision Tree Algorithm. | |
| 2 | WAP to implement the Linear Regression. | |
| 3 | WAP to implement the k-Nearest Neighbors (k-NN). | |
| 4 | WAP to implement the SVM Algorithm. | |
| 5 | WAP to implement the K-means Clustering. | |
| 6 | WAP to implement various Distance Metrics. | |
| 7 | WAP to implement Dimensionality Reduction Techniques. | |

(SPB01230655)

| L | T | P |
|---|---|---|
| 0 | 0 | 4 |

## DETAILED CONTENTS

| | | |
|---|---|---|
| 1 | Exercises related to make JDBC connections and CRUD operations on database by using JDBC APIs. | |
| 2 | Installation and configuration of Web Server Tomcat. | |
| 3 | Exercises related to Java Servlets. | |
| 4 | Exercises related to JSP. | |
| 5 | Exercises related to AJAX. | |
| 6 | Exercises related to Session and Cookies. | |