

B.Sc.,  
Computer Science

# PROFESSIONAL ETHICS

## CORE COURSE I PROGRAMMING IN C AND DATA STRUCTURES (Theory)

**First Year**  
**Code: 22SCCCS1**

**Semester - I**  
**Credit: 5**

### **Objectives:**

- To know about the basics of C Programming, Control and Looping Structures and programming with it.
- To understand Arrays, Pointers and String Processing in C language.
- To know about the basic concepts in Data Structures.

### **UNIT-I:**

Basic of C: History of C and its importance—Structure of a C program – Data Types – Constants and Variables – Operators and Expressions – Order of Precedence, Evaluating of Arithmetic Expressions – Type Conversion- Decision Statements: if, if-else, and nested if statements.

### **UNIT-II:**

Loops Structures: For Loop, While, Do-while loop—Arrays: - One Dimensional Array, Two-dimensional Arrays, Character Arrays and Strings – Functions: Function with arrays – Function with decision and looping statements - Recursion.

### **UNIT-III:**

Pointers: Introduction – Pointer Expressions – Chain of Pointers—Pointers and Arrays –Array of Pointers – Pointers as function arguments – Functions returning Pointers – Pointers to Functions – Function pointer – Structures - declaration, initialization, Array of Structures – Pointer to structures, Structures and functions – Typed of Enumerated data types, Unions.

### **UNIT-IV:**

Strings Processing, Standard string library functions—Files: introduction and files functions—Writing and reading in Text mode – Simple application: Display the contents of a file. Write data to a file. Append data to an existing file – File IO— Reading and writing structures.

## **UNIT-V:**

Stack: LIFO concept, Stack operations, Array implementation of stack– Queue: FIFO concept, Queue operations, Array implementation of queue – Singly Linked List: concepts, operations – Doubly Linked List: concepts, operations – Trees: General trees, Binary trees.

## **UNIT VI:**

**CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **Reference Books:**

1. E. Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, New Delhi, Seventh Edition, 2016.
2. E.Horowitz, S.Sahni and Susan Anderson Freed, “Fundamental Data Structures in C”, 2ed, Orient BlackSwan Publisher, 2009.
3. Byron S. Gottfried, “Programming with C”, Schaum’s Outline Series, Tata- McGraw Hill Edition, New Delhi, 1991.
4. E.Karthikeyan, “A Textbook on C Fundamentals, Data Structures and Problem Solving”,Prentice-Hall of India Private Limited, New Delhi, 2008.
5. YashavantKanetkar, “Let us C”, BPB Publications, Tenth Edition, New Delhi, 2010.
6. Szuhay, Jeff, and Szuhay, Jeff, “Learn C Programming: A Beginner's Guide to Learning C Programming the Easy and DisciplinedWay”, PacktPublishing, 2020.
7. Jena, Sisir Kumar, and Jena, Sisir Kumar, “C Programming: Learn to Code”, CRC Press, 2021.
8. <https://www.tutorialspoint.com/cprogramming/index.htm>
9. <https://www.w3schools.in/data-structures/intro>

### **Course Outcomes:**

Upon successful completion of this course the students would be able to:

- Summarize the basic knowledge to develop C programs
- Manipulate Looping, arrays and functions
- Apply and write programs for solving real world problems
- Create open, read, manipulate,write and close files.
- Understand the basic concepts in data structures.

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# PROFESSIONAL ETHICS

## CORE PRACTICAL I PROGRAMMING IN C LAB (Practical)

**First Year**  
**Code: 22SCCCS1P**

**Semester I**  
**Credit: 4**

### Course Objectives:

- To understand the programming fundamentals of C language.
  - To impart writing skill of C programming and data structures for a list of problems.
  - To impart hands-on training for writing a C program using computers.
1. Write a Program
    - (i) To convert temperature from degree Centigrade to Fahrenheit,
    - (ii) Find whether given number is Even or Odd,
    - (iii) Find the greatest of Three numbers.
  2. Write a Program to display Monday to Sunday using switch statement
  3. Write a Program to display first Ten Natural Numbers and their sum.
  4. Write a Program to perform Multiplication of Two Matrices.
  5. Write a Program
    - (i) To find the maximum number in an Array using pointer.
    - (ii) To reverse a number using pointer.
    - (iii) To add two numbers using pointer.
  6. Write a Program to solve Quadratic Equation using functions.
  7. Write a Program to find factorial of a number using Recursion.
  8. Write a Program to demonstrate Call by Value and Call by Reference.
  9. Write a Program to create a file containing Student Details.
  10. Write a program to implement a stack using singly linked list, Implement Queue using Linked List.

Upon successful completion of this course the students would be able to:

- Relate the use of language constructs to solve programs
- Develop programs for various concepts in C language
- Understand and trace the execution of the list of programs
- Understand the usage of file handling in C programming
- Solve data problems related to Data structures.

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**PROFESSIONAL ETHICS**  
**ALLIED COURSE I**  
**ALGEBRA AND CALCULUS**

**First Year**

**Semester I**

**Code: 22SCCACMM2A**

**Credit: 4**

**Course Objectives:**

- To train the students to solve the problems in theory of equations
- To provide knowledge about the matrix, differentiation and various methods for evaluation of integrals.

**UNIT–I:**

Theory of Equations: Relation between roots & coefficients – Transformations of Equations – Diminishing, Increasing & multiplying the roots by a constant - Forming equations with the given roots –Rolle’s Theorem, Descarte’s rule of Signs(statement only) – simple problems.

**UNIT–II:**

Matrices : Singular matrices – Inverse of a non-singular matrix using adjoint method - Rank of a Matrix – Consistency - Characteristic equation, Eigen values, Eigen vectors – Cayley Hamilton’s Theorem (proof not needed) – Simple applications only

**UNIT–III:**

Differentiation: Maxima & Minima – Concavity, Convexity – Points of inflexion - Partial differentiation – Euler’s Theorem - Total differential coefficients (proof not needed) – Simple problems only.

**UNIT–IV:**

Integration:Evaluation of integral soft types:

$$1) \int \frac{px+q}{ax^2+bx+c} dx \quad 2) \int \frac{px+q}{\sqrt{ax^2+bx+c}} dx \quad 3) \int \frac{dx}{a+b\cos x} \quad 4) \int \frac{dx}{a+b\sin x}$$

Evaluation using Integration by parts – Properties of definite integrals – Fourier Series in the range(0, 2 $\pi$ )– Odd&Even Functions–Fourier Halfrange Sine & Cosine Series

## UNIT–V:

Differential Equations: Variables Separable–Linear equations–Second order of types

$(aD^2 + bD + c)y = (x)$  where a,b,c are constants and  $F(x)$  is one of the following types

(i)  $e^{Kx}$  (ii)  $\sin(kx)$  or  $\cos(kx)$  (iii)  $x^n$ ,  $n$  being an integer (iv)  $e^{Kx}f(x)$

## UNIT –VI CURRENT CONTOURS(ForContinuousInternalAssessment

### Only):

Derivatives of Implicit and parametric Functions

### References:

1. T.K. Manickavasagam Pillai & others, Algebra, Volume I, S.V Publications, 1985 Revised Edition (Units I, II )
2. S. Narayanan, T.K.Manickavasagam Pillai, Calculus, Vol.II, S. Viswanathan Pvt Limited, 2003. (Units III, IV and V)
3. M.L.Khanna, Differential Calculus, Jaiprakashnathand Co., Meerut-2004.

### Course Out comes:

After completing this course, the students will be able to

- Train the students to solve the problems in theory of equations.
- Apply Cayley Hamilt on theorem for finding the inverse of square matrices.
- Get exposed the basic concepts of differentiation and integration.
- Acquire the knowledge about differential equations.

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## HUMAN VALUES

First Year

**PART-IV**  
**VALUE EDUCATION(Theory)**

Semester - I

Code: 22VACVED

Credit: 2

### Objectives:

- To understand the philosophy of life and values throughT hirukural
- To analyses the components of values education to attain the sense of citizenship
- To understand different types of values towards National Integration and international understanding
- To learn yoga as value education to promote mental and emotional health
- To understand human rights,women rights and other rights to promote peace and harmony

### UNIT I: PHILOSOPHY OF LIFE AND SOCIAL VALUES:

Human Life on Earth (Kural 629) - Purpose of Life (Kural46) – Meaning and Philosophy of Life (Kural 131, 226) - Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural43,981).

### UNIT- II: HUMAN VALUES AND CITIZENSHIP

Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values – Character Formation–Components of Value education - A P J Kalam’s ten points for enlightened citizenship - The role of media in value building

### UNIT- III: VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT:

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood – Professional Values – Knowledge thirst, sincerity in profession, regularity, punctuality and faith - Religious Values: Tolerance, wisdom, character- Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same - National Integration and International Understanding.

#### **UNIT IV: YOGA AND HEALTH:**

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

#### **UNIT V: HUMAN RIGHTS:**

Concept of Human Rights: Indian and international perspectives-Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty and Dignity- Right to equality- Right against exploitation-Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.

#### **UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):**

#### **BOOKS FOR REFERENCES:**

1. Thirukkural with English Translation of Rev. Dr.G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004.
2. Leah Levin, Human Rights, NBT, 1998.
3. V.R.KrishnaIyer, Dialectics and Dynamics of Human Rights in India, Tagore Law Lectures.
4. Yogic Therapy-Swami Kuvalayan and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
5. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedapatti, 1999.
6. Grose.D.N-“A textbook of Value Education’ New Delhi(2005)
7. Gawande.EN – “Value Oriented Education” – Vision for better living. New Delhi (2002) Saruptsons.
8. Brain Trust Aliyar - “Value Education for Health, Happiness and Harmony” Erode (2004) Vethathiri publications.

#### **Course Outcomes:**

After completion of the course, the student will be able to:

- Apply the values in thirukkural to be peaceful, dutiful and responsible in family and society.
- Develop character formation and sense of citizenship.
- Be secular, self-control, sincere, respectful and moral.
- Master yoga, asana and meditation to promote mental health.
- Be attitudinal to follow the constitutional rights.

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## CORE COURSE II PROGRAMMING IN JAVA (Theory)

**First Year**  
**Code: 22SCCCS2**

**Semester - II**  
**Credit: 5**

### Course Objectives:

- To acquire the programming skills with java.
- To implement the object-oriented concepts with java language.
- To learn the art of GUI programming with Applet.

### UNIT-I:

Foundation, Essentials, Control Statement and Classes & Objects, Stage of Java – Origin of Java – challenges - features – Object - Oriented Programming; Java Essentials: Elements - API - variables – primitive data types – String Class - operators – combined assignment operators - conversion – scope – comments - keyboard input; Control Statements: if, if-else, nested if & if-else-if statements – logical operators – comparison – conditional operator – switch – increment and decrement – while, do-while & for loops – nested loops – break and continue; Classes and Objects: classes and objects - modifiers – passing arguments – constructors – package & import – static class members – method overloading – constructor overloading–returning objects – this variable – recursion – nested & inner classes–abstract classes & methods.

### UNIT-II:

Arrays, String Handling, Inheritance, Interface and Packages, Introduction – processing array – passing arrays – returning arrays – String arrays – two Dimensional Arrays – Arrays with Three or More Dimensions; String Handling: String class – concatenation – comparison – substring – methods – other methods – String Buffer, String Builder & String Tokenizer classes; Inheritance: basics – inheriting and overriding superclass methods – calling superclass constructor – polymorphism – inherit from different classes – abstract classes – final Class; Interfaces: Basics–multiple Interfaces – multiple inheritance using interface – multilevel interface – Packages – Create and access packages in Net Beans IDE – static Import and package class – access specifiers.

### **UNIT-III:**

Exception Handling, I/O and File Handling and Multithreading, Introduction - try and catch block – multiple catch block – nested try – finally Block – throw Statement – exception propagation – throw Clause - custom exception – built-in exception; Multi threading: Introduction – threads – thread creation – life cycle – joining a thread – scheduler & priority – synchronization – inter-thread communication – thread control – thread Pool – thread group – daemon thread; Files and I\O Streams: file Class – streams – byte streams – filtered byte streams – Random Access File class – character streams.

### **UNIT-IV:**

Applet and GUI Part I, Fundamentals – applet class – life cycle – steps for applet program – passing values through parameters – graphics – event handling; GUI I: GUI – creating windows – dialog boxes – layout managers – AWT component classes – Swing component classes – applications of AWT controls.

### **UNIT-V:**

GUI Part II and Java Database Connectivity, Event handling – AWT components – AWT graphics classes – Swing controls – application using Swing and AWT; Java Database Connectivity: types of drivers – JDBC architecture – JDBC classes & Interfaces – steps in JDBC applications – Creating a new Database and table with JDBC.

### **UNIT VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. S.Sagayaraj, R.Denis, P.Karthik & D.Gajalakshmi, “Constructive Java Programming”, Universities Press, 2021.
2. E.Balagurusamy, “Programming with JAVA”, Tata McGraw Hill, New Delhi, 2019.
3. C.Muthu, “Programming with JAVA”, Vijay Nicole Imprints Private Limited, Chennai, Second Edition, 2011.
4. Bruce Eckel, Chuck Allison, “Thinking in Java”, Prentice Hall Publications, 2006.
5. Malina Pronto, “Java”: How To Learn Java Programming: How To Improve Your Java Coding In 2020/2021: 5 Programming Languages To Learn For Beginners In Tech", Independently Published, 2020.
6. Nick Samoylov, “Learn Java 12 Programming: A Step-by-Step Guide to Learning Essential Concepts in Java”, Packt Publishing, 2019.
1. <https://www.javatpoint.com/java-tutorial>

## **Course Outcomes:**

Upon successful completion of this course the students would be able to:

- Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
- Identify members of a class and to implement them.
- Create Java application programs using sound OOP practices(e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, and create user define package for specific task, (reusability concepts)error exception handling.
- Develop programs using the Java standard class library.
- Develop software using Java programming language, (usingapplet, AWT controls, and DBC).

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# PROFESSIONAL ETHICS

## CORE PRACTICAL II PROGRAMMING IN JAVA LAB(Practical)

**First Year**  
**Code:22SCCCS2P**

**SEMESTER: II**  
**Credit:4**

### Course Objectives:

- To understand the basics of JAVA programs and their execution.
  - To learn concepts like inheritance, packages and interfaces.
  - To understand the life cycle of the applets, database connectivity and their functionality.
1. Write a program to sort the given numbers using arrays.
  2. Write a program to implement the FIND and REPLACE operations in the given text.
  3. Write a program to implement a calculator to perform basic arithmetic Operations, doing with constructors.
  4. Write a program to find the student's percentage and grade using command line arguments.
  5. Write a program to draw circle or triangle or square using polymorphism and inheritance.
  6. Implement multiple inheritance concepts in java using interface, you can choose your own example of a company or education institution or a general concept which requires the use of interface to solve a particular problem.
  7. Write a program to create threads and perform operations like start, stop, suspend, resume
  8. Write a program to develop an applet to play multiple audio clips using multithreading.
  9. Write a program to retrieve employee data from a file.
  10. Write a program to retrieve student data from a Database.

### Course Outcomes:

Upon successful completion of this course the students would be able to:

- Develop java programs to understand the OOP concepts.
- Write java programs for classes and objects.
- Develop simple programs with multiple threads.
- Write java programs using Applets.
- Develop java programs to connect databases and files.

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## ALLIED COURSE II NUMERICAL ANALYSIS AND PROBABILITY (Theory)

**First Year**

**Semester II**

**Code: 22SCACMM2B**

**Credit: 2**

### **Objectives:**

- To learn knowledge about an algebraic and transcendental equations.
- To make the students gain wide knowledge in probability which plays a main role in solving real life problems.

### **UNIT-I:**

Algebraic & Transcendental equations: Bisection Method, Newton Raphson Method, Iteration method - Finite differences – Forward, Backward differences – Newton's forward & backward difference interpolation formulae – Lagrange's interpolating polynomial.

### **UNIT-II:**

Numerical differentiation - Numerical Integration using Trapezoidal rule and Simpson's first & second rules (proof not needed) - Solutions to Linear Systems – Gaussian Elimination Method–Jacobi&GaussSiedaliterativemethods– Theory and problems.

### **UNIT-III:**

Numerical solution of ODE: Solution by Taylor Series Method, Euler's Method, Runge - Kutta 2nd order method- Adam's Predictor Corrector Method and Milne's Predictor Corrector Methods.

### **UNIT-IV:**

Arithmetic Mean – Geometric Mean – Harmonic Mean - Median, Mode , Standard Deviation - Quartile Deviation – Percentiles - Expectation – Variance and covariance.

### **UNIT-V:**

Correlation and Regression – Properties of Simple Correlation and regression coefficients – Simple Numerical Problems only.

### **UNIT-VI: CURRENT CONTOURS(For Continuous Internal Assessment Only):**

An introduction to MATLAB

**References:**

1. S.S.Sastry, Numerical Analysis(Unit1,2,3).
2. Gupta.S.C & Kapoor, V.K, Fundamentals of Mathematical Statistics, Sultan Chand & sons, New Delhi -1994.(Units 4 & 5).
3. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Private Limited, 1999.
4. C.E. Froberg, Introduction to Numerical Analysis, II Edn., Addison Wesley, 1979.

**Course Outcomes:**

After completing this course, the students will be able to

- Solve algebraic and transcendental equations.
- Appreciate the importance of probability of random variables and understand the correlation and regression coefficients.

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# PROFESSIONAL ETHICS

## ALLIED COURSE III OPERATIONS RESEARCH

First Year  
Code: 22SCACMM2C

Semester II  
Credit: 4

### Course Objectives:

- To learn the basic concepts about Linear Programming Problem, Transportation Problem Assignment Problem, Sequencing Problem and Network.
- To make students solve real life problems in Business and Management.

### UNIT-I:

Operations Research: Introduction - Basics of OR – OR & decision making – Role of Computers in OR – Linear programming formulations & graphical solution of two variables – Canonical & standard forms of LPP

### UNIT- II:

Simplex Method: Simplex Method for  $<, =, >$  constraints – Charne's method of penalties– Two phase Simplex method.

### UNIT- III:

Transportation problem: Transportation algorithm – Degeneracy algorithm – Degeneracy in Transportation Problem, Unbalanced transportation problem - Assignment algorithm – Unbalanced Assignment problem

### UNIT- IV:

Sequencing problem: Processing of n jobs through two machines – Processing of n jobs through 3 machines – processing of two jobs through machines.

### UNIT-V:

Networks: Network – Fulkerson's rule - measure of activity – PERT computation – CPM computation - Resource scheduling.

**UNIT-VI: CURRENT CONTOURS (For Continuous Internal Assessment Only):**  
Integer and Dynamic programming.

### References:

1. Manmohan & Gupta, Operations Research, Sultan Chand Publishers, New Delhi
2. Prem Kumar Gupta and D.S.Hira, Operations Research: An Introduction,
3. S.Chand and Co., Ltd. New Delhi,
4. Hamdy A.Taha, Operations Research (7th Edn.), McMillan Publishing Company, New Delhi, 1982.

## **Course Outcomes:**

After completing this course, the students will be able to

- Acquire the basic concepts of LPP.
- Apply various methods for finding a solution of an LPP.
- Use the basic concepts of TP, AP and Network Problems to develop the problem solving skills.

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# PROFESSIONAL ETHICS

## PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES - I

**First Year**

**Semester II**

**Code: 22PELPSI**

**Credit:4**

### Objectives:

- To develop the language skills of students by offering adequate practice in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
- To focus on developing students' knowledge of domain specific registers and the required language skills.
- To develop strategic competence that will help in efficient communication
- To sharpen students' critical thinking skills and make students culturally aware of the target situation.

### Learning Outcomes:

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar (Outcomes based on guidelines in UGC LOCF – Generic Elective)

### UNIT1: COMMUNICATION

1. **Listening:** Listening to instructions

2. **Speaking:** Telephone etiquette and Official phone conversations

3. **Reading** short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)

5. **Writing:** Letters and Emails in professional context

6. **Grammar in Context:**

- Wh and yes or no,
- Q tags
- Imperatives

7. **Vocabulary in Context:** Word formation-

I. Creating antonyms using Prefixes

ii. Intensifying prefixes (E.g. in flammable) Changing word using suffixes

- Noun Endings
- Adjective Endings
- Verb Endings

## **UNIT2: DESCRIPTION**

**Listening** – Listening to process description

**Speaking** - Roleplay

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication

**Reading** – Reading passages on products, equipment and gadgets

**Writing** – Writing sentence definitions(e.g.computer) and extended definitions(e.g.artificial intelligence)

Picture Description–Description of Natural Phenomena

**Grammar in Context:** Connectives and linkers.

**Vocabulary** – Synonyms (register)- Compare & contrast expressions.

## **UNIT3: NEGOTIATION STRATEGIES**

**Listening** - Listening to interviews of specialists / inventors in fields (Subject specific)

**Speaking** – Brainstorming. (mind mapping). Small group discussions (subject-specific)

**Reading** – longer Reading text. (Comprehensive passages)

**Writing** –Essay Writing (250 word essay on topics related to subject area,like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)

**Grammar inContext:** Active voice & Passive voice – If conditional -Collocations– Phrasal verbs

## **UNIT4: PRESENTATION SKILLS**

**Listening**- Listening to presentation. Listening to lectures.Watching–documentaries (discovery / history channel)

**Speaking** – Short speech

- Making formal presentations(PPT)

**Reading**– Reading a written speech by eminent personalities in the relevant field/Short poems / Short biography.

**Writing**- Writing Recommendations

Interpreting visuals -charts/ tables/ flow diagrams /charts

**Grammar in Context**– Modals

**Vocabulary** (register) - Single word substitution

## **UNIT5: CRITICAL THINKING SKILLS**

**Listening-** Listening to advertisements/news and brief documentary Films(with subtitles)

**Speaking** – Simple problems and suggesting solutions.

**Reading:** Motivational stories on ProfessionalCompetence, Professional Ethics and Life Skills (subject-specific)

**Writing** Studying problem and finding solutions- (Essayin200 words)

**Grammar-**Make simple sentences

**Vocabulary-**Fixed expressions SUGGESTED ACTIVITIES

# ENVIRONMENT & SUSTAINABILITY

## PART-IV ENVIRONMENTAL STUDIES(Theory)

**First Year**

**Code: 22UGCES**

**Semester - II**

**Credit: 2**

### Course Objectives:

- To appreciate the scope Of Environmental Studies, Community Ecology and the Interdisciplinary nature of environmental issues
- To have a basic knowledge of Natural resources its classification, concepts, and natural resources of India.
- The course designed to gain knowledge on values of biodiversity and conservation on global, national, and local scales
- To study about sources and effect environmental pollution like air, water, soil, thermal, marine, nuclear and noise
- To understand the concerns related to Sustainable Development on environment and health
- To introduce the students in the field of Law and Policies and Acts both at the national and international level relating to environment.

**UNIT-1:** The Multidisciplinary nature of environmental studies  
Definition,scope and importance. (2 lectures)  
Need for public awareness

**UNIT-2:** Natural Resources:  
Renewable and non-renewable resources:  
Natural resources and associated problems.

- a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity, case studies.
- e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- f) Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 lectures)

**Unit: 3 Ecosystems**

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
  - a. Forest ecosystem
  - b. Grassland ecosystem
  - c. Desert ecosystem
  - d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

**Unit: 4 Biodiversity and its conservation**

- Introduction – Definition: Genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Biological Diversity Act 2002/BDRules, 2004

(8 lectures)

**Unit: 5 Environmental Pollution**

Definition Causes, effects and control measures of:

- Air Pollution
- Water Pollution
- Soil Pollution
- Marine Pollution
- Noise pollution
- Thermal Pollution

g. Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides.
- Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards, Types of Fire, Firework and Safety

(8 lectures)

**Unit: 6 Social Issues and the Environment**

- From Unsustainable to Sustainable development.
- Urban problems related to energy.
- Water conservation, rainwater harvesting, watershed management.
- Resettlement and rehabilitation of people; its problems and concerns. Case studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumer is made waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation
- Public awareness.

(7 lectures)

**Unit: 7 Human Population and the Environment**

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights-Value Education
- HIV/ AIDS- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

**Unit: 8 Field Work**

- Visit to a local area to document environmental assets- river/ forest/ grassland/ hill / mountain

## References:

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2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt Ltd, Ahamedabad –380013, India, E-mail: [mapin@icenet.net](mailto:mapin@icenet.net)(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480p
4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. McKinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
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14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamental Ecology. W.B. Saunders Co. USA. 574p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p

(M) Magazine (R) Reference (TB) Textbook

<http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf>.

## **Course Outcomes:**

- Understand the environmental importance including interactions across local to global scales.
- The learners to update and analyze environmental relationships and interactions of Environmental components
- The student to gain knowledge on importance of natural resources in a systematic way.
- The course content is to introduce the concept of renewable and non-renewable energy resources and its scenario in India and at global level
- The students will know the relationship between biodiversity and ecosystem functions, direct and indirect values of biodiversity resources and their bio prospecting opportunities.
- The learner can gain awareness related to environmental pollution, causes and pollution control with case studies.
- Student to obtain the environmental ethics and gain knowledge about sustainable development.
- Learners should realize the environmental legislation and policies of national and international regimes and know the regulations applicable to industries and other organizations with significant environmental aspects

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**Second Year****CORE COURSE III  
PROGRAMMING IN PYTHON  
(Theory)****Semester III****Code: 22SCCCS3****Credit:5****COURSEOBJECTIVE:**

- To develop programs using functions and pass arguments in Python.
- To write programs using loops and decision statements in Python.
- To design and program Python applications.

**UNIT - I:**

Introduction to Python: Features of Python – How to Run Python - Identifiers  
- Reserved Keywords-Variables – Comments in Python – Indentation in Python  
- Multi – Line Statements - Multiple Statement Group(Suite)- Quotes in Python  
- Input, Output and Import Functions - Operators. Data Types and Operations:  
Numbers – Strings – List – Tuple –Set – Dictionary – Data type conversion.

**UNIT- II:**

Flow Control: Decision Making – Loops – Nested Loops –Types of Loops.  
Functions: Function Definition – Function Calling- Function Arguments -  
Recursive Functions - Function with more than one return value.

**Unit - III:**

Modules and Packages: Built - in Modules - Creating Modules - import  
Statement – Locating Modules –Namespaces and Scope –The dir() function-  
The reload() function – Packages in Python – Date and Time Modules. File  
Handling- Directories in Python.

**UNIT - IV:**

Object – Oriented Programming: Class Definition – Creating Objects -  
Built-in Attribute Methods - Built-in Class Attributes – Destructors in  
Python – Encapsulation - Data Hiding – Inheritance - Method Overriding-  
Polymorphism.

**UNIT-V:**

Exception Handling: Built-in Exceptions – Handling Exceptions - Exception  
with Arguments – Raising Exception - User-defined Exception - Assertions  
in Python.Regular Expressions:The match() function -The search() function  
- Search and Replace - Regular Expression Modifiers: Option Flags-Regular  
Expression Patterns – Character Classes-Special Character Classes-  
Repetition Cases- find all() method - compile() method.

## **UNIT–VI CURRENT CONTOURS(For continuous internal assessment only):**

An Introduction to Interactive Programming in Python – Study on Julia—an high level language approach.

### **REFERENCES:**

1. Jeeva Jose and P. Sojan Lal, “Introduction to Computing and Problem Solving with PYTHON”, Khanna Book Publishing Co, 2016.
2. Mark Summer field.—Programming in Python 3: A Complete introduction to the Python Language, Add is on-Wesley Professional, 2009.
3. Martin C. Brown, —PYTHON: The Complete Reference, McGraw-Hill, 2001
4. Wesley J. Chun, “Core Python Programming”, Prentice Hall Publication, 2006.
5. Timothy A Budd, “Exploring Python”, Tata McGraw Hill, New Delhi, 2011
6. JakeVanderPlas,“Python DataScience Handbook:Essential Tools for Working with Data”,O'Reilly Media,2016.
7. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O Reilly Publishers, 2016
8. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python –Revised and updated for Python3.2,Network Theory Ltd.,2011.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- To recall and understand the features of python programming language
- To illustrate various programming mechanism used in python
- To apply various language construct to write simple programs in python
- To examine the application of object oriented concept in python
- To distinguish the various constructs used in python.

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## PROFESSIONAL ETHICS

Second Year

### CORE PRACTICAL III PROGRAMMING IN PYTHON LAB (Practical)

Semester III

Code: 22SCCCS3P

Credit: 4

#### COURSE OBJECTIVES:

- To write, test, and debug simple Python programs.
  - To implement Python programs with conditionals and loops.
  - To represent compound data using Python lists,tuples,and dictionaries.
1. Flow controls,Functions and String Manipulation
  2. Operations onTuples and Lists
  3. Operation on sets
  4. Operations on Dictionary
  5. Simple OOP–Constructors–create a class for representing a car
  6. Method Overloading – create classes for vehicleand Bus and demonstrate method overloading
  7. Files – Reading and Writing – perform the basic operation of reading and writing with student file
  8. Regular Expressions
  9. Modules
  10. Packages
  11. Exception Handling

#### COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Write simple programs using control structures,functions and strings
- Develop programs using tuples, lists,sets and dictionary
- Write simple programs using Constructors,Method overloading and inheritance
- Develop programs using files and regular expressions
- Write simple programs using packages and exception handling

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**APPLIED PHYSICS FOR B.Sc.COMPUTER SCIENCE PROGRAMME ONLY**  
(For the candidates admitted from the academic year 2022-23 onwards)

**ALLIED COURSE I**  
**APPLIED PHYSICS I**

**Code: 22SCACAP1A**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES:**

- To bring out the subjects related with the computer field which help students to keep Space with these topics.
- To make the students understand the basic concepts of current electricity alternating current and the related laws.
- To enable the learners to acquire knowledge about four different number systems, conversion, Boolean algebra, Logic gates and semiconductor memories.

**UNIT – I CURRENT ELECTRICITY:**

Ohm's Law- Verification of Ohm's Law - Kirchhoff's law- Applications of Kirchhoff's law Wheat stone's bridge - Metre bridge - Carey Foster's bridge- Potentiometer Measurement of Current and Resistance- Calibration of low range Voltmeter.

**UNIT – II ALTERNATING CURRENT:**

AC circuits with double components – measurement of current and voltage – power in an AC Circuit – Power Factor(derivation) – Wattless current– Choke – series and parallel resonant circuits – Impedance - Q factor - Sharpness of resonance.

**UNIT-III NUMBER SYSTEMS CODES AND LOGIC GATES:**

Number Systems - Conversions - Binary: Addition, Subtraction, Multiplication, Division- 8421 Code - BCD Code - Excess 3 code - Gray code - Binary to Gray and Gray to Binary Conversion - ASCII code – Basic and Derivative Gates: AND, OR, NOT, NAND, NOR, EX-OR - NAND & NOR as Universal Gates.

**UNIT – IV BOOLEAN ALGEBRA, ARITHMETIC AND COMBINATIONAL LOGIC CIRCUITS:**

Basic laws of Boolean algebra - De Morgan's theorem - Verification of Boolean expression using Boolean laws - Half-adder - Full adder - Half-Sub tractor- Full sub tractor (using basic gates) – Encoder - Decimal to BCD encoder - Decoder - BCD to decimal decoder.

**UNIT–V SEMI CONDUCTOR MEMORIES:**

Introduction – ROM using diodes and transistors – ROM in terms of digital circuits – Building memory of larger capacity – PROM – EPROM – EEPROM – ROM as a unit in microcomputers – RAM – Static RAM – Dynamic RAM – Memory Parameters.

**UNIT–VI CURRENT CONTOURS(For continuous internal assessment only):**

Solar electricity – Hydro electricity - Digital camera – Digital television – CRO – Digital computer

## REFERENCES:

1. BrijLaland N.Subrahmanyam, *A TextBook of Electricity and Magnetism*,S.Chand & Company Pvt. Ltd, New Deihi-2020.
2. Puri V.K.,*Digital Electronics circuits and systems*,TATA Mcgrawhill publications,New Delhi, 2011.
3. Vijayendran. V& Subramanian. V, *Introduction to Integrated Electronics*, S. Viswanath PVT Ltd., Chennai 2012.
4. Murugesan. R, *Electricity and Magnetism*, S. Chand & Company Ltd., Tenth edition, 2017.
5. Sundara velusamy. A, *Applied Physics Paper-I B.Sc Computer Science*, Karur: Priya Publications, 2011.
6. Narayanamurthi and Nagarathinam, *Electricity and Magnetism*, The National Publishing Company, Madras, 1994.
7. Murugesan.R, *Electricity and Magnetism*,S.Chand& Company Ltd.,2015.
8. GothamamW.H.,*Digital Electronics*,Prentice Hall of India PVT.,NewDelhi,1996.
9. Sanjay D Jain, *Applied Physics*, Universities Press, Hyderabad,Telangana.2013
10. Tewari K K, *Electricity and Magnetism*, S.Chand & Company Ltd.,3<sup>rd</sup> edition,2007.
11. Sathya Prakash, *Electricity and Magnetism*,Pragati prakashan,2016.
12. Arthur Beiser,*Concepts of Modern Physics* 2009, McGraw-Hill
13. J.R.Taylor,C.D.Zafiratos, M.A.Dubson,*Modern Physics*,2009,PHILearning.
14. Albert Paul, Malvino, *Digital Principles and Applications*, Delhi:Tata Mcgrawhill Publishing, 2012.
15. Tewari K K, *Electricity and Magnetism*,S.Chand & Company Ltd.,3<sup>rd</sup> edition,2007.
16. 1.<https://archive.nptel.ac.in/courses/115/106/115106122/>
17. 2.<https://pages.uoregon.edu/rayfrey/DigitalNotes.pdf>
18. 3.<https://nptel.ac.in/courses/117106086>

## COURSE OUTCOMES:

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

- Recall the basic concepts of current electricity and its various laws.
- Solve basic electronics problems with ac circuits that involve capacitance, inductance, impedance, reactance and power calculations.
- Differentiate all the four number systems studied.
- Review Boolean algebra and draw arithmetic circuits.
- Analyse the calibration of electrical instruments.

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## PROFESSIONAL ETHICS, HUMAN VALUES

Second Year

NON MAJOR ELECTIVE COURSE - I  
1.E-COMMERCE

Semester – III

Code: 22BNMEBB1

(Theory)

Credit: 2

### COURSE OBJECTIVES:

- To understand the conceptual foundations of marketing management as a functional area of business.
- Analyse the impact of E-commerce on business models and strategy.
- Explain the process that should be followed in building an E-commerce presence.

### UNIT - I:

Introduction to E-Commerce – Electronic Commerce Framework – Electronic commerce and Media convergence – The anatomy of E - Commerce Applications – Components of the I Way – Network Access Equipment – Global Information Distribution Networks– Internet Terminology –NSF NET: Architecture and Components - National Research and Educational Network.

### UNIT - II:

Electronic Commerce and World Wide Web:Architectural Framework for E-Commerce –WWW Architecture – Hypertext Publishing – Consumer Oriented Applications–Mercantile Process Models–Consumer’s Perspective – Merchant’s Perspective – Electronic Payment Systems(EPS) –Types - Designing EPS - Smart Cards and EPS – Credit Cards and EPS.

### UNIT- III:

Electronic Data Interchange (EDI): Applications – Security and Privacy Issues – Software Implementations – Value Added Networks – Internal Information System – Work - flow Automation and Coordination – Customization– Supply Chain Management.

### UNIT - IV:

Marketing on the Internet: Advertising on the Internet –Charting the On-Line Marketing Process – E- Commerce Catalogs or Directories – Information Filtering – Consumer - Data Interface: Emerging Tools.

### UNIT - V

Multimedia and Digital Video: Concepts – Digital Video and E-Commerce –Video Conferencing – Frame Relay – Cell Relay – Mobile Computing - Frame Work –Wireless Delivery Technology – Cellular Data Communication Protocols.

### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Contemporary Developments Related to the E-Commerce - Studying: Electronic data interchange,Security and Privacy Issues – Group Discussion ethical issues on E –Commerce.

## **TEXT BOOKS:**

- i. Turban, E., Outland, J., King, D., Lee, J. K., Liang, T., & Turban, D. C. Electronic Commerce: A Managerial and Social Networks Perspective (Springer Texts in Business and Economics) Springer, 2017.
- ii. Chaffey, D., Hemphill, T., & Edmundson-Bird, D. (2019). Digital Business and E-Commerce Management (7th ed.). Pearson 2018.

## **REFERENCES BOOKS:**

1. Pribyl, I., & Pribyl, R. From Nothing: Everything You Need to Profit from Affiliate Marketing, Internet Marketing, Blogging, Online Business, e-Commerce and More. The Free Internet Marketing Project, 2019.
2. Frontiers of Electronic Commerce - Ravi Kalakota, Andrew Winston, 2018.
3. Chakraborty, S., & Tyagi, P. E-Commerce for Entrepreneurs. BPB PUBLN, 2021.

## **E -RESOURCES**

1. <https://www.edx.org/learn/ecommerce/>
2. <https://www.coursera.org/courses?query=e-commerce/>
3. <https://www.udemy.com/topic/e-commerce/>

## **COURSE OUTCOMES:**

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

- To identify core concepts of marketing and the role of marketing in business and society. Knowledge of social, legal, ethical and technological forces on marketing decision-making.
- Appreciation for the global nature of marketing and appropriate measures to operate effectively in international settings.
- Ability to develop marketing strategies based on product, price, place and promotion objectives.
- Ability to create an integrated marketing communications plan which includes promotional strategies and measures of effectiveness.
- Ability to communicate the unique marketing mixes and selling propositions for specific product offerings.

## PROFESSIONAL ETHICS, HUMAN VALUES

Second Year

Semester III

### PROFESSIONAL ENGLISH [PART-III-ADD ONCOURSE]

Weightage: 4 Credits

Duration: 90 hrs

Code: 22PELPS2

#### Objectives:

The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges

- Develop their competence in the use of English with particular reference to the workplace situation.
- Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.
- Develop their competence and competitiveness and there by improve their employability skills.
- Help students with are search be to mind develop their skills in writing reports and research proposals.

#### Unit 1- Communicative Competence

(18 hrs)

Listening: Listening to two talks /lectures by specialists on selected subject specific topics - (TEDTalks) and

answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages -

Openended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary Writing based on the reading passages.

**Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.**

#### Unit 2 - Persuasive Communication

(18 hrs)

Listening: listening to a product launch - sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just - A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing – writing an argumentative / persuasive essay.

#### Unit 3 – Digital Competence

(18 hrs)

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

#### **Unit 4 – Creativity and Imagination**

**(18 hrs)**

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC /other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating blogs, flyers and brochures (subject based)

- Poster making–writing slogans/captions (subject based)

#### **Unit 5 – Workplace Communication & Basics of Academic Writing (18 hrs)**

Speaking: Short academic presentation using Power Point

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, Paraphrasing Punctuation (period, questionmark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of uppercase)

#### **Out comes of the Course.**

- At the end of the course, learners will be able to,
- Attend interviews with boldness and confidence.
- Adapt easily into the workplace context, having become communicatively competent.
- Apply to the Research & Development organisations/sections in companies and offices with winning proposals.

# PROFESSIONAL ETHICS

Second Year

CORE COURSE IV

Semester IV

## DATA BASE MANAGEMENT SYSTEMS

Code: 22SCCS4

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- To impart the basic database concepts, applications, data models, schemas and instances.
- To familiarize Entity Relationship model for a database.
- To Demonstrate the use of constraints and relational algebra operations.

### UNIT-I:

Introduction: Database -System Applications - Purpose of Database Systems - View of Data - Database Languages – Relational Databases – Database Design – Data Storage and Querying Transaction Management- Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems.

### UNIT- II:

Relational Model: Structure of Relational Databases- Database Schema - Keys– Schema Diagrams - Relational Query Languages - Relational Operations Fundamental Relational- Algebra Operations Additional Relational - Algebra Operations - Extended Relational - Algebra Operations - Null Values - Modification of the Database.

### UNIT-III:

SQL Overview of the SQL Query – Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations- Null Values Aggregate Functions – Nested Subqueries – Modification of the Database -Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas – Authorization.

### UNIT-IV:

Relational Languages: The Tuple Relational Calculus - The Domain Relational Calculus Database Design and the E-R Model: Overview of the Design Process - The Entity- Relationship Model - Reduction to Relational Schemas -Entity- Relationship Design Issues – Extended E-R Features – Alternative Notations for Modeling Data - Other Aspects of Database Design

### UNIT-V:

Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional- Dependency Theory - Decomposition Using Functional Dependencies - Decomposition Using Multivalued Dependencies- More Normal Forms - Database-Design Process

## **UNIT - VI: CURRENT CONTOURS (for Continuous Internal Assessment**

**Only):** Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. Data base System Concepts, Sixth edition, Abraham Silbers chatz, Henry F.Korth, S.Sudarshan, McGraw-Hill-2010.
2. Jagdish Chandra Patni, Hitesh Kumar Sharma, Ravi Tomar, Avita Katal., "Database Management System: An Evolutionary Approach", CRC Press, 2022.
3. Abraham Silbers chatz, Henry F.Korth, S.Sudarshan, "Database System Concepts", 6th Edition, McGraw Hill International, 2019.
4. Blokdyk, Gerardus, and Blokdyk, Gerardus, "RDBMS Relational Database Management System a Complete Guide", 2020 Edition, Emereo Pty Limited, 2019.
5. Wilfried Lemahieu, Seppevanden Broucke, Bart Baesens, "Principles of Database Management: The Practical Guide to Storing, Managing and Analyzing Big and Small Data", Cambridge University Press, 2018.
6. C.J.Date, "An Introduction to Database Systems" Addison Wesley, 2000.
7. <https://tutorialspoint.dev/computer-science/dbms>

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Understand the basic concepts of Data base Systems
- Know about SQL queries to interact with Database
- Design a Database using ER Modelling
- Apply normalization on database design to eliminate anomalies
- Analyze database transactions and to control them by applying ACID properties.

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# PROFESSIONAL ETHICS

## ALLIED COURSE II APPLIED PHYSICS II

Code: 22SCACAP2A

(Theory)

Credit:4

### COURSE OBJECTIVES:

- To impart knowledge of certain important fields of physics by simplifying the learning process to a greater extent
- To make the students understand how Laser and Maser is powerful than normal light, their types and its advantages.
- To inculcate the knowledge of transistor and different configurations, H parameters and applications of FET amplifier.

### UNIT-I SEMI CONDUCTOR PHYSICS

Theory of energy bands in crystals- Distinction between conductors, Insulators and Semiconductors – Intrinsic and Extrinsic semiconductors – Hall effect in semiconductor – Zener diode – Tunnel diode - Backward diode - Breakdown voltage avalanche Breakdown.

### UNIT-II TRANSISTORS:

Transistors- PNP and NPN transistors – DC Characteristics of CE and CB configuration- Hybrid parameters- Functions of Transistor as an amplifier and oscillator – FET-N-channel FET - performance Characteristics - FET amplifier.

### UNIT-III LASERS:

Laser and Maser - Basic concepts of stimulated emission – Population inversion and Meta stable state- He- N laser- Ruby laser- Ammonia Maser- production – Advantages.

### UNIT-IV OPTO-ELECTRONIC DEVICES:

LED Radiation transition - Emission spectra – Luminescent efficiency - Method of Excitation- Visible LED- Materials for LED - LED configuration - Photo conduction – Photo diode- Photo transistor - electronic watches- seven segment display - LCD.

### UNIT-V OPERATIONAL AMPLIFIER:

The basic operational amplifier – Inverting and Non inverting operational Amplifier – Differential operational amplifier- CMRR- Basic uses of operational amplifier as sign and scale changer and phase shifter – Adder – Subtractor – comparator - Differentiator - ADC Successive approximation.

### UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Electric car technology – IOT sensors and devices- Robot control - Laser cladding- Barcode reader- Laser surgery- Laser pointer- ADC- DAC.

## REFERENCES:

1. Jacob Millman, Micor electronics, McGraw Hill publications, NewDelhi,1985.
2. Mithal G.K.and Vanvasi, Pulse and Digital electronics, Khanna publication, New Delhi, 2006.
3. Sundara velusamy, A, Applied Physics Paper-II B.Sc Computer Science, Karur: Priya Publications, 2011.
4. Theraja, BL, Electronics Devices & Circuits, Delhi:S.Chand & Co,2011
5. [Mehta V.K. & Mehta Rohit](#), Principles of Electronics (Multicolour Edition) ,10th Rev.edition,2006
6. Ramanan, Function Electronics,TMH, New Delhi,1994.
7. Millman & Halkias, Electronics devices and Circuits, Mc Graw-Hill, 1967.
8. J.R.Taylor, C.D.Zafiratos, M.A.Dubson, *Modern Physics*, 2009, PHI.
9. Sanjay DJain, Engineering Physics, Universities Press, Hyderabad, Telengana 2012.
10. Ali,SN,Basic Electronics,Delhi:Vayu Education of India,2011
11. AmarK Gangully, Opto Electronic Devices and CircuitsTheory and Applications, Delhi: Narosa Publishing House, 2011.
12. MehtaV.K, Principles of Electronics, S.Chand&Co, 2005.electronics.
13. [William T. Silfvast](#), *Laser fundamentals* Second edition, University of Central Florid, Cambridge University Press, June 2012.
14. [K. Thyagarajan Ajoy Ghatak](#), *Lasers- Fundamentals And Applications* ,Edition: 2,Laxmi Publications Pvt Ltd,2019
15. Thomas F. Schubert, Jr. And Ernest M. Kim.*Fundamentals Of electronics. Book 1, Electronic devices and circuit applications*, San Rafael, California (1537 Fourth Street, San Rafael, CA 94901 USA): Morgan & Claypool, 2014.
16. <https://nptel.ac.in/courses/115102025>
17. <https://www.classcentral.com/course/swayam-laser-fundamentals-and-applications-12914>.
18. [https://www.tutorialspoint.com/linear\\_integrated\\_circuits\\_applications/linear\\_integrated\\_circuits\\_applications\\_op\\_amp\\_applications.htm](https://www.tutorialspoint.com/linear_integrated_circuits_applications/linear_integrated_circuits_applications_op_amp_applications.htm)

## COURSE OUTCOME:

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

- Understand the rapid growth of electronic technology.
- Know the semi conductors classification and their applications in various domains.
- Analyse the characteristics of transistor, transistor biasing circuits and oscillator circuits.
- Evaluate the advantages of Opto-Electronic Devices.
- Demonstrate analog electrical devices, particularly operational amplifiers and their applications applying the learnt concepts.

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# PROFESSIONAL ETHICS

Second Year

NON MAJOR ELECTIVE COURSE-II

Semester-IV

## 1. BUSINESS ETHICS

Code:22BNMEBB3

(Theory)

Credit:2

### COURSE OBJECTIVES:

- To understand the concept of Ethical value
- Analyze the ethical issues involved in business
- The best way to manage ethical conduct in business

### UNIT- I:

Business Ethics - Meaning – Definition – Nature – Importance – Ground Rules – Myths – Methodology – Characteristics of Managerial Ethics -Factors Influencing Business Ethics - Types Of Ethical Issues-Corruption In Businesses.

### UNIT- II:

Ethical Values- Work Ethics–Work Culture–Ethical Theories–Ethical values - Environmental Ethics – Consumer Protection..

### UNIT- III:

Managing Ethical Conduct - Skills for Managers - Whistle Blowing – Individual differences and Ethical Judgments – Cognitive Barriers to Ethical Judgment- Corporate Social Responsibility towards the community.

### UNIT-IV:

Corporate Governance - Issues – need – corporate governance code - transparency & disclosure - role of auditors - board of directors and share holders - corporate scams - Committees in India.

### UNIT- V:

Consumerism– unethical issue in sales, marketing and technology–competitive strategy.

### UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Practical: Collection of data about unethical strategy followed in the products

### TEXT BOOKS:

1. Dr.S.Sankaran. Business Ethics & Values, 2010, Margham Publication.
2. Fernando.A.C., Business Ethics–An Indian Perspective, 3<sup>rd</sup> Edition, Pearson Publication

## **REFERENCE BOOKS:**

1. Hasnian Baber, Business Ethics and Corporate Governance, 2<sup>nd</sup> Edition, Global Vision Publishing House
2. Chakraborty, S.K., Management by Values, 2014, Oxford Univ. Press.
3. Velasquez, Business Ethics-Concepts and Cases, Prentice Hall, 5th Edition.

## **E –RESOURCES:**

- <https://www.economicdiscussion.net/business/business-ethics/31798>
- <https://tsubakimoto.com/sustainability/governance/corporate/control-policy/>
- <https://elink.io/p/consumerism-9a251f9>

## **COURSE OUTCOME:**

- To outline the significance of ethics in business.
- To know the culture of organisation
- To appreciate the best ethical practices in every actions of organization
- To recognize the importance of Corporate Social Responsibility.
- Students can the understand the unethical issues in the environment.

**COURSE OBJECTIVES:**

- To understand the basic concepts and the applications of database systems using MYSQL.
  - To create and perform basic operation with MYSQL.
  - To interact with MYSQL by using nested queries, set of aggregate operations and views.
1. Create a table and perform the following basic my sql operations
    - a. Set the primarykey
    - b. Alter the structure of the table
    - c. Insert values
    - d. Delete values based on constraints
    - e. Display values using various form so fselect clause
    - f. Drop the table
  2. Develop my sql queries to implement the following set operations
    - a. Union
    - b. Unionall
    - c. Intersect
    - d. Intersectall
  3. Develop my sql queries to implement the following aggregate functions
    - a. Sum
    - b. Count
    - c. Average
    - d. Maximum
    - e. Minimum
    - f. Group by clause & having clause
  4. Develop my sql queries to implement following join operations
    - a. Natural join
    - b. Inner join
    - c. Outer join- left outer, right outer, full outer
    - d. Using join conditions
  5. Develop mysql queries to implement nested subqueries
    - a. Set membership(int, not int)
    - b. Set comparison(some, all)
    - c. Empty relation(exists, not exists)
    - d. Check for existence of Duplicate tuples(unique, notunique)
  6. Develop mysql queries to create views and expand it.
  7. Develop mysql queries to implement
    - a. String operations using %
    - b. String operations using ‘\_’

- c. Sort the element using a sc, desc  
[\*create necessary relations with requires attribute]
8. Consider the following database for a bankin enterprise BRANCH (branch- name: string, branch-city:string, assets:real) ACCOUNT(accno:int, branch-name:string, balance: real) DEPOSIT OR (customer-name:string, accno:int) CUSTOMER (customer-name: string, customer-street: string, customercity: string) LOAN (loan-number:int, branch-name: string, amount:real) BORROWER (customer-name:string,loan-number:int)
- i. Create the above tables by properly specifying the primary keys and the
  - ii. Foreign keys
  - iii. Enter atleast five tuples for each relation
  - iv. Find all the customers who have atleast two accounts at the Main Branch.
  - v. Find all the customers who have an account at all the branches located
  - vi. In a specific city.
  - vii. Demonstrate how you delete all account tuples at every branch located in a specific city. Generate suitable reports.
  - viii. Create a suitable front end for querying and displaying the results.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Write queries to manipulate data.
- Demonstrate the aggregate functions and set operations.
- Apply the join operations.
- Know about usage of nested subqueries.
- Understand the method to create views.

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# PROFESSIONAL ETHICS

## ALLIED PRACTICAL APPLIED PHYSICS (Practical)

Code: 22SCACAP1AP

Credit: 2

### COURSE OBJECTIVES:

- To familiarize students with basic laboratory equipment to study the physics concepts encountered in the lecture course.
- To give knowledge of some basic electronic components and circuits.
- To promote the exhaustive requirements and expectations of the students to acquire practical knowledge for the theory given in their syllabus.

### ANY 12 EXPERIMENTS:

1. Semi-Conductor diode-Characteristics.
2. Zenerdiode-Characteristics.
3. FET-Characteristics.
4. Transistor Characteristics - CE configuration.
5. Transistor Characteristics - CB Configuration.
6. Field along the axis of a coil-Determination of Mand H
7. Metre Bridge-Determination of Specific Resistance.
8. Potentio meter- Measurement of Current.
9. Potentiometer-Calibration of low range voltmeter.
10. Carey Foster's Bridge-Determination of Specific Resistance.
11. LCR-Series resonance circuit
12. LCR-Parallel resonance circuit
13. Mathematical Operator-Addition, Subtraction using OP-Amp.
14. Logic Gates (AND, OR, NOT, NAND, NOR) Using IC's. -Verification of truth tables.
15. NAND and NOR as Universal Gates.
16. Verification of De-Morgan's Theorems.
17. Half Adder and Half Subtractor using logic gates.
18. Full Adder and Full Subtractor using logic gates.
19. Single Stage Amplifier.
20. Logic Gates (AND, OR, NOT) Using Discrete's.Components-Verification of truth tables.

### REFERENCES:

1. Srinivasan M.N. Balasubramanian S. & Renganathan R., A Text book of Practical Physics, Sulthan Chand & Sons, New Delhi, 2000.
2. Somasundram S., Practical Physics, Apsara Publications, Tiruchirappalli. 2012.
3. Arora C L., B.Sc. Practical physics, Chandand company, 2010.
4. Department of Physics, Practical Physics, (B.Sc. Physics Main), St. Joseph's College, Tiruchirapalli 2009. .
5. Kushwaha P S., Applied physics practical & viva-voce, Bharat Bharati Prakashan & Co, 2015.
6. John Henderson, Practical Electricity and Magnetism, Forgotten books publisher, 2018.

7. Tooley M., Practical Digital Electronics Hand book Bpb Publications, 2008
8. <https://nptel.ac.in/courses/122106025>
9. [https://onlinecourses.nptel.ac.in/noc20\\_ph16/preview](https://onlinecourses.nptel.ac.in/noc20_ph16/preview)

## **COURSE OUTCOMES:**

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

- Gain the practical knowledge about electricity, magnetism and measurements such as resistance, voltage, current.
- Distinguish electronic components
- Construct the learn teletronic circuits on their own
- Analyze the logic gates and their usage in digital circuits.
- Develop the skill of conducting an experiment collaboratively.

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## PROFESSIONAL ETHICS

**Third Year**

**CORE COURSE VI  
FUNDAMENTALS OF ALGORITHMS  
(Theory)**

**Semester V**

**Code : 22SCCCS5**

**Credit : 5**

**OBJECTIVES:**

- To study the fundamentals of algorithms
- To understand trees, traversals and about shortest path.
- To know about the different algorithms related to sorting, optimality and Backtracking

**UNIT - I:**

Introduction – Algorithm Specification, Pseudo code for expressing algorithms, Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Performance Measurement, Randomized algorithms.

**UNIT - II:**

Trees – Binary tree representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals, Connected Components and Spanning Trees – Shortest Paths and Transitive closure – Activity Networks – Topological Sort and Critical Paths.

**UNIT - III:**

Algorithms – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort – Binary Search – Finding the Maximum and Minimum.

**UNIT - IV:**

Greedy Method: The General Method – Optimal Storage on Tapes – Knapsack Problem – Job Sequencing with Deadlines – Optimal Merge Patterns

**UNIT - V:**

Back tracking The General Method – The 8-Queens Problem – Sum of Subsets – Graph colouring.

**UNIT VI:**

CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

**REFERENCES:**

1. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structure", Galgotia Publications, 2008.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", University Press, 2008.
3. Seymour Lipschutz, "Data Structures", TataMcgraw Hill, Schaum's Outline Series, 2014.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Know the basic concepts of algorithms
- Understand trees and shortest path algorithms.
- Compare and contrast different sorting algorithms
- Comprehend greedy and optimality algorithms.
- Appreciate the backtracking concept and its different algorithms.

## PROFESSIONAL ETHICS

**Third Year**

**CORE COURSE VI  
COMPUTER NETWORKS  
(Theory)**

**Semester V**

**Code: 22SCCCS6**

**Credit: 5**

### **COURSE OBJECTIVES:**

- To describe the general principles of Computer Networks.
- To describe how the different layers in a computer network work
- To know about Wired LAN: IEEE Standards and Satellite networks.

### **UNIT - I:**

Data Communication – Networks – The Internet – Protocols and Standards – OSI Model- Layers in OSI Model - TCP/IP Protocol Suite – Addressing.

### **UNIT - II:**

Analog and Digital – Digital Signals – Transmission Impairment – Performance – Multiplexing – Guided Media – Unguided Media. Switching: Circuit Switched Networks – Datagram Networks – Virtual Circuit Networks

### **UNIT -III:**

Data Link Layer: Error Detection and Correction -Introduction – Block Coding: Error detection, Error correction – Data Link Control: Framing – Flow and Error Control – Protocols – Noiseless Channels – Noisy channels – HDLC – Point to Point Protocol.

### **UNIT - IV:**

Wired LAN: IEEE Standards – Standard Ethernet. Wireless LAN: IEEE 802.11 –Bluetooth. Connecting LANs: Connecting Devices – Virtual LANs. Wireless WAN: CellularTelephony – Satellite Networks. Network Layer-Logical Addressing: IPv4 Addresses – IPv6 Addresses.

### **UNIT - V:**

Transport Layer: Process to Process Delivery – User Datagram Protocol - TCP. Application Layer: Domain Name Space – DNS in the Internet – Electronic Mail – File Transfer.WWW: Architecture – HTTP.

### **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. Behrouz A. Forouzan, “Data Communications and Networking”, McGraw-Hill Companies, New York, 5th Edition, 2017.
2. William Stallings “Data and computer communications”, Prentice Hall of India, 7<sup>th</sup> Edition, 2004.
3. Andrew S Tanenbaum, “Computer Networks”, Prentice Hall of India, New Delhi, 2013.
4. Dr M. P. Vani, "Data Communication and Computer Network", Notion Press, 2019.25
5. Hazim Gaber, "Understanding Computer Networks 2020", Independently Published,2020.
6. Grigorios N. Beligiannis, Ram Palanisamy, S. Smys, Álvaro Rocha, "Computer Networks and Inventive Communication Technologies", Springer, 2021.
7. <https://www.guru99.com/data-communication-computer-network-tutorial.html>

## **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Recall the basic concepts of computer networks
- Summarize the technical specifications of various layers of the OSI model in a computer network
- Identify the appropriate protocols and standards for computer networks
- Classify technical factors of cellular networks and satellite communication
- Know about the different functionalities of an application layer.

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## PROFESSIONAL ETHICS

Third Year

**CORE PRACTICAL V**  
**DIGITAL ELECTRONICS AND MICROPROCESSOR**  
(Theory)

Semester V

Code: 22SCCCS7

Credit: 5

### COURSE OBJECTIVES:

- To impart knowledge about the basics of Digital Systems
- To focus on the study of Boolean algebra, Combinational circuits.
- To impart knowledge about basic parts and functions of microprocessor and
- to have an understanding of the Registers, Interrupts, Interfaces, Buses, Pins,
- Instructions of 8085 microprocessor

### UNIT - I:

Digital Systems and Binary Numbers - Digital Systems - Binary Numbers -Number Base Conversions - Octal and Hexadecimal Numbers - Complements of Numbers. Signed Binary Numbers - Binary Codes - Binary Storage and Registers- Binary Logic

### UNIT - II:

Boolean Algebra and Logic Gates - Introduction - Basic Definitions – Axiomatic Definition of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra. Boolean Functions - Canonical and Standard Forms - Other Logic Operations - Digital Logic Gates - Integrated Circuits.

### UNIT - III:

Combinational Logic - Introduction - Combinational Circuits - Analysis of Combinational Circuits - Design Procedure - Binary Adder - Subtractor – Decimal Adder - Binary Multiplier - Magnitude Comparator - Decoders - Encoders - Multiplexers - HDL Models of Combinational Circuits.

### UNIT - IV:

Evolution of Microprocessor – Single chip Microcomputer – Microprocessor Applications –Buses-Memory Addressing capacity and CPU – Microcomputers – Processor Architecture – Intel 8085 – Instruction cycle – Timing Diagram.

### UNIT - V:

Instruction Set of Intel 8085 – Instruction and Data Format – Address Modes – Status Flags – Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler.

### UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

### REFERENCES:

1. M. Morris R. Mano, Michael D. Ciletti. Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog, 6th Edition, 2018
2. Badri Ram, “Fundamentals of Microprocessors and Microcomputers”, Dhanpat Rai Publications, 2012.
3. Dhanasekharan Natarajan, "Fundamentals of Digital Electronics", Springer International Publishing, 2020
4. Dr. S Salivahanan, "Analog and Digital Electronic", McGraw-Hill Education, 2019.
5. Soumitra Kumar Mandal, "Digital Electronics", McGraw-Hill Education, 2018.

6. A. Anand Kumar, "Fundamentals of Digital Circuits", Prentice Hall India Pvt.Limited, 2016.
7. Senthil Kumar Saravanan, Jeevananthan, "Microprocessors and Microcontrollers", Oxford University Press, 2010.

**COURSE OUTCOMES:**

- Upon successful completion of this course the students would be able to:
- Understand about various number systems
- Know about Boolean Algebra and Logic Gates
- Draw and explain Combinational circuits
- Explain the Evolution of Microprocessors
- Use the Instruction Set of Intel 8085 in simple programs.

## PROFESSIONAL ETHICS

**Third Year**

**MAJOR BASED ELECTIVE I  
2) COMPUTER GRAPHICS  
(Theory)**

**Semester V**

**Code: 22SMBECSIB**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To understand the basic objectives and scope of computer graphics.
- To identify computer graphics applications and common graphics APIs.
- To know the basic structures of 2D and 3D graphics systems.

### **UNIT - I:**

Overview of Computer Graphics System: Video Display Devices – Raster Scan Systems – Random – Scan Systems - Graphics Monitors and Workstations – Input Devices – Hardcopy Devices – Graphics Software.

### **UNIT - II:**

Output Primitives: Line Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle – Generating Algorithms. Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale levels– Area fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions.

### **UNIT - III:**

2D Geometric Transformations: Basic Transformation – Matrix Representations – Composite Transformations – Window to View port Co-Ordinate Transformations. Clipping: Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – Liang Barsky Line Clipping – Polygon Clipping – Sutherland – Hodgman Polygon Clipping – Curve Clipping – Text Clipping.

### **UNIT - IV:**

Graphical User Interfaces and Interactive Input Methods: The User Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques. Three Dimensional Concepts: 3D-Display Methods – #Three Dimensional Graphics Packages.

### **UNIT - V:**

3D Geometric and Modelling Transformations: Translation – Scaling – Rotation – Other Transformations. Visible Surface Detection Methods: Classification of Visible Surface Detection Algorithm –Blackface Detection – Depth-Buffer Method – A-Buffer Method – Scan-Line Method – Applications of Computer Graphics.

**UNIT -VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):**  
Contemporary Developments Related to the Course during the Semester Concerned

**REFERENCES:**

1. Donald Hearn M. Pauline Baker, Computer Graphics C Version, Pearson Education, 2014.
2. Alexey Boreskov, Evgeniy Shikin, "Computer Graphics From Pixels to Programmable Graphics Hardware", CRC Press, 2013.
3. Donald Hearn M. Pauline Baker, "Computer Graphics C Version", Pearson Education, 2014.
4. Branislav Sobota, "Computer Graphics and Imaging", Intech Open Publication, 2019.
5. Dr. Deepali A. Godse, Atul P. Godse, "Computer Graphics", UNICORN Publishing Group, 2020.
6. Gabriel Gambetta, "Computer Graphics from Scratch A Programmer's Introduction to 3D Rendering", No Starch Press, 2021.

**COURSE OUTCOMES:**

- Upon successful completion of this course the students would be able to:
- Understand the basics of Computer Graphics, Different Graphics Systems and Applications of Computer Graphics.
- Learn Algorithms for Scan Conversion and filling of Basic Objects and their Comparative Analysis.
- Use of Geometric Transformations on Graphical Objects and their Application in Composite form.
- Apply 2D Geometric Transformations
- Use 3D Geometric and Modelling Transformations.

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## PROFESSIONAL ETHICS

**Third Year**

**SKILL BASED ELECTIVE I  
WEB TECHNOLOGY  
(Theory)**

**Semester V**

**Code: P22CSCCIB**

**Credit: 2**

### **COURSE OBJECTIVES:**

- To understand the basic concepts related to HTML, JavaScript and VB script.
- To familiarize various concepts associated with Dynamic webpages
- To know about data representation with XML and XSL.

### **UNIT - I:**

HTML: Introduction – SGML – Outline of an HTML Document – Head Section – Body Section – HTML Forms.

### **UNIT - II:**

Java Script: Introduction – Language Elements – Objects of Java Script – Other Objects – Arrays.

### **UNIT - III:**

VB Script: Introduction – Embedding VBScript Code in an HTML Document – Comments – Variables – Operators – Procedures – Conditional Statements – Looping Constructs – Object and VB Script – Cookies.

### **UNIT - IV:**

Dynamic HTML (DHTML): Introduction – Cascading Style Sheets (CSS) – DHTML Document Object Model and Collections – Event Handling.

### **UNIT - V:**

Extensible Mark-Up Language (XML): Introduction – HTML vs XML – Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – The Building Blocks of XML Documents – DTD Elements – DTD Attributes – DTD Entities – DTD Validation – XSL – XSL Transformation.

### **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. N.P. Gopalan and J. Akilandeswari, Web Technology – A Developer’s Perspective, Prentice Hall of India Private Ltd, New Delhi, Second Edition, 2016.
2. C.Xavier, Web Technology and Design, NEW AGE; First edition, 2018
3. Steven M. Schafer, "HTML, XHTML, and CSS Bible", Wiley Publication, 2011
4. Keith Grant, "CSS in Depth", Manning Publication, 2018.
5. William Alvin Newton, Steven Webber, "Computer Programming JavaScript, Python, HTML, SQL, CSS", Independently Published, 2019.
6. Hasanraza ANSARI, "Learn VBScript", Independently Published, 2021.
7. <https://www.geeksforgeeks.org/web-technology/>

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Understand and apply the webpage concepts.
- Develop static and dynamic web pages
- Understand the feature of JavaScript and VB Script
- Develop knowledge about XML fundamentals and usage of XML technology.
- Understand about the web design with XSL and data validation with DTD.

## PROFESSIONAL ETHICS & HUMAN VALUES

Third Year

**PART - V**  
**SOFT SKILL DEVELOPMENT**  
**(Theory)**

Semester V

Code: 22UGSDC

Credit: 2

### **OBJECTIVES:**

- To develop communicative competence among the Students.
- To enhance the learner's soft skills by giving adequate exposure in LSRW and sub skills.
- To enable learners to put the life skills into practice with confidence.

### **UNIT- I KNOW THYSELF / UNDERSTANDING SELF:**

Introduction to Soft skills - Self discovery - Developing positive attitude - Improving perceptions - Forming values.

### **UNIT -II INTERPERSONAL SKILLS/ UNDERSTANDING OTHERS:**

Interpersonal Skills/ Understanding Others Developing interpersonal relationship –Team building-group dynamics-Networking-Improved work relationship.

### **UNIT -III COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS:**

Art of listening – Art of reading – Art of speaking – Art of writing - Art of writing e – mails e mail etiquette.

### **UNIT- IV CORPORATE SKILLS / WORKING WITH OTHERS**

Oral Presentation – Memos- Note taking - Note making and preparing Minutes- Reports, Proposals, and Abstracts - Technical Writing.

### **UNIT -V SELLING SELF / JOB HUNTING**

Writing resume/cv - interview skills - Group discussion - Mock interview - Mock GD – Goal setting - Career planning

### **Text Books:**

Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success), P.R. Publishers & Distributors, No, B-20 & 21, V.M.M. Complex, Chatiram Bus Stand, Tiruchirappalli-620002.(PhoneNo:0431-2702824: MobileNo:94433 70597,98430 74472)

Alex K. (2012)

Soft Skills – Know Yourself & KnowtheWorld, S. Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

Mobile No: 9442514814 (Dr.K. Alex)

**Reference Books:**

- (i) Developing the leader within you John C. Maxwell
- (ii) Good to Great by Jim Collins
- (iii) The seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can win Shive Khera
- (vi) Principle centred leadership Stephen Covey

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## PROFESSIONAL ETHICS

**Third Year**

**CORE PRACTICAL V  
DIGITAL ELECTRONICS AND MICROPROCESSOR  
LAB**

**Semester V**

**Code: 22SCCCS5P**

**(Practical)**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To have hands-on experience with digital electronics concepts.
- To experiment the design of basic logic circuits, combinational and sequential circuits
- To write ALP and to execute them with a microprocessor kit.

### **A. Digital Electronics Experiments**

1. Verification of Logic gates
2. Construction of half and full adder
3. K-Map
4. Shift register
5. Up Down Counters

### **B. Microprocessor Experiments**

1. Eight Bit Addition and Subtraction
2. Sum of series
3. Data transfer
4. Maximum of N Numbers
5. Decimal to Hexadecimal

### **COURSE OUTCOMES:**

- Upon successful completion of this course the students would be able to:
- Verify the logic gate and the working of Adder and subtractors
- Construct and study the function of Shift registers
- Understand the working of Up Down Counters
- To write simple ALPs and execute them
- To manipulate an array with ALP.

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## PROFESSIONAL ETHICS

**Third Year**

**CORE COURSE VIII  
OPERATING SYSTEMS  
(Theory)**

**Semester VI**

**Code: 22SCCCS8**

**Credit: 5**

### **COURSE OBJECTIVES:**

- To understand the basics of Operating systems and their working
- To Learn and understand operating system services and methods
- To understand the different types of devices connected with Operating systems.

### **UNIT - I:**

Introduction - What Is an Operating System-Operating System Software -A Brief History of Machine Hardware -Types of Operating Systems - Brief History of Operating System Development-Object- Oriented Design

### **UNIT - II:**

Early Systems: Single-User Contiguous Scheme -Fixed Partitions-Dynamic Partitions- Best-Fit versus First-Fit Allocation -Deallocation - Relocatable Dynamic Partitions.Virtual Memory: Paged Memory Allocation-Demand Paging-Page Replacement Policies and Concepts -Segmented Memory Allocation-Segmented/Demand Paged Memory Allocation - Virtual Memory-Cache Memory

### **UNIT - III:**

Overview-About Multi-Core Technologies-Job Scheduling Versus Process Scheduling- Process Scheduler-Process Scheduling Policies-Process Scheduling Algorithms –A Word About Interrupts-Deadlock-Seven Cases of Deadlock -Conditions for Deadlock- Modeling Deadlock-Strategies for Handling Deadlocks – Starvation- Concurrent Processes: What Is Parallel Processing-Evolution of Multiprocessors- Introduction to Multi-Core Processors- Typical Multiprocessing Configurations--Process Synchronization Software

### **UNIT - IV:**

Types of Devices-Sequential Access Storage Media-Direct Access Storage Devices- Magnetic Disk Drive Access Times- Components of the I/O Subsystem- Communication among Devices-Management of I/O Requests

### **UNIT - V:**

The File Manager -Interacting with the File Manager -File Organization – Physical Storage Allocation - Access Methods-Levels in a File Management System – Access Control Verification Module

### **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. Ann McIver Mc Hoes, Ida M. Flynn, "Understanding Operating Systems", Course Technology, Cengage Learning, 2011.
2. Greg Tomsho, "Guide to Operating Systems", Cengage Learning, 2020.
3. Cesar Herrera, Darrell Hajek, Flor Narciso, "Principles of Operating Systems", Amazon Digital Services LLC - KDP Print US, 2020.
4. Cesar Herrera, Darrell Hajek, "Principles of Operating Systems", Independently Published, 2019.
5. Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, "Operating Systems: Three Easy Pieces", Create Space Independent Publishing Platform, 2018.
7. <https://www.guru99.com/os-tutorial.html>

**COURSE OUTCOMES:**

- Upon successful completion of this course the students would be able to:
- Recall the basic principles and importance of the operating system in a computer
- Illustrate the objectives and functions of the operating system components
- Identify the various operating system techniques
- Analyse the issues and challenges of the operating system and security mechanisms
- Evaluate the functions and features of file management in operating systems

## PROFESSIONAL ETHICS

Third Year

**CORE COURSE IX**  
**PROGRAMMING IN PHP**  
(Theory)

Semester VI

Code : 22SCCCS9

Credit: 5

### COURSE OBJECTIVES:

- To understand the basics of PHP and Ajax
- To know about various constructs available in PHP
- To understand and implement the AJAX based dynamic client-server interaction

### UNIT - I:

Essentials of PHP - Operators and Flow Control - Strings and Arrays.

### UNIT - II:

Creating Functions - Reading Data in Web Pages - PHP Browser – Handling Power.

### UNIT - III:

Object-Oriented Programming –Advanced Object-Oriented Programming

### UNIT - IV:

File Handling –Working with Databases – Sessions, Cookies, and FTP

### UNIT - V:

Ajax – Advanced Ajax – Drawing Images on the Server.

### UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

### REFERENCES:

1. Steven Holzner, The PHP Complete Reference, McGraw Hill Education, 2007.
2. Vikram Vaswani, PHP: A Beginner's Guide, McGraw Hill Education, 2008.
3. Don Gosselin, Diana Kokoska, Robert Easterbrooks, "PHP Programming with MySQL", Course Technology, 2010.
4. Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf, " Programming PHP: Creating Dynamic Web Pages", O'Reilly Media, 2013.
5. Alan Forbes, "The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL, Create Space Independent Publishing Platform, 2015.
6. Antonio Lopez, "Learning PHP 7, Packt Publishing, 2016.
7. <https://www.guru99.com/php-tutorials.html>

### COURSE OUTCOMES:

- Upon successful completion of this course the students would be able to:
- Understand the fundamental knowledge of developing web applications with PHP.
- Illustrate the advanced concepts like strings, arrays and functions
- Design Web based applications.
- Analyze and solve various database tasks using PHP.
- Develop AJAX based applications.

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## PROFESSIONAL ETHICS

Third Year

MAJOR BASED ELECTIVE II  
1) SOFTWARE ENGINEERING  
(Theory)

Semester VI

Code: 22SMBECS2A

Credit: 4

### COURSE OBJECTIVES:

- To impart knowledge in the life cycle of software engineering
- To learn about Requirements Analysis Modeling, Basic Issues in Software Design and Software coding
- To acquire exposure in Web Engineering Introduction: Introduction to Software Engineering - Software Process – Software

### UNIT - I:

Process Models - Software Model - Requirements Engineering Principles: Requirements Engineering - Importance of Requirements - Types of Requirements - Steps involved in Requirements Engineering.

### UNIT - II:

Requirements Analysis Modeling: Analysis Modeling Approaches – Structured Analysis - Object Oriented Analysis - Design and Architectural Engineering :Design Process and Concepts - Basic Issues in Software Design – Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System - Modularity, Cohesion, Coupling, Layering - Real Time Software Design - Design Models - Design Documentation.

### UNIT - III:

Object Oriented Concepts: Fundamental Parts of Object Oriented Approach – Data Hiding and Class Hierarchy Creation - Relationships - Role of UML in OO Design -Design Patterns - Frameworks - Object Oriented Analysis – Object Oriented Design - User Interface Design : Concepts of User Interface - Elements of User Interface -Designing the User Interface - User Interface Evaluation – Golden Rules of User Interface Design - User Interface Models – Usability

### UNIT - IV:

Software Coding - Introduction to Software Measurement and Metrics – Software Configuration - Project Management Introduction - Introduction to Software Testing - Software Maintenance

### UNIT - V:

Web Engineering : Introduction to Web - General Web Characteristics – Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering – Web 2.0 - Rapid Delivery - Open Source Software Development - Security Engineering - Service Oriented Software Engineering - Web Service -Software as a Service – Service Oriented Architecture - Cloud Computing – Aspect Oriented Software Development - Test Driven Development - Social Computing

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**  
Contemporary Developments Related to the Course during the Semester Concerned

**REFERENCES:**

1. Chandramouli Subramanian, Saikat Dutt Chandramouli Seetharaman, B.G.Geetha, Software Engineering, Pearson Publications, 2015.
2. Software Engineering, Jibitesh Mishra, Pearson Education, 2011.
3. Ian Sommerville, "Software Engineering", Pearson, 2011.
4. Rod Stephens, "Beginning Software Engineering", Wiley, 2015.
5. Ashfaque Ahmed, Bhanu Prasad, "Foundations of Software Engineering", CRC Press, 2016.
6. Titus Winters, Tom Manshreck, Hyrum Wright, "Software Engineering at Google", O' Reilly Media, 2020.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Recall the various techniques of software process models.
- Understand the requirements for a software project.
- Develop frameworks for software projects.
- Apply the knowledge, techniques, and skills in the development of a software product.
- Make use of web engineering concepts for software development.

## PROFESSIONAL ETHICS

Third Year

**SKILL BASED ELECTIVE II**  
**MOBILE APPLICATION DEVELOPMENT**  
(Theory)

Semester VI

Code: 22SSBECS2

Credit: 2

### COURSE OBJECTIVES:

- To gain a basic knowledge of Android application development
- To understand about user Interfaces for the Android platform.
- To familiarize of the Android Studio development tool.

### UNIT - I:

Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, building your First Android application, Understanding Anatomy of Android Application, Android Manifest file

### UNIT - II:

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions

### UNIT - III:

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation

### UNIT - IV:

Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

### UNIT - V:

Using Common Android APIs: Using Android Data and Storage APIs, managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

**UNIT - VI CURRENT CONTOURS** (for Continuous Internal Assessment Only):  
Contemporary Developments Related to the Course during the Semester Concerned

### REFERENCES:

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2011.
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd, 2010
3. Mark L Murphy, "Beginning Android3", Apress Publications, 2011.
4. Bill Phillips, Chris Stewart, Kristin Marsicano, Brian Gardner, "Android Programming", Big Nerd Ranch, 2019.
5. Barry Burd, John Paul Mueller, "Android Application Development All in one for Dummies", Wiley Publications, 2020.
6. Namrata Bandekar, Darryl Bayliss, Fuad Kamal, "Android Apprentice (Fourth Edition) Beginning Android Development with Kotlin", R R BOWKER LLC, 2021.

**COURSE OUTCOMES:**

- Upon successful completion of this course the students would be able to:
- Identify various concepts of mobile application programming in Android platform
- Implement the business logic in an app with java
- Understand Android User Interface Design with XML
- Know about Common Android APIs
- Deploy applications to the Android marketplace for distribution.

## GENDER, HUMAN VALUES

**Third Year**

**PART - V  
GENDER STUDIES  
(Theory)**

**Semester VI**

**Code: 22UGGS**

**Credit: 2**

### **OBJECTIVES:**

- To make students to aware of Gender constructions and gendering Process
- To explore existing gender biases in the society and to understand the need to work towards the inclusive society
- To inculcate sensitivity and build gender perspectives.
- To use the course to bring attitudinal cum behavioral changes towards gender neutral ambience and promote the humanistic values

### **UNIT- I INTRODUCTION TO GENDER STUDIES CONCEPTS**

Gender Spectrum.-Sex – Gender distinction – Biological Determinism – Patriarchy – Feminism – Gender Socialization and Stereotyping-Gender Discrimination – Gender Division of labour and roles– Gender Sensitivity and awareness – Gender Equity – Equality – Gender Main streaming and Gender Analysis.

### **UNIT- II UGC INITIATIVES ON WOMEN’S STUDIES**

Definition of Women’s Studies –Gender Studies –UGC Initiatives and guidelines on Women’s Studies - Beijing Conference, UN Initiatives – Convention on Elimination of All forms of Discrimination Against Women (CEDAW)- Sustainable Development Goals on Gender Equality (SDG 5) and targets.

### **UNIT- III AREAS OF GENDER DISCRIMINATION**

Gender Socialization- Sex Ratio– Health and Nutrition– – Literacy and Education - Employment- Governance – participation in decision making- politics- property rights and access to credit- gender based violence- Social institutions –Family, Caste, Class, religion, gender, State. Market – Media – Politics – Judiciary

### **UNIT -IV WOMEN DEVELOPMENT AND GENDER EMPOWERMENT**

Towards Equality Report of Status of Women in India 1974 – International Women’s Decade –International Women’s Year –National Policy for Empowerment of Women 2001.

### **UNIT -V WOMEN’S MOVEMENTS AND SAFEGUARDING MECHANISM**

In India National /State Commission for Women(NCW) – All Women Police Station – Family Court Legislations safeguarding women –Transgender Policy—Constitutional amendments for women’s political participation.

**UNIT - VI CURRENT CONTOURS:** (for continuous internal assessment only):

Tamil Nadu State Policy for Women 2021- National Policy for Women 2015 – Prevention of Sexual Harassment at Work places Act 2013-Protection of Children from Sexual Offences Act, 2012 - Analysis of regressive and progressive High court and supreme court judgments- women proactive policies, programmes,interventions.

**References:**

1. Bhasin Kamala, Understanding Gender: Gender Basics, New Delhi: Women Unlimited, 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics, New Delhi: Women Unlimited, 2004
3. Bhasin Kamala, What is Patriarchy?: Gender Basics, New Delhi: Women Unlimited, 1993
4. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.), Family and Gender: Changing Values in Germany and India, New Delhi : Sage Publications, 2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.), Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi : Oxford University Press, 2006
6. Rajadurai. S.V, Geetha.V, Themes in Caste Gender and Religion, Tiruchirappalli : Bharathidasan University, 2007
7. Misra Geetanjali, Chandiramani Radhika (ed.) Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi : Sage Publication, 2005
8. Rao Anupama (ed.), Gender & Caste: Issues in Contemporary Indian Feminism, New Delhi : Kalika Women, 2003
9. Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publication, 2003.
10. Krishna Sumi, (ed.), Livelihood and Gender: Equity in Community Resource Management, New Delhi : Sage Publication, 2004
11. Pludi. Michele (ed.), Praeger Guide to the Psychology of Gender, London: Praeger Publisher, 2004
12. Wharton. S. Amy, The Sociology of Gender : An Introduction to Theory and Research, USA : Blackwell Publishing, 2005
13. Mohanty Manoranjan (ed.), Class, Caste, Gender: Readings in Indian Government and Politics – 5, New Delhi : Sage Publications, 2004.
14. Arya Sadhna Women, Gender Equality and the State, New Delhi: Deep & Deep Publication, 2000
15. Mishra. O.P, Law Relating to Women & Child, Allahabad: Central Law Agency, 2001
16. Chari Leelavathi, Know Your Rights, Madras; Tamil Nadu Social Welfare Board, 1987
17. Bhattacharya Malini, Sexual Violence and Law, Kolkata; West Bengal Commission for Women, 2002
18. Sexual Harassment at the Workplace – A Guide, New Delhi; Sakshi, 1999

**COURSE OUTCOMES:**

- Students would have gained a perspective and understood the social reality of gender society understood the differences of gender and sex and may resort to building alternative perspectives and critical thinking.
- Gained knowledge on the various social institutions governing gender and the intersectionality.
- Exposed to the kind of initiatives of the State towards gender equality.

# PROFESSIONAL ETHICS

**Third Year**

**CORE PRACTICAL VI  
PROGRAMMING IN PHP LAB  
(Practical)**

**Semester VI**

**Code: 22CCCS6P**

**Credit: 4**

## **COURSE OBJECTIVES:**

- To acquire the programming experience in PHP
  - To apply variables, strings, and constants to a PHP a script and test it with a program.
  - To design an authentication web page in PHP with MySQL.
1. Write a program to find the factorial of a number.
  2. Write a program using Conditional Statements need a number N and check whether it is divisible by M.
  3. Write a program to find the maximum value in a given multi-dimensional array.
  4. Write a program to find the GCD of two numbers using user-defined functions.
  5. Design a simple web page to generate multiplication table for a given number.
  6. Design a web page that should compute one's age on a given date.
  7. Write a program to download a file from the server.
  8. Write a program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page.
  9. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
  10. Write a program to design a simple calculator.
  11. Design an authentication web page in PHP with MySQL to check username and password.

## **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- Learn PHP programming on handling strings and arrays.
- Design web pages for different applications with MYSQL
- Handle files, sessions and cookies by downloading a file from the server,
- Develop real-time applications.
- Gain experience in drawing images using Ajax.

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# **PROFESSIONAL ETHICS**

**III YEAR VI SEMESTER  
COURSECODE: 22SMBCSPW  
MAJOR BASED ELECTIVE III - MINI PROJECT**

Students to do Mini Project in their respective Colleges. The objective of the Mini Project is to enable the students to work in convenient groups of not more than four members on a project with a Latest Software.

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M.Sc.,  
ComputerScience

# PROFESSIONAL ETHICS

## CORE COURSE I

### MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE

(Theory)

First Year

Code: P22CSCC11

Credit: 5

Semester I

#### Course Objective:

- Ability to apply mathematical logic to solve problems.
- Understand Propositions, tautologies and inference rules.
- Able to formulate problem and apply test in hypothesis

#### UNIT-I MATRICES:

Determinants, inverse of matrix. System of equations, Linear transformation- rank and nullity, Consistency and inconsistency of linear system of equations, rank nullity theorem, Echelon form of a matrix and Row reduced echelon form of matrix. Eigen values and Eigen vectors.

#### UNIT – II POWER METHOD TO FIND THE DOMINANT EIGEN VALUES, NUMERICAL LINEAR ALGEBRA:

Gauss elimination method, Gauss Jordan Method, Jacobi Method for solving linear systems.

#### UNIT–III SETS:

Operations on sets, Venn Diagrams, Multi Sets, Binary Relations, Equivalence Relations, Ordering Relations, Operations on Relations, Partial Orders. Statements and Notation, Connectives, Quantified Propositions, Logical Inferences, Methods of Proof of an Implication, First Order Logic and other Methods of Proof, Rules of Inference for Quantified Propositions, Proof by Mathematical Induction.

#### UNIT–IV GENERATING FUNCTIONS OF SEQUENCES:

Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations

#### UNIT–V INTRODUCTION TO PROBABILITY:

Random variables - discrete and continuous, probability functions, density and distribution functions, mean and variance, special distributions

(Binomial, Hyper geometric, Poisson, Uniform, exponential and normal). Testing of Hypothesis, Null and alternative hypothesis, level of significance, one-tailed and two tailed tests, tests for small samples- T-test, Chi-square test.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

**References:**

1. Kenneth H. Rosen, “Discrete Mathematics And Its Applications”, 7th Ed, McGrawHill, 2012.
2. Erwin Kreyszig, “Advanced Engineering Mathematics”, Wiley India, 9th Edition 2011.
3. Bernard Kolman, Robert Busby and Sharon Cutler Ross, “Discrete Mathematical Structures for Computer Science”, 6 th Ed, PHI , 2013.
4. Walpole, R. E., Myers, R. H., Myers S L & Keying Ye, ‘Probability and Statistics for Engineers and Scientists’. 8th ed, Pearson Education, 2007.
5. Eric Lehman, F. Thomson Leighton, Albert R. Meyer, “Mathematics for Computer Science”, MIT 7th Ed, 2015
6. William Stein, “Elementary Number Theory: Primes, Congruences, and Secrets”: A Computational Approach Springer, 2008.
7. Sipser, “Introduction to the Theory of Computation, CENGAGE Learning, 2014. 4. Ernest Davis, “Linear Algebra and Probability for Computer Science Applications “, 1st Edition, CRC Press 2012.
8. Tom M. Apostol, “Introduction to Analytic Number Theory”, Springer, 1998.
9. [https://mrcet.com/downloads/digital\\_notes/IT/MATHEMATICAL%20FOUNDATIONS%20OF%20\(R17A0503\).pdf](https://mrcet.com/downloads/digital_notes/IT/MATHEMATICAL%20FOUNDATIONS%20OF%20(R17A0503).pdf)
10. <https://stattrek.com/tutorials/probability-tutorial>
11. [https://www.tutorialspoint.com/discrete\\_mathematics/discrete\\_mathematics\\_sets.htm](https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematics_sets.htm)
12. <https://repositorio.uci.cu/jspui/bitstream/123456789/9433/1/Mathematical%20Foundation%20of%20Computer%20Science%20%28%20PDFDrive%20%29.pdf>

**Course Outcomes:**

On successful completion of this course, students will be able to:

- Apply the basis of the mathematical applications.
- Apply iterative methods (Gauss Jordan, Gauss Elimination and Jacobi) to solve systems of linear equations.
- Understand Propositions, tautologies and inference rules.
- Use sets and operations on sets.
- Formulate problems and apply test in hypothesis.

# PROFESSIONAL ETHICS

## CORE COURSE II

### PROBLEM SOLVING USING PYTHON AND R (Theory)

**First Year**

**Code: P22CSCC12**

**Semester I**

**Credit: 5**

#### **Course Objectives:**

- To understand Computational thinking using Python.
- To develop simple Python programs for solving problems.
- To make students exercise the fundamentals of statistical analysis in R environment.

#### **UNIT – 1 INTRODUCTION TO PYTHON:**

Introduction–Python overview–Getting started–Comments–Python identifiers – Reserved keywords–Variables–Standard datatypes–Operators–Statements and Expressions–String operations–Boolean expressions. Control Statements: The for loop–while statement–if-elif-else statement–Input from keyboard. Functions: Introduction–Built-in functions– User defined functions–Function Definition– Function Call - Type conversion – Type coercion – Python recursive function.

#### **UNIT – II STRINGS:**

Strings –Compound data type – len function – String slices –String traversal– Escape characters–String formatting operator–String formatting functions. **Tuples:** Tuples– Creating tuples–Accessing values in tuples–Tuple assignment – Tuples as return values – Basic tuple operations – Built-in tuple functions. **Lists:** Values and accessing elements – Traversing a list – Deleting elements from list –Built-in list operators & methods. **Dictionaries:** Creating dictionary – Accessing values in dictionary – Updating dictionary – Deleting elements from dictionary – Operations in dictionary - Built-in dictionary methods.

#### **UNIT–III FILES AND EXCEPTIONS:**

Introduction to File Input and Output-Writing Structures to a File-Using loop to process files Processing Records - Exception. Classes and Objects in Python: Overview of OOP – Data encapsulation –Polymorphism–Class definition– Creating objects – Inheritance – Multiple inheritances – Method overriding – Data encapsulation – Data hiding.

#### **UNIT–IV DATA MANIPULATION TOOLS & SOFTWARES:**

Numpy: Installation - Narray - Basic Operations -Indexing, Slicing, and Iterating-Shape Manipulation - Array Manipulation - Structured Arrays -Reading and Writing Array Data on Files. **Pandas:** The pandas Library: An Introduction - Installation - Introduction to pandas Data Structures - Operations between Data Structures-Function Application and Mapping-Sorting and Ranking- Correlation and Covariance—Not a Number Data-Hierarchical Indexing and

Leveling – **Reading and Writing Data:** CSV or Text File - HTML Files - Microsoft Excel Files.

## **UNIT–V PROGRAMMING WITH R:**

Variables- Vector, matrix, arrays – List – Data Frames – Functions– Strings – Factors – Loops – Packages –Date and Time – Files - Making packages

## **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **References:**

1. Python:The Complete Reference, Matrin C Brown,McGraw-Hill,2018.
2. Python Programming a Modular Approach withGraphics,Database,Mobile,and Web Applications – SheetalTaneja, Naveen Kumar – Pearson Publication, 2018.
3. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, Wes McKinny, 2nd Edition,O’Reilly Media, 2017.
4. DataAnalytics Using Python,BhartiMotwani,Wiley,2020
5. RichardCotton,“LearningR”,O’Reilly,2013
6. PythonforEverybody:ExploringDataUsingPython3,Dr.CharlesR.Severance, 2016.
7. EBalagurusamy, —Introduction tocomputing andproblem solving using Python, McGraw Hill Publication,2016.
8. MarkSummerfield,ProgramminginPython3:ACompleteIntroductiontothe Python Language, 2nd Ed.,Addison-Wesley Professional, 2010.
9. MarkLutz,—LearningPython,5thEd.,2013.
10. WelseyJ.Chun,—CorePythonProgramming,PrenticeHall,2001
11. <https://realpython.com/python-practice-problems/>
12. <https://freepdf-books.com/impractical-python-projects-playful-programming-activitiesto-make-yousmarter-book-of-2019/>
13. <https://freepdf-books.com/fundamentals-of-python-first-programs-second-editionbook-of-2019>
14. <https://docs.python.org>
15. <https://www.learnpython.org/>
16. <https://www.javatpoint.com/python-tutorial>
17. <https://www.tutorialspoint.com/r/index.htm>

### **Course Outcomes:**

On successful completion of this course,students will be able to:

- Write Python programs using Python data structures
- Develop object oriented programs in Python
- Manipulate files using Python
- Apply the Python libraries NumPy and Pandas for problem solving
- Write R programs for data visualization.

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**CORE CHOICE COURSE  
WEB TECHNOLOGIES (Theory)**

**First Year**

**Semester I**

**Code : P22CSCC1B**

**Credit: 4**

**Course Objectives:**

- To provide fundamental concept of Internet, JavaScript, XML, JSP, ASP with a view to developing professional software development skills.
- To make familiar with client server architecture.
- To get project-based experience needed for entry into web application and development careers.

**UNIT– I INTERNET BASICS:**

Basic Concepts – Internet Domains – IPAddress – TCP/IPProtocol – The WWW – The Telnet —Introductionto HTML:Webserver - Webclient/browser - Tags – Text Formatting – Lists – Tables –LinkingDocuments-Frames.

**UNIT– II JAVASCRIPT:**

JavaScript in Web Pages – The Advantages of JavaScript –Writing JavaScript into HTML – Syntax – Operatorsand Expressions – Constructs and conditional checking – Functions – Placing text in a browser – DialogBoxes – Formobject’smethods – Built in objects – user defined objects.

**UNIT– III XML:**

Comparison with HTML – DTD – XML elements – Content creation –Attributes – Entities – XSL – XLINK – XPATH – XPOINTER – Namespaces –Applications – integrating XML with other applications.

**UNIT– IV JSP FUNDAMENTALS:**

Basics – Directive basics – Page directive – The taglib directive – The include directive – JSP Standard Actions – Java Beans –Error Handling.

**UNIT – V ASP:**

Introduction to ASP – Objects – Components – Working with HTML forms – Connecting to Microsoft SQL Server& MS–Access Database – SQL statements with connection object – Working with record sets.

## **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **References:**

1. “Web Enabled Commercial Application Development Using HTML,DHTML,JavaScript, Perl CGI”, Ivan Bayross, BPB Publication.
2. “XMLBible”,ElliotteRustyHarold,2ndEdition,WroxPublication.
3. “BeginningJavaServerPages”,VivekChopra,SingLi,RupertJones,Jon Eaves,John T. Bell,Wrox Publications.
4. “PracticalASP”,IvanBayross,BPBPBPublication
5. Crouch Matt J, “ASP.NET and VB.NET Web Programming”, Addison Wesley2002.
6. J.Liberty, D.Hurwitz, “Programming ASP.NET”, Third Edition, O’REILLY,2006.
7. <https://www.geeksforgeeks.org/web-technology/>
8. <https://study.com/academy/lesson/what-is-web-technology-definition-trends.html>

### **Course Outcomes:**

On the successful completion of this course,Students will be able to:

- Design a web page with Web form fundamentals and web control classes
- Recognize the importance of validation control,cookies and session
- Apply the knowledge of ASP.NET object, ADO.NET data access and SQL todevelop a client server model.
- Recognize the difference between Data list and Data grid controls in accessing data.
- Know the code optimization techniques; Understand the techniques of Internet, JavaScript, XML, JSP, ASP with a view to developing professional software development skills.

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## PROFESSIONAL ETHICS

### Core Elective I MICROPROCESSOR AND MICROCONTROLLERS (Theory)

First Year  
Code: P22CSE1B

Semester I  
Credit: 4

#### Course Objective:

- To realize the 8086 Microprocessor Architecture, Operations, Programming,
- To understand the basics of advanced Microprocessors and 8051 with 80196 Microcontroller.
- To develop the assembly language programming.

#### UNIT – I 8086 ARCHITECTURE, PIN CONFIGURATION & TIMING DIAGRAM:

Register Organization of 8086–Architecture–Signal Description–Minimum Mode 8086 System and Timings –Maximum Mode8086 System and Timings– The 8088 Architecture–Pin configuration-Comparisonof8086and8088.

#### UNIT – II 8086 ADDRESSING MODES, INSTRUCTION SET AND ASSEMBLER DIRECTIVES:

Machine Language Instruction Formats-Addressing Modes of 8086-**Instruction Set of 8086:**Data Transfer Instructions – Arithmetic Instructions – LogicalInstructions – Rotate Instructions – Shift Instructions – Branch Instructions–Flag Manipulation and Processor Control Instructions – String Instructions – Interrupts and Interrupt Service Routines–Assembler Directives and Operators –#Programming with an Assembler.

#### UNIT–III 8086 ASSEMBLY LANGUAGE PROGRAMMING:

Addition, Subtraction, Multiplication and Division –Multi-byte Addition and Subtraction – Complements – Shifting – Masking – Sum of a Series –Block of Data Transfer–Finding the Smallest and the Biggest Number in an Array–Arranginga Series of Numbers in Ascending and Descending Order – Length of a String – Numberof OccurrencesofaCharacterinaString–ComparisonofTwoStrings

#### UNIT–IV 80286 ARCHITECTURE:

80286 Architecture – Salient features of 80286 – Signal description of80286– 80286 bus interface – basic bus operations of 80286–80386 architecture– salient features of 80386 – addressing modes of 80386 – register organization of 80386 – data types of 80386 – Protected and virtual mode of 80386 - Pentium Microprocessor – Architecture – Instruction set of Pentium – Intel MMX – MMX architecture – MMX instruction set - PentiumPro and PentiumIIfeatures.

## **UNIT–V MICROCONTROLLER 8051 ARCHITECTURE:**

Architecture of 8051– Signal Descriptions of 8051- Register Set of 8051 – Important Operational Features of 8051 – Memory and I/O Addressing by 8051# – Interrupts of 8051-Instruction Set of 8051 – Intel 16-bit Microcontroller - 80196–80196 architecture – Register set of 80196 – General features of 80196.

## **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. A.K. Ray, K.M. Bhurchandi, *Advanced Microprocessors and Peripherals*, TMH Publications, Third Edition, 2013. **UNIT I** : Chapter-1 Section (1.1-1.3, 1.8- 1.10) **UNIT II** : Chapter-2 Section (2.1-2.4) Chapter-3 Section (3.3), Chapter-4 Section (4.3) **UNIT III**: Chapter-3 Section (3.4) **UNIT IV**: Chapter– 9 Section (9.1 -9.3, 10), Chapter (10.2–10.5, 10.7. 10.10), Chapter (11.1-11.3, 11.5–11.7, 11.10, 11.12) **UNIT V**: Chapter-17 Section (17.2-17.8, 17.11)
2. Badri Ram, *Fundamentals of Microprocessors and Microcomputers*, Fifth Revised and Enlarged Edition, Dhanpat Rai Publications, 2003.
3. K.Meena, *Principles of Digital Electronics*, Prentice Hall of India Pvt. Ltd.. NewDeihl. 2009. (ISBN :978 - 81 - 203 - 3270 • 6)
4. <https://www.eletimes.com/microprocessor-vs-microcontroller-what-is-the-difference#>
5. <https://www.guru99.com/difference-between-microprocessor-and-microcontroller.html>
6. [https://www.tutorialspoint.com/microprocessor/microcontrollers\\_overview.htm](https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm)

### **COURSE OUTCOMES:**

On completion of the course the student will be able to:

- Compare the architectures of Microprocessor and Microcontrollers;
- Differentiate the technologies associated with presentation and interaction services in 8051 with 80196.
- Distinguish and analyze the properties of Microprocessors & Microcontrollers.
- Analyze the data transfer in formation through serial & parallel ports.
- Get knowledge about Microcontrollers.

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# PROFESSIONAL ETHICS

## Value Added Course I Security in Computing (Theory)

**First Year**

**Code: P22CSVAC1**

**Course Objectives:**

- Underst and various threats
- Understand Security in operatingsystems,database and networks
- Identify different tools

**Semester I**

**Credit: 2**

### **UNIT–I INTRODUCTION AND BASIC CONCEPTS:**

Threats, vulnerabilities, controls; risk; Breaches; confidentiality, integrity, availability; Attacks, Exploits. Information Gathering (Social Engineering, Foot Printing & Scanning). Open Source/ Free/ Trial Tools: nmap, zenmap, Port Scanners, Network scanners.

### **UNIT–II EXPLANATION O FMALWARE,TYPES OF MALWARE:**

Virus, Worms, Trojans, Rootkits, Robots, Adware's, Spywares, Ransom wares, Zombiesetc., MalwareAnalysis.OpenSource/Free/TrialTools: AntivirusProtection, Anti Spywares, System tuning tools, AntiPhishing.

### **UNIT – III SECURITY IN CONVENTIONAL OPERATING SYSTEMS:**

Memory, time, file, object protection requirements and techniques Identification and authentication. Trusted operating systems.

### **UNIT– IV DATABASE MANAGEMENT SYSTEMS SECURITY:**

Database integrity,Database secrecy,Inference control,Multilevel databases.

### **UNIT–V NETWORK SECURITY:**

Network threats leaves dropping, spoofing, modification, denial of service attacks, Introduction to network security techniques: firewalls, intrusion detectionsystems. Cyber crimes and control measures.

### **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, Security in Computing”, 5th Ed, Prentice Hall, 2015.
2. Michael E. Whitman, ‘Information Security: Incident Response and Disaster Recovery’, Cengage Learning, 2009
3. W.M. Arthur Conklin, Gregory B. White, Chuck Cothen, Dwayne Williams, Roger Lavis, “Principles of Computer Security”, 4th Ed, Mc Graw Hill 2016
4. <https://www.w3schools.com/cybersecurity/index.php>
5. <https://www.javatpoint.com/cyber-security-tools>

### Course Outcomes:

- Understand the basic concept so information security—Threats, Vulnerabilities and Controls
- Examine various malwares and program flaws
- Compare Security enabled unconventional and trusted operating systems.
- Understand various security measures in database management systems
- Gain knowledge on network threats and security techniques.

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## PROFESSIONAL ETHICS

**First Year**

**CORE PRACTICAL I  
PROBLEM SOLVING USING PYTHON  
AND R  
(Practical)**

**Semester I**

**Code: P22CSCC1P**

**Credit:2**

(a). Implement the following concepts using Python

1. Decision Making and Looping statements.
2. Function Definition & Functioncall.
3. Create and Access Lists.
4. Built-In Tuple Functions.
5. Create and Access Dictionaries.
6. Files and Exceptions.

(b). Implement the following concepts using R

1. Loops with different examples.
2. Implement dataframes in R.
3. Implement different data structures in R(Vectors,Lists,DataFrames)
4. Write a program to read a csv file and analyze the data in the file
5. Create piecharts and bar charts using R.

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## PROFESSIONAL ETHICS

**First Year**

**CORE CHOICE PRACTICAL I  
2) WEB TECHNOLOGIES**

**Semester I**

**Code: P22CSCC1B**

**(Practical)**

**Credit: 2**

1. Write a XML program for job listing in HTML.
2. Write a JavaScript code block, which checks the contents entered in a form's text element. If the text entered is in the lower case, convert to upper case.
3. Write a Java Script code block, which validate as username and password.
  - a) If either the name or password field is not entered display an error message.
  - b) The field entered do not match with default values display an error message.
  - c) If the field entered match, display the welcome message.
4. Write a Java Script code to display the current date and time in a browser.
5. Write a JSP Program for user authentication.
6. Write a JSP Program for a simple shopping cart.
7. Write a JSP Program to prepare a bio data and store it in database.
8. Write an ASP Program using Response and Request Object.
9. Write an ASP Program using AdRotator Component.
10. Write an ASP program using database connectivity for student's record

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## PROFESSIONAL ETHICS

**First Year** **CORE COURSE III** **Semester II**  
**ADVANCED DATA BASE MANAGEMENT**  
**SYSTEM**  
**Code: P22CSCC21** **(Theory)** **Credit: 5**

### Course Objectives:

- Underst and Relational Model
- Get knowledge about SQL as well as NoSql
- Underst and transaction management

### UNIT–I INTRODUCTION:

Database System Applications – Purpose of Database Systems -View of Data – Database Languages - Relational Databases – Database Design - Data Storage and Querying - Transaction Management, Database Architecture-Database Users and Administrators

### UNIT–II RELATIONAL MODEL:

Structure of Relational Database - Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations- Design Phases – Pitfalls in Design – Attribute types – ER diagram – Database Design for Banking Enterprise – Functional Dependence – Normalization (1NF, 2NF, 3NF, BCNF, 4NF, 5NF).

### UNIT–III INTRODUCTION TO SQL:

SQL Data Definition, Basic Structure of SQL Queries - Additional Basics Operations, Set Operations-Null Values, Aggregate Functions-Nested Subqueries, Modification of the Database **Intermediate SQL:** Join Expression, Views - Transactions, Integrity Constraints- Data Types and Schemas, Authorization **Advanced SQL:** Accessing SQL from Programming Language, Functions and Procedures, Triggers

### UNIT–IV TRANSACTIONS AND RECOVERY:

Transactions: Transaction Concept – Simple Transaction Model – Storage Structure - Transaction Atomicity and Durability. Transaction Isolation – Serializability - Transaction Isolation and Atomicity – Transaction Isolation Levels – Implementation of Isolation Levels – Transactions as SQL Statements Recovery Systems: Failures Classification – Storage Recovery and Atomicity – Recovery Algorithm Buffer Management – Failure with Loss of Nonvolatile Storage -Early Lock Release and Logical Undo Operations-Remote Backup Systems

## **UNIT–V NOSQL DATA BASE AND BIG DATA STORAGE SYSTEM:**

Introduction to NoSQL Systems - The CAP Theorem - Document Based NoSQL Systems and MangoDB - NoSQL key value Stores – Column based or Wide Column NoSQL Systems - NoSQL graph Databases and Neo4j

## **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **References:**

1. Database System Concepts,6/e,AviSilberchartz,HenryF.KorthandS.Sudarshan ,McGraw–Hill Higher Education,International Edition,2013.
2. Ramesh Elmasriand Shamkant B.Navathe, Fundamentals of Database Systems,7thEdition,Pe arson,NewDelhi,2016
3. Database Principles, 2/e, Peter Rob, Carlos Coronol, Steven A.Morris, KeeleyCrockett, Cengage Learning, 2013
4. Database System Concepts, PeterRob, CarlosCoronel, Cengage Learning,2008.
5. Database Development and Management, Lee Chao,Auerbach Publications,2010
6. NoSQL Distilled:A Brief Guide to the Emerging World of Polyglot Persistence, Sadalage, P. &Fowler, Pears on Education, 2013
7. Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement,1stEdition,LucPerkins,EricRedmond,etal.O'ReilleyPublishe rs,2018
8. <https://www.javatpoint.com/dbms-normalization>
9. <https://www.mongodb.com/nosql-explained>
10. <https://www.geeksforgeeks.org/database-recovery-techniques-in-dbms/>

### **Course Outcomes:**

- Revise the components, functions and various database Design techniques used for modelling the databases management system.
- Examine the clauses and functions of SQL and write optimal queries in the above languages.
- Design entity-relationship diagrams to represent simple Database application scenarios and can apply the database schema Normalization rules and techniques to criticize and improve the data base design.
- Analyze the concept of transaction processing, concurrent transaction processing and recovery procedures.
- Employ the NoSQL database concepts

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# PROFESSIONAL ETHICS

**FirstYear**

**CORE COURSE IV  
COMPILER DESIGN  
(Theory)**

**Semester II**

**Code: P22CSCC22**

**Credit: 5**

## **Course Objectives:**

- Define the design and intrinsic functioning of compilers
- Identify the purpose and functions of phases of the compiler
- Describe the Contents and data structure for Symbol table with errors

## **UNIT – I INTRODUCTION TO COMPILERS:**

Compilers - Analysis - Synthesis model of compilation - Analysis of the source program - The phases of a compiler - Cousins of the compiler - Compiler construction tools - Error handling.

## **UNIT – II LEXICAL ANALYZER:**

Lexical analysis - Role of lexical analyzer - Tokens, Patterns and lexemes - Input buffering - Specification of tokens - Regular expressions - Recognition of tokens - Transition diagrams - Implementing a transition diagram - Finite Automata - Regular expression to NFA - Conversion of NFA to DFA

## **UNIT – III SYNTAX ANALYZER:**

Syntax analysis - Role of parser - Context-free grammars - Derivations - Writing a grammar - Top Down parsing - Recursive descent parsing - Predictive parsers - Non-recursive predictive parsers - Construction of predictive parsing tables - Bottom up parsing - Handles - Shift reduce parser - Operator precedence parsing - LR parsers - Canonical collection of LR(0) items - Constructing SLR parsing tables.

## **UNIT – IV INTERMEDIATE CODE GENERATION:**

Intermediate code generation - Intermediate languages - Graphical Representation - Three Address Code – Assignment statements - Boolean expressions - Flow of Control Statements – Case Statements - Syntax directed translation of case statements

## **UNIT – V CODE OPTIMIZATION AND CODE GENERATION:**

An Organization for an Optimizing Compiler - the Principle sources of optimization - Function Preserving Transformations - Common Subexpression - Copy propagation - Optimization of basic blocks - The use of Algebraic identities Loops in flow graphs - Code generation - issues in the design of a code generator - The target machine.

## **UNIT–VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **References:**

1. "Compilers : Principles, Techniques, and Tools", Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Second Edition, Pearson Addison Wesley, 2007.
2. Compiler Construction Principles and Practice – D.M.Dhamadhere, McMillan India Ltd., Madras, 1983.
3. Alfred V. Aho, Ravi Sethi and Jeffrey D. Ullman, "Compilers, Principles, Techniques and Tools", Addison Wesley Longman (Singapore Pvt. Ltd.), 2011.
4. Alfred V. Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Addison Wesley, 1988.
5. David Galles, "Modern Compiler Design", Pearson Education, 2008

### **Course Outcomes:**

On completion of the course, students will be able to

- Understand the fundamental so compiler.
- Get knowledge about the context-free grammars and various parsing techniques.
- Understand the lexical ana lyzer and syntax analyzer of Compiler.
- Underst and the types and sources of errors, from the compilers perspective.
- Know the procedure sand principles involved in the machine code generation.

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# PROFESSIONAL ETHICS

First Year

## CORE CHOICE COURSE II 1) DISTRIBUTED TECHNOLOGIES

Semester II

Code: P22CSCC2A

(Theory)

Credit: 4

### Course Objectives:

- To provide ideas to be able to compare the architectures of distributed systems;
- To know the art of developing ASP.NET pages with webserver and HTML controls;
- To become familiar with the disconnected data access technology in ADO.NET.

### UNIT-I OVERVIEW OF DISTRIBUTED COMPUTING:

Introduction to distributed Computing – Challenges involved in establishing remote connection – Strategies involved in remote computation – Current Distributed computing practices through Dot Net and Java technologies - Client server architecture: 2-tier model - 3-tier model - n-tier model.

### UNIT-II ARCHITECTURE AND JAVA BEANS:

J2EE architecture – DOT NET architecture - MVC Architecture – JavaBeans – Enterprise Java Beans – Distributed Object models – RMI – XML-JSP.

### UNIT-III ADVANCED ASP.NET:

AdRotator, Multiview, Wizard and Image MapControls – Master Pages – Web Parts - Security in ASP, NET – State Management in ASP, NET – Mobile Application development in ASP. NET- Uses of these controls and features in Website development.

### UNIT-IV ADVANCED ADO.NET:

Disconnected Data Access – Grid view, Details View, Form View controls – Crystal Reports – Role of ADO.NET in Distributed Applications.

### UNIT-V WEB SERVICES:

Role of Web services in Distributed Computing – WSDL, UDDI, SOAP concepts involved in Web Services – Connected a WebService to a Data Base – Accessing a Web Service through ASP.NET application.

### UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned

## References:

1. Walther, ASP.NET 3.5, SAMSPublication, 2008.
2. Justin Couch, Daniel H. Steinberg, "J2EE Bible", Wiley India(P) Ltd, New Delhi, 2002
3. PlattSDavid, "Introducing Micorsoft.Net", PrenticeHallofIndia, New Delhi, 2005.
4. PaulTremblett, "Instant Enterprise Javay-Beans", TataMcGrawHill Publishing Company, New Delhi, 2001
5. Stephanie Bodoff, Dale Green, Eric Jendrock, "The J2EE tutorial", Addison-Wesley, 2002
6. HiteshSeth, "Microsoft.NET:kickstart", SamsPublishing, 2004
7. K.Meena, R.Sivakumar, A.B.Karthlck Anand Babu, Dot Net Technologies, Himalaya Publishing House Pvt., Ltd., Bangalore, 2016, (ISBN:978 -93-5037-938-9)

## CourseOutcomes:

On completion of the course the student will be able to:

- Compare the architectures of distributed systems;
- Differentiate the technologies associated with presentation and interactionservices;
- Have sound knowledge in developing applications with components;
- Understand the art of developing ASP.NET pages with web server and HTMLcontrols;
- Become familiar with the disconnected data access technology in ADO.NET.

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## PROFESSIONAL ETHICS

**FirstYear**

**ELECTIVE COURSE II**  
**3) GREEN COMPUTING**  
**(Theory)**

**Semester II**

**Code: P22CSE2C**

**Credit: 4**

### **UNIT– I FUNDAMENTALS:**

Green IT Fundamentals: Business, IT, and the Environment – Green computing: carbon foot print, scoop on power– Green IT Strategies: Drivers, Dimensions, andGoals– EnvironmentallyResponsibleBusiness:Policies, Practices, and Metrics.

### **UNIT– II GREEN ASSETS AND MODELING:**

Green Assets: Buildings, Data Centres, Networks, and Devices – Green Business Process Management: Modeling, Optimization, and Collaboration–Green Enterprise Architecture – Environmental Intelligence – Green Supply Chains – Green Information Systems: Design and Development Models.

### **UNIT– III GRID FRAME WORK:**

Virtualization of IT systems – Role of electric utilities, Telecommuting, teleconferencing and teleporting – Materials recycling – Best ways for Green PC – Green Data centre – Green Grid framework.

### **UNIT – IV GREEN COMPLIANCE:**

Socio-cultural aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future.

### **UNIT – V CASE STUDIES:**

The Environmentally Responsible Business Strategies (ERBS)– CaseStudy Scenarios for Trial Runs – Case Studies – Applying Green IT Strategies and Applications to a Home,Hospital,Packaging Industry and TelecomSector.

### **UNIT–VI CURRENT CONTOURS( For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

## References:

1. Bhuvan Unhelkar, —Green IT Strategies and Applications-Using Environmental Intelligence, CRC Press, June 2014.
2. Woody Leonhard, Katherine Murray, —Green Homecomputing for dummies, August 2012.
3. AlinGales,MichaelSchaefer,MikeEbbers,—GreenDataCentre:stepsfor the Journey, Shroff/IBM rebook, 2011.
4. JohnLamb,—TheGreeningofIT,PearsonEducation,2009.
5. Jason Harris, —GreenComputing and Green IT- Best Practices on regulations & industry, Lulu.com, 2008
6. Carl speshocky, —Empowering Green Initiatives with IT, John Wiley & Sons, 2010.
7. WuChunFeng(editor),—Greencomputing:LargeScaleenergyefficiency, CRC Press

## Course Outcomes:

- Understand Green IT fundamentals
- Get knowledge about green assets and models
- Understand Gridframework
- Know the green compliance
- Know the ERBS concepts.

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## PROFESSIONAL ETHICS

**First Year**

**CORE PRACTICAL II  
ADVANCED DATA BASE MANAGEMENT  
SYSTEM  
(Practical)**

**SemesterII**

**Code: P22CSCC2P**

**Credit: 2**

Implement the following Concepts:

- Tables Creations,Sorting,Settingrelation between tables
- Queries using single and multiple tables
- ExceptionHandling
- Cursor and Triggers
- Import & ExportTables
- Indexing and QueryProcessing
- Reports

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## PROFESSIONALETHICS

**First Year**

**CORE CHOICE PRACTICAL II  
DISTRIBUTED TECHNOLOGIES**

**Semester II**

**Code: P22CSCC2AP**

**Credit: 2**

**(Practical)**

**List of Programs:**

1. RMI application with a server and more than one client.
2. RMI application with DatabaseConnectivity
3. Webpages using JSP Scriptlet.
4. Web page using JSP of javabeans.
5. Performing XML transformation using XMLandXSLcoding.
6. Create XML Schema.
7. Creation of a table and insertionof a few records using Disconnected Access.
8. Viewing records using GridView,Details View, FormView Controls.
9. Generation of a crystal report from an existing database.
10. Webpage that uses of AdRotator Control.

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## REFERENCES :

1. History of Indian Cinema – Renu Saran, Diamond Pocket Books Pvt Ltd, 2014.
2. The History of Cinema for Beginners – Jarek Kupsc, Orient Black Swan, 2015
3. Film Art An Introduction – David K. Bordwell and Kristen Thompson, McGraw Hill, 2008.
4. Film Studies An Introduction- Ed Sikov, Columbia University Press, 2000.
5. Anatomy of Film – Bernard Dick, Bedford, St. Martin's, 2000.
6. Film Studies: The Basics – Amy Villarejo, Routledge, 2007.
7. An Introduction to Film Studies – Jill Nelmes, Routledge, 2003
8. Sound for Film and Television - Tomlinson Holman, Routledge, 2010.
9. Film Production Technique – Bruce Mamer, Wadsworth, 2009.
10. Changing Trends of Indian Cinema – Susmita Bala, Kanishka Publishers, 2019.
11. <http://www.elementsofcinema.com/editing/ellipsis.html>
12. <http://www.filmsound.org/>

## COURSE OUTCOMES:

Upon the successful completion of this course, students would be able:

- To acquire an overview of history and origin of films
- To understand the nuances of various film genres.
- To understand the film production process and various departments involved in making a film
- To understand the importance of technical dimensions in a film.
- To observe the changes in film aesthetics and evolving trends in film industry.

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## PROFESSIONAL ETHICS

Second Year

### CORE COURSE V BIG DATA ANALYTICS

Semester III

Code: P22CSCC31

(Theory)

Credit: 5

#### COURSE OBJECTIVE:

1. To impart knowledge in Fundamentals of BigData Analytics.
2. To make aware of technologies and databases.
3. To impart knowledge on Hadoop and MapReduce Fundamentals

#### UNIT– I INTRODUCTION TO BIG DATA:

Data, Characteristics of data and Types of digital data: Unstructured, Semi- structured and Structured, Sources of data, Working with unstructured data, Evolution and Definition of big data, Characteristics and Need of big data, Challenges of big data, Data environment versus big data environment

#### UNIT– II BIGDATA ANALYTICS:

Overview of business intelligence, Data science and Analytics, Meaning and Characteristics of big data analytics, Need of big data analytics, Classification of analytics, Challenges to big data analytics, Importance of bigdata analytics, Basic terminologies in big data environment

#### UNIT– III BIGDATA TECHNOLOGIES AND DATA BASES:

Introduction to NoSQL, Uses, Features and Types, Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache cassandra and its needs, Characteristics of Cassandra

#### UNIT–IV HADOOP FOUNDATION FOR ANALYTICS:

History, Needs, Features, Key advantage and Versions of Hadoop, Essential of Hadoop ecosystems, RDBMS versus Hadoop, Key aspects and Components of Hadoop, Hadoop architectures

#### UNIT– V MAPREDUCE AND YARN FRAME WORK:

Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Components, Need and Challenges of YARN, Dissecting YARN, MapReduce application, Data serialization and Working with common serialization formats, Big data serialization formats

#### UNIT– VI CURRENT CONTOURS(For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

1. Seema Acharya and Subhashini Chellappan,“Big Data and Analytics”,Wiley India Pvt. Ltd., 2016
2. “BigData”by Judith Hurwitz,Alan Nugent,Dr.Fern Halper and Marcia Kaufman, Wiley Publications, 2014.
3. “Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics” by Soumendra Mohanty, Madhu Jagadeesh and Harsha Srivatsa, Apress Media, Springer Science + Business Media New York, 2013
4. Mining of Massive Datasets”, Anand Rajaraman, Jure Leskovec, Jeffery D. Ullman, Springer, July 2013.
5. “Hadoop:The definitive Guide”,TomWhite,O'Reilly Media,2010.
6. <https://www.techtarget.com/searchbusinessanalytics/definition/big-data-analytics>
7. [https://www.sas.com/en\\_us/insights/analytics/big-data-analytics.html](https://www.sas.com/en_us/insights/analytics/big-data-analytics.html)

## COURSE OUTCOMES:

Upon completion of the course,the student are expected to:

- Understand the bigdata environment.
- Understand the concepts of analytics
- Understand the unstructured databases.
- Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analytics.
- Reveal the MapReduce technologies.

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# PROFESSIONAL ETHICS

Second Year

**CORE COURSE VI**  
**ARTIFICIAL INTELLIGENCE AND**  
**MACHINE LEARNING**  
(Theory)

Semester III

Code: P22CSCC32

Credit:5

## **COURSE OBJECTIVES:**

1. Understand the problem-solving methods using state space search
2. Apply the formal knowledge representation and reasoning for a problem
3. Implement and apply the supervised and unsupervised machine learning algorithms

## **UNIT- I INTRODUCTION TO MACHINE LEARNING:**

Introduction ,Components of Learning , Learning Models , Geometric Models, Probabilistic Models, Logic Models, Grouping and Grading, Designing a Learning System, Types of Learning, Supervised, Unsupervised, Reinforcement, Perspectives and Issues, Version Spaces, PAC Learning, VC Dimension.

## **UNIT- II SUPERVISED AND UNSUPERVISED LEARNING:**

Decision Trees: ID3, Classification and Regression Trees, Regression: Linear Regression, Multiple Linear Regression, Logistic Regression, Neural Networks: Introduction, Perception, Multilayer Perception, Support Vector Machines: Linear and Non-Linear, Kernel Functions, K Nearest Neighbors. Introduction to clustering, K-means clustering, K-Mode Clustering.

## **UNIT-III ENSEMBLE AND PROBABILISTIC LEARNING:**

Model Combination Schemes, Voting, Error-Correcting Output Codes, Bagging: Random Forest Trees, Boosting: Adaboost, Stacking. Gaussian mixture models - The Expectation-Maximization (EM) Algorithm, Information Criteria, Nearest neighbour methods - Nearest Neighbour Smoothing, Efficient Distance Computations: the KD-Tree, Distance Measures.

## **UNIT- IV REINFORCEMENT LEARNING AND EVALUATING HYPOTHESES:**

Introduction, Learning Task, QLearning, Non deterministic Rewards and actions, temporal-difference learning, Relationship to Dynamic Programming, Active reinforcement learning, Generalization in reinforcement learning. Motivation, Basics of Sampling Theory: Error Estimation and Estimating Binomial Proportions, The Binomial Distribution, Estimators, Bias, and Variance

## **UNIT - V INTRODUCTION OF AI:**

Definition of AI- AI Problems– Underlying Assumption – AI technique – Level of the Model – Criteria for Success. Problems, Problem Spaces, Search: Defining the Problem as State Space Search - Production Systems - problem Characteristics – Production System Characteristics

## UNIT– VI CURRENT CONTOURS(For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned

### REFERENCE BOOKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Prentice Hall of India, 3<sup>rd</sup> Edition 2014.
2. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar "Foundations of Machine Learning", MIT Press, 2012.
3. Tom Mitchell, "Machine Learning", McGraw Hill, 3<sup>rd</sup> Edition, 1997.
4. MACHINE LEARNING - An Algorithmic Perspective, Second Edition, Stephen Marsland, 2015.
5. Stuart J. Russell and Norvig, Artificial Intelligence – A Modern Approach, Second Edition, Pearson Education, 2007
6. Elaine Rich, Kevin Knight, Shivashankar B Nair, *Artificial Intelligence*, Third Edition, Tata McGraw-Hill Education Private Limited, Seventh Reprint 2011.
7. K. Meena & R. Dhanapal, Artificial Intelligence and Expert Systems, International Books, Truchlrapalll, 2001. (ISBN : 81 - 900811 - 1 - x)
8. Charu C. Aggarwal, "Data Classification Algorithms and Applications", CRC Press, 2014.
9. Charu C. Aggarwal, "DATA CLUSTERING Algorithms and Applications", CRC Press, 2014.
10. Kevin P. Murphy "Machine Learning: A Probabilistic Perspective", The MIT Press, 2012
11. Vinod Chandra S. Sand Anand Hareendran S., Artificial Intelligence and Machine Learning, PHI Learning Private Limited, 2014
12. <https://www.analyticsinsight.net/the-difference-between-artificial-intelligence-and-machine-learning/>
13. <https://marutitech.com/artificial-intelligence-and-machine-learning/>

### COURSE OUTCOMES:

- Recognize the characteristics of Machine Learning techniques that enable to solve real world problems
- Recognize the characteristics of machine learning strategies
- Apply various supervised learning methods to appropriate problems
- Identify and integrate more than one techniques to enhance the performance of learning
- Understand basic AI Techniques

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## PROFESSIONALETHICS

Second Year

### CORE CHOICE COURSE III USER INTERFACE DESIGN AND DEVELOPMENT (Theory)

Semester III

Code: P22CSCC3A

Credit:4

#### COURSE OBJECTIVES:

- To learn new emerging webtechnologies.
- To gain knowledge and skills required for web development careers.
- To develop skills in the use and application of specific methods in user experience design.

#### UNIT – I HTML, XML, CSS & RWD:

Introduction To HTML- DHTML , XML – Structuring XML document using DTD – Schemas – XML parsers – DOM – SAXpresentation technologies – XSL– XFORMS – XHTML – Transformations – XSLT – XLINK – XPATH – XQuery. Responsive Web Design – Intro - Fluid Grid – Viewport - Media Queries – Images. Introduction To CSS- Syntax, Selectors - Types of style sheets.

#### UNIT– II CLIENT SIDE SCRIPTING:

Java Script – Advantages – Data types – Variables – Operators – Control statements– Functions – Objects and arrays – Windows and frames – Forms.AJAX–XMLHttpRequest (XHR) – Create Object – Request – Response – Ready state.

#### UNIT– III SERVER SIDE SCRIPTING:

Introduction To PHP – DataTypes–ControlStructures–Arrays-Function– Html Form with PHP –Form Handling& Validation - File Handling – Cookies – Sessions– Filters– Exception Handling- DatabaseConnectivityWithMySQL.

#### UNIT– IV ANGULAR JS & JQUERY:

Angular JS Expression– Modules – Directives– Data Binding– Controllers – Scopes –Filters – Services – Tables – Events – Form – Validation.Query Syntax – Selects – Events –jQuery Effects – jQuery – jQuery HTML– jQuery Traversing.

#### UNIT – V UX & UI:

UX Introduction – Elements of UX Design - UX Design Process – Research Methods and Tools - Understanding User Needs and Goals. UX Design Process:Visual Design Principles - Information Design and Visualization - Interaction Design Prototyping Tools - Usability Test. UI Introduction - User Interface Components - Tools and Processes.

## REFERENCES:

1. Jeffrey C. Jackson, Web Technologies: A Computer Science Perspective, Pearson Education, 2009.
2. Kogent Learning Solutions Inc., Web Technologies Black Book, Dreamtech Press, 2009.
3. Ken Williamson, Learning AngularJS: A Guide to AngularJS Development, O'Reilly, 2015.
4. Jon Duckett, JavaScript and JQuery: Interactive Front-End Web Development, John Wiley and Sons Inc., 2014.
5. Callum Macrae, Learning from JQuery, O'Reilly, 2013.
6. K.Meena, R.Slvakumar, A .B.Karthick Anand Babu, Web Programming with PHP and Mysql, Himalaya Publications. Mumbai, 2012. (ISBN: 978- 93 - 5051 -581•5)
7. Steve Krug, Dont Make Me Think, 2nd Edition, New Riders Publishing, USA, 2006.
8. <https://docs.angularjs.org/tutorial>
9. <https://developer.mozilla.org/en-US/docs/Learn/JavaScript>
10. <https://www.javatpoint.com/jquery-tutorial>

## COURSE OUTCOMES:

On completion of the course, student will be able to:

- Work with XML technologies.
- Design web page to perform form validation using client-side Scripting language.
- Implement new technologies such as Angular JS and JQuery.
- Develop web applications using server-side scripting language.
- Effectively select and utilize design thinking processes and UX/UI tools.

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# PROFESSIONALETHICS

Second Year

## ELECTIVE COURSE III BLOCK CHAIN TECHNOLOGY (Theory)

Semester III

Code: P22CSE3B

Credit: 4

### COURSE OBJECTIVES:

- To understand the history, types and applications of Blockchain
- To acquire knowledge about cryptography and consensus algorithms.
- Deploy projects using Web3j and design block chain based applications.

### UNIT– 1 INTRODUCTION TO BLOCKCHAIN:

DistributedDBMS–LimitationsofDistributedDBMS,IntroductiontoBlock chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features of Blockchain, and Types of Blockchain.

### UNIT– II BLOCK CHAIN ARCHITECTURE:

Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributer P2P, Structure of Block chain – Consensus mechanism: Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault Tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET)

### UNIT– III BLOCK CHAIN- BASED FUTURES SYSTEM:

Project presentation – Futures smart contract: Block chain oracles - Web3j: Setting up the Web3J- Installing web3j- Wallet creation, Java client: The wrapper generator- Initializing web3j- Setting up Ethereum accounts- Deploying the contract

### UNIT–IV BLOCK CHAINS IN BUSINESS AND CREATING ICO:

Publicversusprivateandpermissionedversuspermissionlessblockchains-Privacy and anonymity in Ethereum- Why are privacy and anonymity important?  
-The Ethereum Enterprise Alliance- Blockchainas-a-Service- Initial Coin Offering (ICO): Project setup for ICO implementation- Token contracts- Token sale contracts- Contract security and testing the code.

### UNIT– V DISTRIBUTEDST ORAGEIPFS AND SWARM:

Ethereum Virtual Machine- Swarm and IPFS: Installing IPFS, Hosting ourfrontend: Serving your frontend using IFPS, Serving your frontend using Swarm, IPFS file uploader project: Project setup the web page

### UNIT–VI CURRENT CONTOURS ( For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

1. Imran Bashir, “Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained”, 2nd Edition, Packt Publishing Ltd, March 2018.
2. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, “Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger”, Packt Publishing Limited, 2018.
3. Andreas M. Antonopoulos, “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”, O’Reilly Media Inc, 2015.
4. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”, Princeton University Press, 2016.
5. <https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology>
6. <https://www.ibm.com/in-en/topics/what-is-blockchain>
7. <https://www.investopedia.com/terms/b/blockchain.asp>

## COURSE OUTCOMES:

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

- Contentedly discuss and describe the history, types and applications of Block chain
- Gains familiarity with cryptography and Consensus algorithms.
- Create and deploy projects using Web3j.
- Implement an ICO on Ethereum
- Design block chain based application with Swarm and IPFS

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## PROFESSIONAL ETHICS, HUMAN VALUES

Second Year

NON-MAJOR ELECTIVE COURSE II  
FILM APPRECIATION

Semester III

Code: P22VCNME2

(Theory)

Credit: 2

### COURSE OBJECTIVES:

- To understand the powers and characteristics of cinema.
- To learn how and why it is so influential.
- To learn to analyse or read a film.
- Appraise films in terms of style and mise-en-scene.
- To develop sensitivity towards cinema; be fully aware and appreciative of the technique, aesthetics, cultural aspects and ideology OF CINEMA.

### UNIT – I THE MEDIUM THAT IS CINEMA:

Film as art: creativity, technology, and business. - why and how do movies affect us? how is a film different from other media like novels or plays? understanding how films are made -understanding of the various disciplines involved in filmmaking - role of films in our society during the last 100 years – understanding the language of cinema through world classics.

### UNIT – II TIME AND SPACE:

How film affects our experience of seeing - how film affects our perception of time and space: how are time and space manipulated in cinema? - space as spectacle - anthropomorphic space - space denied - unhindered space - autonomous space - space as memory.

### UNIT – III FILM AESTHETICS:

The act of viewing - cinematic codes – mise –en –scene , editing , sound and their influence on the narrative – film styles – film genres – film as system.

### UNIT – IV FILM LANGUAGE:

Images and Signs in Films – Sequence and Script Analysis - Cinematic Realism in Global and Indian Context -Indian Popular Films -Indian Films: Alternative Practices.

### UNIT – V FILM ANALYSIS:

Auteur Films – Psychoanalytical Perspective- Gender Perspective – Narrative Study – Post Modern Perspective – Caste Perspective – Marxist Perspective – Disability Studies

## **UNIT – VI CURRENT CONTOURS:** (For Continuous Internal Assessment Only:

An Assignment in the form of an auteur critique on a major filmmaker. A general quiz on world classics and technical elements of a film. A video review of a film of the student's choice.

### **REFERENCES:**

The Film Appreciation Book:

1. The Film Course You Always Wanted to Take - Jim Piper, Allworth, 2014.
2. Film Appreciation – UtpalDatta, Bluerose Publishers Pvt. Ltd, 2021.
3. Deep Focus: Reflections on Cinema – Satyajit Ray, HarperCollins, 2017.
4. Reading the Silver Screen: A Film Lover's Guide to Decoding the Art Form That Moves – Thomas Foster, Harper Perennial, 2016.
5. Kleinmans, Chuck. "Marxism and Film." In The Oxford Guide to Film Studies. Edited
6. by John Hill and Pamela Church-Gibson, 106–113. Oxford: Oxford University Press,
7. The Filmmaker's Eye: The Language of the Lens: The Power of Lenses and the Expressive Cinematic Image - Gustavo Mercado, Routledge, 2019.
8. Psychoanalysis and Hidden Narrative in Film: Reading the Symptom – Trevor C. Pederson, Routledge, 2018.
9. Semiotics and the Analysis of Film – Jean Mitry and Christopher King, Indiana University Press, 2000.
10. The Routledge Companion to Caste and Film in India - Joshil K. Abraham and Judith Misrahi-Barak , 2022.
11. Postmodernism in the Cinema - Cristina Degli-Esposti , Berghahn Books, Incorporated, 1998. 12. <http://www.sensesofcinema.com/contents/directors/index.html> 13. <http://www.filmsite.org/>

### **COURSE OUTCOMES;**

Upon the successful completion of this course- students would be able:

- To appraise and contextualize films and filmmakers from a technical, aesthetic, cultural and ideological point-of-view.
- To explain the language of pictures and sounds
- To decode the meaning created by the design, juxtaposition and sequencing of films.
- To explore the relationship between cinema and the society.

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**Second Year**

**CORE PRACTICAL III  
MACHINE LEARNING  
(Practical)**

**Semester III**

**Code: P22CSCC3P**

**Credit: 2**

**Implement the following concepts using C/ Java/ Python**

1. Cleaning and Pre-processingData
2. Feature Extraction
3. Simple Linear RegressionModels
4. K Nearest Neighbors
5. K-means clustering
6. Classification
7. Support Vector Machines

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**CORE CHOICE PRACTICAL III**

**Second Year**

**Semester III**

**USER INTERFACE DESIGN AND DEVELOPMENT  
(Practical)**

**Code: P22CSCC3AP**

**Credit: 2**

**List of Exercises**

1. Create an Internal and External Stylesheet.
2. Working with XML and CSS.
3. Write a Java Script code to perform form validation.
4. Working with AJAX.
5. Working with Angular JS Directives.
6. Working with Angular JS Expressions.
7. Working with jQuery Selectors.
8. Working with jQuery Events and Effects.
9. Program to perform PHP Form Validation.
10. Program to demonstrate PHP Form Handling.

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## PROFESSIONAL ETHICS

Second Year

**CORE COURSE VII**  
**AGILE TECHNOLOGIES**  
(Theory)

Semester IV

Code: P22CSCC41

Credit: 5

### **COURSE OBJECTIVES:**

- To provide students with a theoretical as well as practical understanding of agile software development practices and how small teams can apply them to create high-quality software.
- To provide a good understanding of software design and a set of software technologies and APIs.
- To understand Agile development and testing.

### **UNIT– I INTRODUCTION:**

Theories for Agile Management – Agile Software Development – Traditional Model vs. Agile Model – Classification of Agile Methods – Agile Manifesto and Principles– Agile Project Management – Agile Team Interactions – Ethics in Agile Teams - Agility in Design, Testing – Agile Documentations – Agile Drivers, Capabilities and Values

### **UNIT– II AGILE PROCESS:**

Lean Production - SCRUM, Crystal, Feature Driven Development - Adaptive Software Development - Extreme Programming: Method Overview – Lifecycle – Work Products, Roles and Practices.

### **UNIT– III AGILITY AND KNOWLEDGE MANAGEMENT:**

Agile Information Systems – Agile Decision Making - Earl\_S Schools of KM – Institutional Knowledge Evolution Cycle – Development, Acquisition, Refinement, Distribution, Deployment, Leveraging – KMin Software Engineering –Managing Software Knowledge – Challenges of Migrating to Agile Methodologies – Agile Knowledge Sharing – Role of Story - Cards – Story - Card Maturity Model (SMM).

### **UNIT– IV AGILITY AND REQUIREMENTS ENGINEERING:**

Impact of Agile Processes in RE – Current Agile Practices – Variance – Overview of RE Using Agile – Managing Unstable Requirements –Requirements Elicitation– Agile Requirements Abstraction Model – Requirements Management in Agile Environment, Agile Requirements Prioritization – Agile Requirements Modeling and Generation – Concurrency in Agile Requirements Generation.

### **UNIT– V AGILITY AND QUALITY ASSURANCE:**

Agile Product Development – Agile Metrics – Feature Driven Development (FDD) – Financial and Production Metrics in FDD – Agile Approach to Quality Assurance - Test Driven Development – Agile Approach in Global Software Development.

## **UNIT–VI CURRENT CONTOURS(For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. David J. Anderson and Eli Schragenheim, —Agile Management for Software Engineering: Applying the Theory of Constraints for Business Results, Prentice Hall, 2003.
2. Hazza and Dubin sky,—Agile Software Engineering, Series: Under graduateTopics in Computer Science, Springer, 2009.
3. Craig Larman, —Agile and Iterative Development: A Manager\_s Guidel, Addison-Wesley, 2004.
4. Kevin C. Desouza, —Agile Information Systems: Conceptualization, Construction, and Management, Butterworth-Heinemann, 2007.

### **COURSE OUTCOMES:**

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

- Realize the importance of interacting with business stakeholders in determining the requirements for a software system;
- Perform iterative software development processes:how to plan them,how to execute them.
- Develop techniques and tools for improving team collaboration and software quality.
- Understand requirement engineering
- Understand quality assurance

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# PROFESSIONAL ETHICS

Second Year

**CORE COURSE VIII  
CLOUD COMPUTING**

Semester IV

Code: P22CSCC42

(Theory)

Credit: 5

## **COURSE OBJECTIVE:**

- To be Familiar with the Cloud Architecture
- To Understand about Cloud Service Models
- To Know the Concept of Virtualization in Cloud Computing

## **UNIT– I INTRODUCTION TO CLOUD:**

Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, A Closer Look, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments. Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples- VMware and Microsoft Hyper-V.

## **UNIT– II CLOUD COMPUTING ARCHITECTURE:**

Introduction, Cloud Reference Model, Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds, Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges, Cloud Interoperability and Standards, Scalability and Fault Tolerance

## **UNIT– III DEFINING THE CLOUDS FOR ENTERPRISE:**

Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service. Scaling a cloud infrastructure- Capacity Planning, Cloud Scale. Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management.

## **UNIT–IV ANEKA:**

Cloud Application Platform Framework Overview, Anatomy of the Aneka Container, From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds, Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management, Aneka SDK, Management Tools.

## **UNIT–V CLOUD APPLICATIONS:**

Scientific Applications – Healthcare, Geo science and Biology. Business and Consumer Applications - CRM and ERP, Social Networking, Media Applications and Multiplayer Online Gaming.

## **UNIT–VI CURRENT CONTOURS(For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. Mastering Cloud Computing by Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi from TMH 2013.
2. George Reese Cloud Application Architectures,First Edition,O'ReillyMedia 2009
3. Cloud Computing and SOA Convergence in Your Enterprise A Step-by-Step Guide by David S. Linthicum from Pearson 2010.
4. Cloud Computing 2<sup>nd</sup> EditionbyDr.Kumar Saurabh fromWileyIndia2012.
5. Cloud Computing– web based Applications that change the way you work and collaborate Online – Micheal Miller.Pearson Education.
6. [http://index-of.co.uk/Cloud-Computing-Books/Essentials%20of%20cloud%20computing%20\(2015\).pdf](http://index-of.co.uk/Cloud-Computing-Books/Essentials%20of%20cloud%20computing%20(2015).pdf)
7. [http://dphoto.lecturer.pens.ac.id/lecture\\_notes/internet\\_of\\_things/CLOUD%20COMPUTING%20Principles%20and%20Paradigms.pdf](http://dphoto.lecturer.pens.ac.id/lecture_notes/internet_of_things/CLOUD%20COMPUTING%20Principles%20and%20Paradigms.pdf)
8. <https://www.javatpoint.com/aneka-in-cloud-computing>
9. <https://www.javatpoint.com/cloud-computing-architecture>

### **COURSE OUTCOMES:**

On completion of this course, the students will be able to:

- Understand the concept of virtualization and how this has enabled the development of Cloud Computing
- Know the fundamentals of cloud, cloud Architectures and types of services in cloud
- Understand scaling,cloud security and disaster management
- Design different Applications in cloud
- Explore some important cloud computing driven commercial systems.

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**Second Year**

**Semester IV**

**ENTREPRENEURSHIP /  
INDUSTRY BASED COURSE  
TECHNOLOGY INNOVATION AND  
SUSTAINABLE ENTERPRISE**

**Code: P22CSIBC**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- Provide information, frameworks, and tools for identifying and pursuing sustainable business opportunities
- Inform students of the changing dynamics of nature–human interdependencies globally
- Examine examples of innovator supplementing successful green strategies

**UNIT– I INNOVATION:**

Need – Objectives of innovation – Technology innovation – its importance - Knowledge Management- need - Business strategies related to knowledge management - Knowledge Management Approaches - Transformation of an enterprise through Knowledge Management –Creating Knowledge Management System in Organization Establishing Knowledge Management through IT - Organizational culture for Knowledge Management - Future of Knowledge Management

**UNIT– II TECHNOLOGY TRANSFER AND JOINT VENTURES:**

Policy, Procedure & Practices-India's Technology base and Capabilities – Preference of Indian Technology - major Constraints and problems - Operational constraints - Problems in Indian Business Environment Problems in Finalization of Agreement- Major Problems in Technology transfer Collaboration Agreements, R& D, Import Substitution, Scaling, Diagrams – Patterns and Intellectual Property rights.

**UNIT– III WEB MARKETING:**

Meaning - Benefits of Web Marketing - Myths and Facts in Web Marketing Web Psychology: Understanding the Internet mind - The Internet and the Law: Copyright, Censorship, Privacy, Jurisdiction- Do's and Don'ts on Web

**UNIT– IV WEBMARKETING STRATEGIES:**

Choosing the strategy- Online store fronts -Target Marketing Attracting Customers- Web Advertising - E-Mail Marketing-Instant market research - Securities Issues

**UNIT–V ENTERPRISE RESOURCE PLANNING:**

The E-Business backbone – Meaning - ERP decision Enterprise Architecture Planning- ERP Implementation- The Future of ERP Applications - Procurement- Business Blueprint Planning.



## PROFESSIONAL ETHICS

Second Year

VALUE ADDED COURSE II  
FOUNDATION OF IOT

Semester IV

Code: P22CSVAC2

(Theory)

Credit: 2

### COURSE OBJECTIVES:

- To understand the concepts of Internet of Things
- To identify the various elements of an IoT System.
- To understand the various means of communication from Node / Gateway to Cloud Platforms.

### UNIT– I INTRODUCTION OF IOT:

Introduction to IoT, Current technological trends and future prospects, -Evolution of IoT, Business Scope, Relation with embedded system

### UNIT– II BASIC ARCHITECTURE OF AN IOT:

From M2M to IoT, M2M towards IoT, IoT Value Chains, An emerging industrial structure for IoT.

### UNIT– III ELEMENTS OF IOT:

Application Sensors & Actuators- Edge Networking (WSN)– Gateways-IoT Communication Model – WPAN & LPWA,

### UNIT– IV OVERVIEW OF IOT SUPPORTED HARDWARE PLATFORMS:

Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards, Wearable Development Boards.

### UNIT–V COMMUNICATION AND CONNECTIVE TECHNOLOGIES:

IoT Communication Model, Cloud computing in IoT, IoT in cloud architecture, Logging on to cloud, Selecting and Creating cloud service, cloud based IoT platforms - IBM Watson, Google cloud.

### UNIT – VI CURRENT CONTOURS(For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned

### REFERENCES:

1. The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick, Omar Elloumi.
2. Architecting the Internet of Things, Springer publications. Author(s): Dieter Uckelmann, Mark Harrison, Florian Michahelles.
3. Internet of Things with Arduino Cookbook, Packt Publications. Author(s): Marco Schwatz.
4. Internet of Things and Data Analytics, Hwaiyu Geng, 2017, Wiley Publications
5. <https://www.geeksforgeeks.org/architecture-of-internet-of-things-iot/>

6. <https://fiware-tutorials.readthedocs.io/en/1.0.0/iot-sensors/>

## **COURSE OUTCOMES:**

On Completion of the course, student will be able:

- To learn and understand the technology and current trends in Internet of things.
- To understand the various elements of IoT system and hardware devices.
- To learn the programming languages and platforms for building IoT applications.
- To understand the cloud computing and its relevance for developing IoT applications.
- To understand IoT connective technologies

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## PROFESSIONAL ETHICS

Second Year  
Code: P22CSPW

PROJECT

Semester - IV  
Credit: 5

Each candidate shall be required to take up a Project Work and submit it at the end of the final year. The Head of the Department shall assign the Guide who, in turn, will suggest the Project Work to the student in the beginning of the final year. A copy of the Project Report will be submitted to the University through the Head of the Department on or before the date fixed by the University.

The Project will be evaluated by an internal and an external examiner nominated by the University. The candidate concerned will have to defend his/her Project through a Viva-voce.

### ASSESSMENT/ EVALUATION/ VIVA-VOCE:

#### 1. PROJECT REPORT EVALUATION (Both Internal & External):

- I. Plan of the Project - 20marks
- II. Execution of the Plan/collection of Data / Organisation of Materials / Hypothesis, Testing etc and presentation of the report. - 45marks
- III. Individual initiative - 15marks

#### 2. VIVA-VOCE/ INTERNAL & EXTERNAL - 20marks

**TOTAL - 100 marks**

### PASSING MINIMUM:

Project	<b>Vivo-Voce 20 Marks</b> 40% out of 20 Marks (i.e. 8 Marks)	<b>Dissertation 80 Marks</b> 40% out of 80 marks (i.e. 32 marks)
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A candidate shall be declared to have passed in the Project work if he/she gets not less than 40% in each of the Project Report and Viva-voce but not less than 50% in the aggregate of both the marks for Project Report and Viva-voce.

A candidate who gets less than 40% in the Project must resubmit the Project Report. Such candidates need to defend their submitted Project at the Viva-voce within a month. A maximum of 2 chances will be given to the candidate.

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