# PERIYAR UNIVERSITY

## PERIYAR PALKALAI NAGAR

## SALEM – 636011

# B.Sc. INFORMATION SCIENCE
## *CHOICE BASED CREDIT SYSTEM*

## OBE REGULATIONS AND SYLLABUS

**(SEMESTER PATTERN)**

**( For Candidates admitted in the Colleges affiliated to**

**Periyar University from 2021 - 2022 onwards)**

**OUTCOME BASED EDUCATION REGULATIONS AND SYLLABUS**
(With effect from the academic year 2021-2022 onwards)

## 1. PREAMBLE

The programme prepares under Graduates in **Information Science** with strong theoretical inputs and relevant practical knowledge, who can be employed in industries. The programme develops requisite professional skills and problem solving abilities to pursue a successful career in software industry and for pursuing higher studies in Information Science.

## 2. GRADUATE ATTRIBUTES

1. Computational Knowledge
2. Problem Analysis & Solving
3. Design & Development of Solutions
4. Modern Tool Usage
5. Communication skills
6. Innovation & Entrepreneurship
7. Societal & Environmental concern

## 3. PROGRAMME SPECIFIC QUALIFICATION ATTRIBUTES

The programme specific qualification attributes meant to be achieved through subjects in the programme in terms of

1. Knowledge and understanding  level (K1 and K2)
2. Application level (K3)
3. Analytical level (K4)
4. Evaluation capability level (K5)
5. Scientific or Synthesis level (K6)

## 4. ELIGIBILITY FOR ADMISSION

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subject under Board of Higher Secondary Examination, Tamil Nadu as per norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may  be prescribed are permitted to appear and qualify  for the **Bachelor of Science in Information Science** degree examination of this university after a programme of study of three academic years.

5. **PROGRAMME OBJECTIVES AND OUTCOMES**
   ➢ **Programme Educational Objectives (PEOs)**

**PEO1:** Graduates are prepared to be employed in IT industries by providing expected domain Knowledge.

**PEO2:** Graduates are provided with practical training, hands-on and project experience to meet the industrial needs.

**PEO3:** Graduates are motivated in their career and entrepreneurial skill development to become a global leader.

**PEO4**: Graduates are trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.

**PEO5:** Graduates are trained to address social issues and guided to approach problems with solutions.

➢ **Programme Specific Outcomes(PSOs)**

**After completion of the program the graduates will be able**

**PSO1:** To understand the important elements of computer system, including hardware and networking.

**PSO2:** To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

**PSO3:** To communicate effectively in both verbal and written form in industry and society.

**PSO4:** To Apply the technologies in various fields of Computer Science.

➢ **Programme Outcomes(POs)**
After completion of the programme, the graduates will be able

**PO1:** To develop fundamental knowledge of scientific theories and methods in computer science.

**PO2:** To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior to express clearly on academic issues.

**PO3:** To apply the technologies in various fields of Information Science, including Mobile applications, Web site development and management, databases, and computer networks**.**

**PO4:** To communicate effectively in both verbal and written form in such a way as to demonstrate their ability to present information clearly , logically in industry and society.

### 6. DURATION OF THE PROGRAMME

The programme shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

### 7. COURSE OF STUDY

The programme of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time. The syllabus for various subjects shall be clearly demarcated into five units in each subject. Part -I, Part-II, Part – III, Part – IV and Part-V subjects are as prescribed in the scheme of examination. The Extension Activities are a must for each student to take part in at least in any one of the activities like NSS, YRC, SPORTS and RRC for the fulfillment of the degree.

### 8. EXAMINATIONS

The theory examination shall be three hour duration for each paper at the end of every semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination. The practical examinations for core subjects and SBEC should be conducted at the end of the every semester.

**Submission of record note books for practical examinations**

Candidates appearing for practical examinations should submit bonafide Record note books prescribed for practical examinations, otherwise the candidates will not be permitted to appear for the practical examinations. However, in genuine cases where the students who could not submit the record note books, they may be permitted to appear for the practical examinations, provided the concerned Head of the Department certified that the candidate has performed the experiments prescribed for the course. For such candidates zero (0) marks will be awarded for record note books.

### 9. Revision of Regulations and Curriculum

The University may revise/amend/ change the Regulations and Scheme of Examinations, if found necessary.

### 10. PASSING MINIMUM
#### (a) Theory

The candidate shall be declared to have passed the examination if the candidate **secures not less than 40marks** put together out of 100 marks (**CIA+EA). Minimum 40% should be secured (30 out of 75) in EA** of each theory subject**.**

#### (b) Practical/Project viva voce
The candidate shall be declared to have passed the examination if the candidate **secures not less than 40marks** put together out of 100 marks (**CIA + EA). Minimum 40% should be secured (24 out of 60) in EA** of each Practical subject.

11. **Marks Distribution and Question Paper Pattern for B.Sc., IS**

    **11.1 Theory –Marks Distribution**

    | | |
    |---|---|
    | Maximum Marks | : 100 Marks |
    | External [EA] | : 75 Marks |
    | Internal [CIA] | : 25 Marks |

    **(a). Theory - Question Paper Pattern [External]** **(Total Marks: 75)**

    | Part | Approaches | Mark Pattern |
    |---|---|---|
    | A | One word (Answer all questions &Three questions from each unit) | 15X1 = 15 (Multiple Choice Questions) |
    | B | 100 to 200 words (Answer any Two out of five questions & One question from each unit) | 2X5 = 10 (Analytical type questions) |
    | C | 500 to 1000 words(Answer ALL questions & One question from each unit with Internal Choice) | 5X10 = 50 (Essay type questions) |

    **(b) Theory - Internal Marks Distribution** (Total Marks: 25)

    | | | |
    |---|---|---|
    | Attendance | : | 5 Marks |
    | Assignment | : | 5 Marks |
    | Test | : | 15 Marks |

    **11.2. Practical – Marks Distribution**

    | | | |
    |---|---|---|
    | Maximum Marks | : | 100 Marks |
    | External [EA] | : | 60 Marks |
    | Internal [CIA] | : | 40 Marks |

**(a) Practical-External Marks Distribution  (Total  Marks :60 )**
   For each practical question the marks should be awarded as follows **(External)**

   | | | |
   |---|---|---|
   | i) | Algorithm/flowchart | -20% |
   | ii) | Writing the program in the main answer book | -30% |
   | iii) | Test and debug the program | -30% |
   | iv) | Printing the correct output | -20% |

   (Marks may be proportionately reduced for the errors committed in each of the above)

 **Practical Question Paper Pattern**

> **Student should attend two questions (either or pattern)**

Note:

(i)     Practical I to Practical VII and SBEC Practical have same pattern

(ii)    Core & SBEC Practical Examination must be conducted at the end of every Semester

**(b) Practical - Internal Marks Distribution (Total Marks: 40)**

- Record                                              :  15 Marks
- Internal Practical examinations      :    25 Marks

**11.3 Project Evaluation:**

| | |
|---|---|
| Continuous Internal Assessment | : 40 Marks |
| Evaluation (External) | : 40 Marks |
| Viva-voce (jointly) | : 20 Marks |

**12.     COMMENCEMENT OF THIS REGULATION :**

These regulations shall take effect from the academic year 2021-2022, i.e, for students who are to be admitted to the first year of the programme during the academic year 2021-2022 and thereafter.

**Scheme of Examinations from the Academic Year 2021-2022**

**Credit Distribution as per the University Norms.**

| SEMESTER | I | II | III | IV | V | VI | Total Credits |
|---|---|---|---|---|---|---|---|
| PART – I | 3 | 3 | 3 | 3 | - | - | 12 |
| PART – II | 3 | 3 | 3 | 3 | - | - | 12 |
| ALLIED | 4 | 6 | 4 | 6 | - | - | 20 |
| CORE THEORY | 5 | 10 | 9 | 4 | 12 | 5 | 45 |
| CORE PRATICAL | 2 | 2 | 2 | 2 | 4 | 8 | 20 |
| ELECTIVE | - | - | - | - | 4 | 8 | 12 |
| SBEC | - | - | 3 | - | 3 | 3 | 9 |
| NMSDC | - | 2 | - | 2 | - | 2 | 6 |
| NMEC | - | - | 2 | 2 | - | - | 4 |
| PROFESSIONAL ENGLISH | 4 | 4 | - | - | - | - | 8 |
| EVS | - | - | - | - | - | - | - |
| ADD-ON COURSE | - | - | - | - | - | - | - |
| VALUE EDUCATION | 2 | - | - | - | - | - | 2 |
| EXTENSION ACTIVITY | - | - | - | - | - | 1 | 1 |
| **Cumulative Total Credits** | **23** | **30** | **26** | **22** | **23** | **27** | **151** |

## COURSE OF STUDY AND SCHEME OF EXAMINATION

| SEM | PART | SUB CODE | TITLE OF THE SUBJECT | Hrs. Lect. | Hrs. Lab | CREDIT | CIA | EA | TOTAL |
|-----|------|----------|----------------------|------|-----|--------|-----|-----|-------|
| **SEMESTER – I** |||||||||| 
| I | I | 21UFTA01 | Tamil I | 6 | - | 3 | 25 | 75 | 100 |
| | II | 21UFEN01 | English I | 6 | - | 3 | 25 | 75 | 100 |
| | III | 21UIS01 | Core I: Problem Solving Through C | 6 | - | 5 | 25 | 75 | 100 |
| | III | 21UISP01 | Practical I: C Programming | - | 3 | 2 | 40 | 60 | 100 |
| | III | | Allied I | 7 | - | 4 | 25 | 75 | 100 |
| | IV | 21UVE01 | Value Education | 2 | - | 2 | 25 | 75 | 100 |
| | IV | | Professional English –Physical Science I | 4 | - | 4 | 25 | 75 | 100 |
| | | | **Total** | **31** | **3** | **23** | **190** | **510** | **700** |
| **SEMESTER – II** ||||||||||
| II | I | 21UFTA02 | Tamil II | 6 | - | 3 | 25 | 75 | 100 |
| | II | 21UFEN02 | English II | 4 | - | 3 | 25 | 75 | 100 |
| | | NMSDC-I | Language Proficiency for Employability -Effective English | 2 | - | 2 | 25 | 74 | 100 |
| | III | 21UIS02 | Core II : Data Structure and Algorithms | 3 | - | 5 | 25 | 75 | 100 |
| | III | 21UISP02 | Practical II : Data Structure using C | - | 3 | 2 | 40 | 60 | 100 |
| | III | 21UIS03 | Core III : Computer Organization and Architecture | 4 | - | 5 | 25 | 75 | 100 |
| | III | | Allied II | 5 | - | 4 | 25 | 75 | 100 |
| | III | | Allied – Practical | | 2 | 2 | 40 | 60 | 100 |
| | IV | 21UES01 | Environmental Studies | 1 | - | - | 25 | 75 | 100 |
| | IV | | Professional English – Physical Science II | 4 | - | 4 | 25 | 75 | 100 |
| | | | **Total** | **29** | **5** | **30** | **280** | **720** | **1000** |
| **SEMESTER – III** ||||||||||
| III | I | 21UFTA03 | Tamil – III | 6 | - | 3 | 25 | 75 | 100 |
| | II | 21FEN03 | English – III | 6 | - | 3 | 25 | 75 | 100 |
| | III | 21UIS04 | Core IV: Relational Database Management Systems | 3 | - | 5 | 25 | 75 | 100 |
| | III | 21UISP03 | Practical III: SQL and PL/SQL | - | 2 | 2 | 40 | 60 | 100 |
| | III | 21UIS05 | Core V: Operating System | 3 | - | 4 | 25 | 75 | 100 |
| | III | | Allied III | 6 | - | 4 | 25 | 75 | 100 |
| | III | | Allied -Practical | - | - | - | - | - | - |
| | IV | 21UISSP01 | SBEC-I : Office Automation Lab | - | 2 | 3 | 40 | 60 | 100 |
| | IV | NMEC-1 | Non -Major Elective Course – I | 2 | - | 2 | 25 | 75 | 100 |
| | | | **Total** | **26** | **4** | **26** | **230** | **570** | **800** |

| SEM | PART | SUB CODE | TITLE OF THE SUBJECT | Hrs. Lect. | Hrs. Lab | CREDIT | CIA | EA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| | | | **SEMESTER – IV** | | | | | | |
| IV | I | 21UFTA04 | Tamil – IV | 6 | - | 3 | 25 | 75 | 100 |
| | II | 21UFEN04 | English – IV | 6 | - | 3 | 25 | 75 | 100 |
| | III | 21UIS06 | Core VI : Programming in Java | 4 | - | 4 | 25 | 75 | 100 |
| | III | 21UISP04 | Practical IV: Java programming | - | 3 | 2 | 40 | 60 | 100 |
| | III | | Allied IV | 5 | - | 4 | 25 | 75 | 100 |
| | III | | Allied -Practical Lab | - | 2 | 2 | 40 | 60 | 100 |
| | IV | | NMSDC-II Digital Skills for Employability - | 2 | - | 2 | 25 | 75 | 100 |
| | IV | NMEC-2 | Non -Major Elective – II | 2 | - | 2 | 25 | 75 | 100 |
| | IV | Add-on | Add-on Course Internship Programme | - | - | - | - | - | - |
| | | | **Total** | **25** | **5** | **22** | **230** | **570** | **800** |
| | | | **SEMESTER – V** | | | | | | |
| V | III | 21UIS07 | Core VII: Information Security | 5 | - | 4 | 25 | 75 | 100 |
| | III | 21UIS08 | Core VIII: Web Technology | 5 | - | 4 | 25 | 75 | 100 |
| | III | 21UISP05 | Practical V : Web Technology Lab | - | 3 | 2 | 40 | 60 | 100 |
| | III | 21UIS09 | Core IX : Open Source Technology | 5 | - | 4 | 25 | 75 | 100 |
| | III | 21UISP06 | Practical VI : Open Source Technology Lab | - | 4 | 2 | 40 | 60 | 100 |
| | III | 21UISE01/02/0/03 | Elective – I | 5 | - | 4 | 25 | 75 | 100 |
| | IV | 21UISSP03 | SBEC III-Mobile Application Development | - | 3 | 3 | 40 | 60 | 100 |
| | | | **Total** | **20** | **10** | **23** | **220** | **480** | **700** |
| | | | **SEMESTER – VI** | | | | | | |
| VI | III | 21UIS10 | Core X: Programming in Python | 6 | - | 5 | 25 | 75 | 100 |
| | III | 21UISP07 | Practical VII : Python Programming | - | 4 | 3 | 40 | 60 | 100 |
| | III | 21UISPR01 | Mini Project | - | 5 | 5 | 40 | 60 | 100 |
| | | | NMSDC –III Emerging Technology for Employability –II | 2 | | 2 | 25 | 75 | 100 |
| | III | 21UISE04/0506 | Elective-II | 5 | - | 4 | 25 | 75 | 100 |
| | III | 21UISE07/08/09 | Elective-III | 5 | - | 4 | 25 | 75 | 100 |
| | IV | 21UISS01 | SBEC IV- Quantitative Aptitude | 3 | - | 3 | 25 | 75 | 100 |
| | V | 21UEX01 | Extension Activities | - | - | 1 | - | - | - |
| | | | **Total** | **21** | **9** | **27** | **205** | **495** | **700** |

Practical Examination should be conducted in the same semester

## ELECTIVE SUBJECTS

### Elective – I

| Sem | Part | Subject Code | Subject |
|-----|------|--------------|---------|
| **V** | **III** | 21UISE01 | Artificial Intelligence |
| | | 21UISE02 | Computer Network |
| | | 21UISE03 | Mobile Computing |

### Elective – II

| Sem | Part | Subject Code | Subject |
|-----|------|--------------|---------|
| **VI** | **III** | 21UISE04 | Data Mining and Warehousing |
| | | 21UISE05 | Wireless Network |
| | | 21UISE06 | Computer Graphics |

### Elective – III

| Sem | Part | Subject Code | Subject |
|-----|------|--------------|---------|
| **VI** | **III** | 21UISE07 | Software  Testing |
| | | 21UISE08 | Network Security |
| | | 21UISE09 | Internet of Things |

## Non Major Elective Course – (NMEC)

### Extra Disciplinary Subjects offered by the Department of Information Science

The department can offer any one of the subjects to the other major subject students in each semester.

| PART | SEM | SUB CODE | TITLE OF THE SUBJECT | Lect. Hours | Credit | MARKS | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | CIA | EA | TOTAL |
| **IV** | III | 21UISN01 | NMEC I: Basics Of Computers | 2 | 2 | 25 | 75 | 100 |
| | | 21UISN02 | NMEC I: Computer Applications for Automation | 2 | 2 | 25 | 75 | 100 |
| | IV | 21UISN03 | NMEC II: Basics of Internet | 2 | 2 | 25 | 75 | 100 |
| | | 21UISN04 | NMEC II: Image Editing Tool | 2 | 2 | 25 | 75 | 100 |

## SBEC – Skill Based Elective Courses

| SEM | PART | SUB CODE | TITLE OF THE SUBJECT | Hrs. | | CREDIT | MARKS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Lect. | Lab | | CIA | EA | TOTAL |
| III | IV | 21UISSP01 | SBEC - I : Office Automation Lab | - | 2 | 3 | 40 | 60 | 100 |
| IV | | | | | | | | | |
| V | IV | 21UISSP03 | SBEC -III : Mobile Application Development | - | 3 | 3 | 40 | 60 | 100 |
| VI | IV | 21UISS01 | SBEC-IV : Quantitative Aptitude | 3 | - | 3 | 25 | 75 | 100 |

# Allied Subjects for any Degree offered by the Department of Computer/Information Science

## SYLLABUS - CBCS PATTERN

### EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022

All subjects should be handled and valued by Computer Science Department only. For University practical examinations both Internal and External examiners should be appointed from Department of Computer/Information Science.

**FIRST OPTION (Allied Computer Science)**
**First Year / Second Year (Select any one of the Subject with Practical)**

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. | | CRE DIT | MARKS | | |
|------|----------|----------------------|------|-----|---------|-----|-----|-------|
| | | | Lect. | Lab | | CIA | EA | TOTAL |
| III | I /III 21UISA01 | Allied Paper – I Fundamental of Computers | 7 | - | 4 | 25 | 75 | 100 |
| | II/IV 21UISA02 | Allied Paper – II Computer Applications in Office | 5 | - | 4 | 25 | 75 | 100 |
| | 21UISAP01 | Allied Practical Office Automation | - | 2 | 2 | 40 | 60 | 100 |

**SECOND OPTION (Allied Computer Science)**
**First Year / Second Year (Select any one of the Subject with Practical)**

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. | | CRE DIT | MARKS | | |
|------|----------|----------------------|------|-----|---------|-----|-----|-------|
| | | | Lect. | Lab | | CIA | EA | TOTAL |
| III | I /III 21UISA03 | Allied Paper – I Database Systems | 7 | - | 4 | 25 | 75 | 100 |
| | II/IV 21UISA04 | Allied Paper – II E-Commerce Techniques | 5 | - | 4 | 25 | 75 | 100 |
| | 21UISAP02 | Allied Practical HTML Programming | - | 2 | 2 | 40 | 60 | 100 |

# Allied Subjects for Computer Science/Information Science /BCA
## SYLLABUS - CBCS PATTERN
**EFFECTIVE FROM THE ACADEMIC YEAR 2021-2022**
**FIRST OPTION**
**First Year / Second Year (Select any one of the Subject with Practical)**

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. | | CRE DIT | MARKS | | |
|------|----------|----------------------|------|-----|---------|-----|-----|-------|
| | | | Lect. | Lab | | CIA | EA | TOTAL |
| III | I /III | Allied Paper – I Statistical methods and their applications I | 7 | - | 4 | 25 | 75 | 100 |
| | II/IV | Allied Paper – II Statistical methods and their applications II | 5 | - | 4 | 25 | 75 | 100 |
| | | Allied Practical Statistical Practical | - | 2 | 2 | 40 | 60 | 100 |

**SECOND OPTION**

**First Year / Second Year (Select any one of the Subject with Practical)**

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. | | CRE DIT | MARKS | | |
|------|----------|----------------------|------|-----|---------|-----|-----|-------|
| | | | Lect. | Lab | | CIA | EA | TOTAL |
| III | I /III | Allied Paper –I Principles of Accounting | 7 | - | 4 | 25 | 75 | 100 |
| | II/IV | Allied Paper II Cost and Management Accounting | 5 | - | 4 | 25 | 75 | 100 |
| | | Allied Practical Commerce Practical | - | 2 | 2 | 40 | 60 | 100 |

## THIRD OPTION
### First Year / Second Year (Select any one of the Subject with Practical)

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. Lect. | Lab | CRE DIT | CIA | EA | TOTAL |
|---|---|---|---|---|---|---|---|---|
| III | I /III | Allied Mathematics Paper – I | 7 | - | 4 | 25 | 75 | 100 |
|  | II/IV | Allied Mathematics Paper – II | 5 | - | 4 | 25 | 75 | 100 |
|  |  | Allied Mathematics Practical | - | 2 | 2 | 40 | 60 | 100 |

## FOURTH OPTION
### First Year / Second Year (Select any one of the Subject with Practical)

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. Lect. | Lab | CRE DIT | CIA | EA | TOTAL |
|---|---|---|---|---|---|---|---|---|
| III | I /III | Allied Physics Paper –I | 7 | - | 4 | 25 | 75 | 100 |
|  | II/IV | Allied Physics Paper II | 5 | - | 4 | 25 | 75 | 100 |
|  |  | Allied Physics Practical | - | 2 | 2 | 40 | 60 | 100 |

## FIFTH OPTION
### First Year / Second Year (Select any one of the Subject with Practical)

| PART | SEMESTER | TITLE OF THE SUBJECT | Hrs. Lect. | Lab | CRE DIT | CIA | EA | TOTAL |
|---|---|---|---|---|---|---|---|---|
| III | I /III | Allied Electronics Paper –I | 7 | - | 4 | 25 | 75 | 100 |
|  | II/IV | Allied Electronics Paper II | 5 | - | 4 | 25 | 75 | 100 |
|  |  | Allied Electronics Practical | - | 2 | 2 | 40 | 60 | 100 |

# SEMESTER I

| Subject Title | **PROBLEM SOLVING THROUGH C** | Semester | I |
|---|---|---|---|
| **Subject Code** | **21UIS01** | **Specialization** | NA |
| **Type** | **Core:** Theory | **L:T:P:C** | 86:6:0:5 |

**Course Objective:**

1. It aims to provide exposure to problem-solving through programming.

2. To apprehend the basic concepts of C- Programming language. This course introduces fundamental concepts such as arrays and structures.

3. It covers concepts such as arrays, pointers and file handling methods.

4. It provides technical skills to design and develop various applications.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Recognize the Basic Terminologies of C Programming. | K1 |
| CO2 | Understanding the statement structure and apply simple problems. | K2,K3 |
| CO3 | Understand and apply the pre-defined functions and user defined functions and then apply the simple problems. | K3 |
| CO4 | Demonstrate the operation of Structures and unions. | K3,K4 |
| CO5 | Recognize the operation of Files. | K3,K4 |

| Subject Title | PROBLEM SOLVING THROUGH C | Semester | I | | |
|---|---|---|---|---|---|
| Subject Code | 21UIS01 | Specialization | NA | | |
| Type | Core: Theory | L:T:P:C | 86:6:0:5 | | |
| Unit | Contents | | | Levels | Sessions |
| I | Overview of Computers and Programming: Electronic Computers Then and Now , Computer Hardware, Computer Software , The Software Development Method, Applying the Software Development Method , Professional Ethics for Computer Programmers Fundamentals of C Languages: History of C, Character Set, Identifiers and Overview of C:– Introduction - character set - C tokens - keyword & identifiers – constants – variables - data types – Declarations of variables ,operators - expressions - Evaluation of expression - Mathematical functions - Formatted input and output | | | K1 | 17 |
| II | Decision Statements: If, if else, switch, break, continue - the? Operator - The GOTO statement. – Loop Control Statements: Introduction – for, nested for loops – while, do-while statements – Arrays: One-dimensional - Two dimensional - Multidimensional arrays | | | K2,k3 | 17 |
| III | Character string handling - Declaring and initializing string variables - Reading strings from terminal - Writing strings to screen - String handling functions - User-defined functions: Need for user defined functions – Types of functions - calling a function category of functions - no arguments and no return values - Arguments but no return values - Arguments with return values – Recursion - functions with arrays - The scope and lifetime of variables in functions | | | K2,K3 | 17 |
| IV | Structure: Definition- Structure initialization - Comparison of structure variables - Arrays of structures - Arrays within structures - Structures within structures – unions. Pointers: understanding pointers - accessing the address of a variable - declaring and initializing pointers - accessing a variable through its pointers - pointer expressions - pointers and arrays - pointers and character strings - pointers and functions - pointers and structures | | | K3,K4 | 17 |

| | | | |
|---|---|---|---|
| **V** | File Management in C: defining and opening a file - closing file - I/O operations on files - error handling during I/O operations - Random access to files - command line arguments. Preprocessors | **K3,K4** | **18** |
| | **Learning Resources** | | |
| **Text Books** | 1. Problem solving and program design in C / Jeri R. Hanly, Elliot B. Koffman. —7th ed.,PEARSON <br> 2. E. Balagurusamy, Programming in ANSI C, fifth edition, Tata McGraw-Hill. | | |
| **Reference Books** | 1. V. Rajaraman Computer Programming in C Prentice Hall of India Pvt Ltd, 1st Edition,2004 <br> 2 Yashwvant Kanetkar Let us C BPB Publications 13th Edition, 2014 | | |
| **Website / Link** | http://www.learn-c.org/ <br> http://crasseux.com/books/ctutorial/ | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | S | - |
| **CO2** | S | M | M | S |
| **CO3** | S | L | L | M |
| **CO4** | M | S | M | S |
| **CO5** | S | L | S | S |

S- Strong , M- Medium , L – Low

| Subject Title | **PRACTICAL I :  C-PROGRAMMING** | **Semester** | **I** |
|---|---|---|---|
| Subject Code | **21UISP01** | **Specialization** | **NA** |
| Type | **Core: Practical** | **L:T:P:C** | **45:0:3:2** |

**Course Objective :**

1. To impart Practical Training in C Programming Language.
2. Familiarize the different control and decision making statements in ―C‖.
3. Build programs using arrays and strings.
4. Provide  knowledge on working with files and functions.

**LIST OF PROGRAMS**

1. Develop a C program to print prime numbers within the range of integers given. .
2. Develop a C Program to find the sum and average of given N numbers.
3. Develop a C Program using all decision making and looping statements.
4. Develop a C Program to arrange the given numbers in ascending /descending order.
5. Develop a C Program to perform matrix multiplication.
6. Develop a C Program to manipulate string functions.
7. Develop a C Program to find the Fibonacci series for a give number using recursive function.
8. Develop a C Program to show Call by Value and Call by Reference.
9. Develop a C program to swap two numbers using pointers.
10. Develop a C Program to update the student's details using various file modes.
11.  Develop a C Program to copy the content of one file to another file.

**COURSE OUTCOME:**

1. Study all the Basic Statements in C Programming.
2. Practice the usage of branching and looping statements.
3. Apply string functions and arrays usage.
4. Analysis the use of pointers and files.

| Subject Title | DATA STRUCTURES AND ALGORITHMS | Semester | II |
|---|---|---|---|
| **Subject Code** | **21UIS02** | **Specialization** | **NA** |
| **Type** | **Core: Theory** | **L:T:P:C** | **45:3:0:5** |

**Course Objective**:

1. Understand the basic concept of algorithms.
2. To introduce the various data structures and their implementations.
3. Evaluate the performance of various sorting algorithms.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the concept of algorithms. | K1 |
| CO2 | Understanding the stack and queues. | K2 |
| CO3 | Apply linked list for other data structures. | K2, K3 |
| CO4 | Evaluate the trees and sorting methods. | K3,K4 |
| CO5 | Analyze the sorting and file organizations. | K5 |

| Subject Title | DATA STRUCTURES AND ALGORITHMS | Semester | II |
|---|---|---|---|
| Subject Code | **21UIS02** | Specialization | NA |
| Type | **Core: Theory** | **L:T:P:C** | **45:3:0:5** |

| Unit | Contents | Levels | Sessions |
|---|---|---|---|
| I | Introduction of algorithms, analyzing algorithms, Arrays: Representation of Arrays, Implementation of Stacks and queues, Application of Stack: Evaluation of Expression - Infix to postfix Conversion - Multiple stacks and Queues, Sparse Matrices. | K1 | 8 |
| II | Linked list: Singly Linked list - Linked stacks and queues - polynomial addition - More on linked Lists - Doubly linked List and Dynamic Storage Management - Garbage collection and compaction. | K2 | 8 |
| III | Trees: Basic Terminology - Binary Trees - Binary Tree representations - Binary trees - Traversal - More on Binary Trees - Threaded Binary trees - counting Binary trees. Graphs: Terminology and Representations - Traversals, connected components and spanning Trees, Single Source Shortest path problem. | K2,K3 | 8 |
| IV | Symbol Tables: Static Tree Tables - Dynamic Tree Tables - Hash Tables Hashing Functions - overflow Handling. External sorting : Storage Devices -sorting with Disks : K-way merging - sorting with tapes. | K3,K4 | 10 |
| V | Internal Sorting: Insertion sort - Quick sort - 2 way Merge sort - Heap sort - shell sort - sorting on keys. Files: Files, Queries and sequential organizations - Index Techniques - File organization | K5 | 11 |
| | **Learning Resources** | | |
| Text Books | Ellis Horowitz, Sartaj Shani, Fundamentals of Data Structures, Galgotia publication. | | |
| Reference Books | 1. Data structures Using C Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augenstein, Kindersley (India) Pvt. Ltd., <br> 2. Data structure and Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Pearson Education Pvt. Ltd., | | |
| Website/ Link | 1. www.freetechbooks.com/a-practical-introduction-to-data-structures-and-algorithm-analysis-thirdedition-c-version-t804.html <br> 2. http://www.nptel.ac.in/courses/106101060/ <br> 3. http://www.nptel.ac.in/courses/106104019/ | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | S | S | - |
| CO2 | S | M | M | S |
| CO3 | S | L | L | M |
| CO4 | M | S | M | S |
| CO5 | S | L | S | S |

S- Strong , M- Medium , L – Low

| Subject Title | DATA STRUCTURES USING C | Semester | II |
|---|---|---|---|
| Subject Code | 21UISP02 | Specialization | NA |
| Type | Core: Practical | L:T:P:C | 45:0:3:2 |

**Course Objective :**

1. To impart Practical Training in C Programming Language.
2. Understanding the data structures stack and queues.
3. Apply linked list for other data structures.
4. Analyze the sorting and file organizations.

**LIST OF PROGRAMS:**

1. Write a C program to create two array list of integers. Sort and store the elements of both of them in third list.
2. Write a C program to multiply two matrices A and B and store the resultant matrix in C using arrays.
3. Write a C program to experiment the operation of STACK using array.
4. Write a C program to create menu driven options to implement QUEUE to perform the following
   (i) Insertion (ii) Deletion (iii) Modification   (iv) Listing of elements
5. Write a C program to create Linked list representations of employee records and do the following operations using pointers.
   (i)  To add a new record.
   (ii) To delete an existing record.
   (iii) To print the details about an employee.
   (iv) To find the number of employees in the structure.

6. Write a C Program to count the total nodes of the linked list and to insert an element at the end of the linked list.
7. Write a C program to insert an element at the beginning of a doubly linked list.
8. Write a C program to display the hash table, using the mid square method.
9. Write a C program to traverse the given binary tree using all traversal methods.
10. Write a C program to insert an element in a binary tree.

**COURSE OUTCOME:**

1. Study all the Basic operation of matrices and stack.

2. Practice the usage of branching and looping statements in hash table.

3. Apply arrays for stack and queue.

4. Analysis the use of pointers for linked list, doubly linked list and tree traverse.

| Subject Title | COMPUTER ORGANIZATION AND ARCHITECTURE | Semester | II |
|---|---|---|---|
| Subject Code | **21UIS03** | Specialization | NA |
| Type | Core: Theory | L:T:P:C | 56:4:0:5 |

**Course Objective:**

1. To know Structure and functions of Computer architecture and organizations.

2. Observe the characteristics of various computer memory concepts.

3. To understand the computer arithmetic and machine instructions.

4. Understand the parallel processing concepts.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Recognize the Basic Number system and logic gates | K1 |
| CO2 | Understanding the flip flops and Karnaugh maps | K2,K3 |
| CO3 | Understand and apply micro operation and data transfer | K3 |
| CO4 | Demonstrate the computer arithmetic and addressing modes. | K3,K4 |
| CO5 | Analyze the memory and I/O organizations. | K3,K4 |

| Subject Title | COMPUTER ORGANIZATION AND ARCHITECTURE | | Semester | II | |
|---|---|---|---|---|---|
| Subject Code | 21UIS03 | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 56:4:0:5 | |
| Unit | Contents | | | Levels | Sessions |
| I | Digital Principles: Definition for digital signals – Digital waveforms – Digital logic – Moving and Storing Digital Information – Digital Operations – Digital computers – Digital Integrated Circuits. Digital Logic: The Basic Gates - NOT, OR, AND –Universal Logic Gates – NOR, NAND – AND-OR-Invert Gates – Positive and Negative Logic. | | | K1 | 12 |
| II | Combinational Logic Circuits: Boolean Laws And Theorems – Sum-of-products Method – Truth Table to Karnaugh Map – Pairs, Quads, and Octets – Karnaugh Simplification – Don't-care Conditions – Product-of-sums Simplification. Data–Processing Circuits: 16-to-1 Multiplexer – 1-to-16 De-multiplexer – BCD-to-decimal Decoder – Decimal-to-BCD Encoder – Exclusive-or Gates – Parity Generation and Application. | | | K2,K3 | 12 |
| III | Number Systems and Codes: Binary Number System – Binary-to-decimal Conversion – Decimal-to- binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code. Arithmetic Circuits: Binary Addition –Binary Subtraction –Unsigned Binary Numbers – Sign-magnitude Numbers - 2'S Complement Representation - 2'S Compliment Arithmetic. | | | K2,K3 | 12 |
| IV | Arithmetic Circuits: Arithmetic Building Blocks – The Adder - subtractor – Fast Adder – Arithmetic Logic Unit – Binary Multiplication and Division. Clocks and Timing Circuits: Clock Waveforms. Flip- Flops: RS Flip-flops – Edge-triggered D Flip-flops - Edge triggered JK Flip-flops – JK Master-slave Flip-flops. | | | K3,K4 | 12 |
| V | Registers: Serial-In Serial-Out – Serial-In Parallel-Out – Parallel-In Serial-Out – Parallel-In Parallel-Out. Memory: Introduction - Magnetic Memory - Optical Memory - Memory Addressing - ROMs, PROMs, EPROMs and EEPROM – RAMs. A Simple Computer Design. | | | K3,K4 | 12 |
| | Learning Resources | | | | |
| Text Books | Donald P Leach, Albert Paul Malvino and Goutam Saha, –Digital Principles and Applications,‖ 8th Edition, TMH, 2006. | | | | |

| Reference Books | 1. Morris Mano, "Digital Logic and Computer Design," 4th Edition, Pearson, 2008 |
| | 2. Thomas C Bartee, "Digital Computer Fundamentals," sixth edition, McGraw-Hill, 1985 |
| | 3. Pradeep K. Sinha, Priti Sinha , "Computer Fundamentals," Sixth Edition, BPB Publications, 2007 |
| Website / Link | www.javatpoint.com/computer-organization-and-architecture-tutorial |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|-----------|-----|-----|-----|-----|
| CO1 | S | S | S | - |
| CO2 | S | M | M | S |
| CO3 | S | L | L | M |
| CO4 | M | S | M | S |
| CO5 | S | L | S | S |

S- Strong , M- Medium , L – Low

| Subject Title | **RELATIONAL DATABASE MANAGEMENT SYSTEMS** | Semester | III |
|---|---|---|---|
| **Subject Code** | **21UIS04** | **Specialization** | **NA** |
| **Type** | **Core: Theory** | **L:T:P:C** | **41:3:0:5** |

**Course Objective:**

1. Understand the basic concept of Data Base and database management system.
2. Understand and apply the SQL fundamentals.
3. Evaluate the Relational database design.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the concept of database. | K1 |
| CO2 | Understanding the data models and ER Diagram. | K2 |
| CO3 | Apply SQL commands. | K2, K3 |
| CO4 | Evaluate the DBMS in SQL. | K3,K4 |
| CO5 | Analyze the Transaction management. | K5 |

| Subject Title | RELATIONAL DATABASE MANAGEMENT SYSTEMS | Semester | III |
|---|---|---|---|
| Subject Code | **21UIS04** | Specialization | NA |
| Type | Core: Theory | L:T:P:C | 41:3:0:5 |
| Unit | Contents | Levels | Sessions |
| I | Introduction: Database System Applications-Purpose of Database Systems-View of Data-Database Languages-Transaction Management-Database Architecture-Database users and Administrators. Relational Model: Structure of Relational Databases – Database Design – ER Model-Overview of the Design Process – The Entity – relationship Model – Constraints – Entity Relationship Diagrams. | K1 | 6 |
| II | Relational Algebra Operations –Relational Languages: The Tuple Relational Calculus –The Domain Relational Calculus – SQL: Background – Data Definition – Basic Structure of SQL Queries – Set Operations – Aggregate Functions – Null Values – Nested Sub-Queries – Views – Modification of the Database. | K2 | 9 |
| III | Data Normalization: Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Normalization – First Normal Form – Second Normal Form – Third Normal Form – Boyce-Codd Normal Form – Fourth Normal Form – Fifth Normal Form – De-normalization – Database Security: Data Security Requirements – Protecting the Data within the Database – Granting and Revoking Privileges – Data Encryption. | K2,K3 | 9 |
| IV | PL/SQL: A programming Language: History - Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L IN PL/SQL – Data Manipulation-Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. | K3,K4 | 9 |
| V | PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages - Triggers – Data Dictionary Views. | K5 | 8 |
| | **Learning Resources** | | |
| **Text Books** | 1.      ‒Database System Concepts‖,Abraham Silberschatz, Henry F.Korth, S.Sudarshan, TMH 5th Edition (Units – I,II) 2.      ‒Fundamentals of Database Management Systems‖, Alexis Leon, Mathews Leon, Vijay Nicole Imprints Private Limited. (Unit-III) 3.      ‒Database Systems Using Oracle‖ Nilesh Shah,2nd edition,PHI.UNIT-IV: | | |

| | |
|---|---|
| | Chapters 10 & 11 UNIT-V:Chapters 12,13 & 14. |
| **Reference Books** | Alexix Leon & Mathews Leon, "Essential of DBMS", 2nd reprint, Vijay Nicole Publications, 2009. |
| **Website / Link** | 1.https://www.w3schools.com/sql <br> 2. https://www.tutorialspoint.com/sql <br> 3. https://livesql.oracle.com |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | S | - |
| **CO2** | S | M | M | S |
| **CO3** | S | L | L | M |
| **CO4** | M | S | M | S |
| **CO5** | S | L | S | S |

S- Strong , M- Medium , L – Low

| Subject Title | PRACTICAL III – SQL and PL/SQL | Semester | III |
|---|---|---|---|
| Subject Code | 21UISP03 | Specialization | NA |
| Type | Core: Practical | L:T:P:C | 30:0:2:2 |

**Course Objective :**

1. To impart Practical Training in DDL Commands.

2. Familiarize the different DML Commands.

3. Build queries with SQL Commands.

4. Provide knowledge on working with big tables.

## LIST OF PROGRAMS:

NOTE : Demonstrate the following SQL commands and can take any back end RDBMS system

for  implementation purpose.

1. Data Definition of Base Tables.

2. DDL with Primary key constraints.

3. DDL with constraints and verification by insert command.

4. Data Manipulation of Base Tables and Views.

5. Demonstrate the Query commands.

6. Write a PL/SQL code block that will accept an account number from the user and debit an amount of Rs. 2000 from the account if the account has  a minimum balance of 500 after the amount is debited. The Process is to fire on the Accounts table.

7. Write a PL/SQL code block to calculate the area of the circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in a table Areas. Areas – radius, area.

8. Write a PL/SQL block of code for reversing a number. (Example : 1234 as 4321).

**9.**  Create a transparent audit system for a table Client_master (client_no, name, address, Bal_due). The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operation are stored in the audit client (client_no, name, bal_due, operation, userid, opdate) table, then the delete or update is allowed to go through**.**

## COURSE OUTCOME:

1. Study all the Basic DDL and DML Commands.

2. Practice the usage of SQL Statements.

3. Apply PL/SQL code  usage.

4. Analysis the use of PL/SQL for complex problems.

| Subject Title | **OPERATING SYSTEM** | Semester | III |
|---|---|---|---|
| **Subject Code** | **21UIS05** | **Specialization** | **NA** |
| **Type** | **Core: Theory** | **L:T:P:C** | **71:5:0:4** |

**Course Objective:**

1. To understand the fundamental concepts and role of Operating System.
2. To learn the Process Management and Scheduling Algorithms.
3. To understand the Memory Management policies.
4. To gain insight on I/O and File management techniques.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Understand the structure and functions of Operating System. | K1 |
| **CO2** | Compare the performance of Scheduling Algorithms. | K2 |
| **CO3** | Understand and organize the memory. | K1,K3 |
| **CO4** | Evaluate the deadlock measures. | K3,K4 |
| **CO5** | Analyze the I/O hardware and software. | K5 |

| Subject Title | **OPERATING SYSTEM** | | Semester | III |
|---|---|---|---|---|
| Subject Code | **21UIS05** | | Specialization | NA |
| Type | **Core: Theory** | | L:T:P:C | **71:5:0:4** |
| Unit | **Contents** | | **Levels** | **Sessions** |
| **I** | Introduction – History of operating system- Different kinds of operating system – Operation system concepts - System calls-Operating system structure. | | **K1** | **15** |
| **II** | Processes and Threads: Processes – threads – thread model and usage – inter process communication. | | **K2** | **15** |
| **III** | Scheduling - Memory Management: Memory Abstraction – Virtual Memory - page replacement algorithms. | | **K1,K3** | **15** |
| **IV** | Deadlocks: Resources- introduction to deadlocks – deadlock detection and recovery – deadlocks avoidance – deadlock prevention. Multiple processor system: multiprocessors – multi computers. | | **K3,K4** | **15** |
| **V** | Input/Output: principles of I/O hardware - principles of I/O software. Files systems: Files – directories - files systems implementation – File System Management and Optimization. | | **K5** | **11** |
| | **Learning Resources** | | | |
| **Text Books** | Andrew S. Tanenbaum, ‒Modern Operating Systems‖, 2ndEdition, PHI private Limited, New Delhi, 2008. | | | |
| **Reference Books** | 1. William Stallings, ―Operating Systems – Internals & Design Principles‖, 5th Edition, Prentice – Hall of India private Ltd, New Delhi, 2004. <br> 2. Sridhar Vaidyanathan, ‒Operating System‖, 1st Edition,Vijay Nicole Publications, 2014. | | | |
| **Website / Link** | 1. www.wikipedia.org/wiki/Operating_system <br> 2. http://www.freetechbooks.com/introduction-to-operating-systems-t340.html | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | S | - |
| **CO2** | S | M | M | S |
| **CO3** | S | L | L | M |
| **CO4** | M | S | M | S |
| **CO5** | S | L | S | S |

S- Strong , M- Medium , L – Low

| Subject Title | **SBEC I - OFFICE AUTOMATION LAB** | **Semester** | **III** |
|---|---|---|---|
| Subject Code | **21UISSP01** | **Specialization** | **NA** |
| Type | **SBEC: Practical** | **L:T:P:C** | **30:0:2:3** |

**Course Objective:**

1. To acquire knowledge on editor, spread sheet and slide preparation.
2. To improve creative thinking in presentation software.

**LIST OF PROGRAMS:**
**I. MS-WORD**

1. Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text.

2. Bio data: Prepare a Bio-data.

3. Find and Replace: Write a paragraph about yourself and do the following. Find and Replace - Use Numbering Bullets, Footer and Headers.

4. Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.

5. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare at least five letters.

**II. MS-EXCEL**

1. Data sorting-Ascending and Descending (both numbers and alphabets).
2. Mark list preparation for a student.
3. Individual Pay Bill preparation.
4. Invoice Report preparation.
5. Drawing Graphs. Take your own table.

**III. MS-POWERPOINT**

1. Create a slide show presentation for a seminar.
2. Preparation of Organization Charts.
3. Create a slide show presentation to display percentage of marks in each semester for all students

    (i) Use bar chart (X-axis: Semester, Y-axis: % marks).

    (ii) Use different presentation template different transition effect for each slide.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the concept of word processing. | K1 |
| CO2 | Understanding the tools in Micro soft word. | K2 |
| CO3 | Understand and Apply Excel Features. | K3 |
| CO4 | Evaluate the EXCEL functions. | K3,K4 |
| CO5 | Analyze the different designs of MS Presentations. | K5 |

| Subject Title | **PROGRAMMING IN JAVA** | Semester | IV |
|---|---|---|---|
| Subject Code | **21UIS06** | Specialization | NA |
| Type | **Core: Theory** | **L:T:P:C** | **60:4:0:4** |

**Course Objective:**

1. To understand the concepts of Object Oriented Programming.
2. To learn about the control structures, class with attributes and methods used in Java.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the concepts of OOPS. | K1 |
| CO2 | Understand the basic Terminologies of languages and statements. | K2 |
| CO3 | Demonstrate the use classes and objects. | K2,K3 |
| CO4 | Evaluate the packages and exception handling methods. | K3,K4 |
| CO5 | Analyze the I/O Streams and graphics classes. | K5 |

| Subject Title | PROGRAMMING IN JAVA | | Semester | IV | |
|---|---|---|---|---|---|
| Subject Code | **21UIS06** | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 60:4:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| I | Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Benefits of OOPs – Application of OOPs. Java: History – Java features – Java Environment – JDK – API. Introduction to Java: Types of java program – Creating and Executing a Java program – Java Tokens- Java Virtual Machine (JVM) – Command Line Arguments –Comments in Java program. | | | K1 | 10 |
| II | Elements: Constants – Variables – Data types - Scope of variables – Type casting – Operators: Special operators – Expressions – Evaluation of Expressions. Decision making and branching statements- Decision making and Looping– break – labeled loop – continue Statement. Arrays: One Dimensional Array – Creating an array – Array processing – Multidimensional Array – Vectors – ArrayList – Advantages of Array List over Array Wrapper classes. | | | K2 | 10 |
| III | Class and objects: Defining a class – Methods – Creating objects – Accessing class members – Constructors – Method overloading – Static members –Nesting of Methods – this keyword – Command line input. Inheritance: Defining inheritance –types of inheritance– Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control- Interfaces: Defining interface – Extending interface - Implementing Interface - Accessing interface variables. Strings: String Array – String Methods – String Buffer Class. | | | K2,K3 | 10 |
| IV | Packages: Java API Packages – System Packages – Naming Conventions –Creating & Accessing a Package – Adding Class to a Package – Hiding Classes. Exception Handling: Limitations of Error handling – Advantages of Exception Handling - Types of Errors – Basics of Exception Handling – try blocks – throwing an exception – catching an exception – finally statement. Multithreading: Creating Threads – Life of a Thread – Defining & Running Thread – Thread Methods – Thread Priority – Synchronization –Implementing Runnable interface – Thread Scheduling. | | | K3,K4 | 15 |
| V | I/O Streams: File – Streams – Advantages - The stream classes – Byte streams –Character streams. Applets: Introduction – Applet Life cycle – Creating & Executing an Applet –Applet tags in | | | K5 | 15 |

| | | | |
|---|---|---|---|
| | HTML – Parameter tag – Aligning the display - Graphics Class: Drawing and filling lines – Rectangles – Polygon – Circles – Arcs – Line Graphs – Drawing Bar charts AWT Components and Even Handlers: Abstract window tool kit – Event Handlers – Event Listeners – AWT Controls and Event Handling: Labels – Text Component – Action Event – Buttons – Check Boxes – Item Event – Choice– Scrollbars – Layout Managers- Input Events – Menus. | | |
| | **Learning Resources** | | |
| **Text Books** | 1. E. Balagurusamy, ‒*Programming with Java‖*, TataMc-Graw Hill, 5<sup>th</sup> Edition. <br> 2. Sagayaraj, Denis, Karthick and Gajalakshmi, ‒*Java Programming for Core and advanced learners‖*, Universities Press (INDIA) Private Limited 2018. | | |
| **Reference Books** | Herbert Schildt, ‒*The complete reference Java‖*, TataMc-Graw Hill, 7<sup>th</sup> Edition. | | |
| **Website / Link** | 1. NPTEL & MOOC courses titled Java <br> https://nptel.ac.in/courses/106105191/ <br> 2. https://www.geeksforgeeks.org/ <br> 3. https://www.tutorialspoint.com/java/ | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | S | S | - |
| CO2 | S | M | M | S |
| CO3 | M | S | L | M |
| CO4 | M | S | M | S |
| CO5 | S | S | - | - |

S- Strong , M- Medium , L – Low

| Subject Title | **PRACTICAL IV- JAVA PROGRAMMING** | Semester | IV |
|---|---|---|---|
| Subject Code | **21UISP04** | Specialization | NA |
| Type | **Core: Practical** | L:T:P:C | 45:0:3:2 |

**Course Objective :**

1. To impart Practical Training in JAVA Programming Language.

2. Familiarize the different control and decision making statements in JAVA.

3. Build programs using Packages.

4. Provide knowledge on working with Exception handling functions.

**LIST OF PROGRAMS:**

1 Write a program to find the Area of Square, Rectangle and Circle using Method Overloading.

2 Write a program to sort the list of numbers using Command Line Arguments.

3 Write a program to multiply the given two matrices.

4 Write a program to design a class to represent a bank account. Include the following:

Data Members: Name of the depositor, Account number, Type of account, and Balance amount in the account.

Methods: To assign initial values, To deposit an amount, To withdraw an amount after checking balance, and To display the name and balance.

5 Write a program that import the user defined package and access the Member variable of classes that contained by Package.

6 Write a program to handle the Exception using try and multiple catch blocks.

7 Write a program to illustrate the use of multi threads.

8 Write a program to create student registration form using applet with Name, Address, Sex, Class, Email-id.

9 Write a program to draw the line, rectangle, oval, text using the graphics method.

10 Write a program to create a sequential file that could store details about five products. Details include product code, cost, and number of items available and are provided through the keyboard. Compute and print the total value of all the five products

**COURSE OUTCOME:**

1. Study all the Basic Statements in java Programming.

2. Practice the usage of branching and looping statements.

3. Apply Packages and Interfaces.

4. Analysis the use of graphics tools in JAVA.

**B.Sc.( Computer Science) / BCA / B.Sc.(Information Science)**

# Semester IV: Add-on Course
# Internship Programme

**OBJECTIVES:**

- To make students acquire practical knowledge by going to a company and learn in a live environment
- To make students learn team work and work ethics
- To make students to know the recent trends in Web/Mobile Application Development, Networking or any other area relevant to their study
- To make students analyse their skills and interests
- To help students examine academic and career goals

**OUTCOME**:

At the end of this internship programme the students will be able to

- apply theory to real life
- work as a part of team
- learn from the company experts
- learn latest trending technologies
- come out with a high morale
- enrich CV

**About the internship programme:** The internship programme provides students with practical, real-world experience and a valuable complement to their academic training. It enhances the students' skills in problem solving by making him/her work in a live environment in which systematic problem solving methods are practised.

**Duration**:Internship requires students to spend a minimum of 15 days (during vacation)employed, full-time, as IT interns or trainees during vacation at the end of fourth semester. During this period, they are engaged in work of direct relevance to their programme of study.

**Areas**: Some of the fields that are open to students include:

- Online Publishing and Editing
- Online Advertising
- Web/Mobile Application Development
- E-Marketing / Online Marketing
- Any other field related to Computer Science / Applications / Information Science

**Certificate:** A certificate is to be obtained from the organization in which the student undergoes internship programme. This certificate is to be submitted to the college within fifteen days after the college reopens for the next semester.

**Credits:** The Internship programme does not carry any credit.

| Subject Title | **INFORMATION SECURITY** | Semester | V |
|---|---|---|---|
| Subject Code | 21UIS07 | Specialization | NA |
| Type | Core: Theory | L:T:P:C | 71:5:0:4 |

**Course Objective:**

1. Understand the basics of information security.

2. Able to manage the information and detects threats and vulnerabilities that are affecting the data.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of security. | K1 |
| CO2 | Understand organizational security. | K2 |
| CO3 | Demonstrate the protection of information. | K3 |
| CO4 | Study the protection of system. | K4 |
| CO5 | Analyze cloud computing security. | K5 |

| Subject Title | INFORMATION SECURITY | | Semester | V | |
|---|---|---|---|---|---|
| Subject Code | 21UIS07 | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 71:5:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| I | The Language of Security- Threats and Vulnerabilities: Threats- Physical Threats- Vulnerabilities- The Information Security Manager - Information Security Job Roles -Training, Experience, and Professionalism- Getting Started in Security Management | | | K1 | 15 |
| II | Organizational Security : Security in Organizational Structures- Working with Specialist Groups -Working with Standards and Regulations-Working with Risk Management- Working with Enterprise Architecture-Working with Facilities Management- Information Security Implementation: Integration with Risk Management- Secure Development- Standards, Frameworks, Guidelines, and Legislation: Why Do We Need Standards? – Legislation- The ISO/IEC 27000 Series of Standards - Business Continuity -Risk Management Standards - COBIT - Payment Card Industry Data Security Standard - Health Insurance Portability and Accountability Act | | | K2 | 15 |
| III | Protection of Information : Information Classification- Identification, Authentication, and Authorization- Protection of People: Human Vulnerabilities- Building a Security Culture - Personnel Security Life Cycle - Protection of Premises: What Is Physical Security?- Start with a Risk Assessment- Perimeter Design- Internal Building Security | | | K3 | 15 |
| IV | Protection of Systems -Introducing Malware- Threat Vectors-- Technical Countermeasures - Network Security- Digital Evidence and Incident Response : The Digital Forensic Process- Forensic Readiness- Incident Response and Digital Investigations- Investigating a Malware Outbrea | | | K4 | 15 |
| V | Cloud Computing Security: Cloud Computing 101- Cloud Security - Cloud Security Architectures-API Security: An Old Threat with New Targets – Virtualization- Industrial Control Systems: ICS Architectures- ICS Security- Secure Systems Development: Secure Development- Secure Development Business Processes- Security Testing- Auditing | | | K5 | 11 |
| | **Learning Resources** | | | | |
| Text Books | Tony Campbell Burns Beach , Practical Information Security Management: A Complete Guide to Planning and Implementation ,Apress, 2016 (http://file.allitebooks.com/20161204/Practical%20Information%20Security%20Management.pdf) | | | | |
| Reference Books | 1.Mark Rhodes Ousley, The Information security the complete Reference , Second Edition ,2013<br>2. Josiah Dykstra ,Essential Cyber Security Science, First Edition, 2016 | | | | |
| Website/ Link | www.geeksforgeeks.org/Informationsecurity | | | | |

**Mapping with Programme Outcomes**

| CO Number | PS01 | PS02 | PS03 | PS04 |
|-----------|------|------|------|------|
| CO1 | S | M | M | L |
| CO2 | M | M | L | L |
| CO3 | S | M | L | M |
| CO4 | M | S | M | L |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

| Subject Title | WEB TECHNOLOGY | | Semester | V |
|---|---|---|---|---|
| Subject Code | 21UIS08 | | Specialization | NA |
| Type | Core: Theory | | L:T:P:C | 71:5:0:4 |

**Course Objective:**

1. To understand the fundamental concepts and role of Web Technology.
2. To learn the Process of CSS.
3. To understand the web pages.
4. To gain insight on script objects.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the structure the documents in Web. | K1 |
| CO2 | Remember and understand the table handling tags. | K2 |
| CO3 | Understand and organize CSS. | K1,k3 |
| CO4 | Implement scripts in web page. | K3,K4 |
| CO5 | Evaluate script objects. | K5 |

| Subject Title | WEB TECHNOLOGY | | Semester | V | |
|---|---|---|---|---|---|
| Subject Code | 21UIS08 | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 71:5:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| I | Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups. Links and Navigation: Basic Links, Creating Links with the <a> Element, Advanced E- mail Links. Images, Audio, and Video: Adding Images Using the <img> Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages. | | | K1 | 15 |
| II | Tables: Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables. Forms: Introducing Forms, Form Controls, Sending Form Data to the Server. Frames: Introducing Frameset, <frame> Element, Creating Links Between Frames, Setting a Default Target Frame Using <base> Element, Nested Framesets, Inline or Floating Frames with <iframe>. | | | K2 | 15 |
| III | Cascading Style Sheets: Introducing CSS, Where you can Add CSS Rules. CSS Properties: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model. More Cascading Style Sheets: Links, Lists, Tables, Outlines, The :focus and :activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules, Positioning and Layout wit, Page Layout CSS , Design Issues. | | | K1,K3 | 15 |
| IV | Java Script: How to Add Script to Your Pages, Variables and Data Types – Statements and Operators, Control Structures, Conditional Statements, Loop Statements – Functions - Message box, Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes | | | K3,K4 | 15 |
| V | Working with JavaScript: Practical Tips for Writing Scripts, JavaScript Objects: Window Object - Document object - Browser Object - Form Object - Navigator object Screen object - Events, Event Handlers, Forms – Validations, Form Enhancements, JavaScript Libraries. | | | K5 | 11 |
| | **Learning Resources** | | | | |
| Text Books | Jon Duckett, Beginning HTML, XTML, CSS and Java script , Wiley Publishing | | | | |
| Reference Books | 1.Chris Bates, ―Web Programming‖, Wiley Publishing 3d Edition. 2. M. Srinivasan, ―Web Technology: Theory and Practice‖, Pearson Publication | | | | |
| Website/Link | www.geeksforgeeks.org/webtechnology | | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|:---:|:---:|:---:|:---:|:---:|
| CO1 | S | S | S | - |
| CO2 | S | M | M | S |
| CO3 | S | L | L | M |
| CO4 | M | S | M | S |
| CO5 | S | L | S | S |

S-  Strong , M- Medium , L – Low

| Subject Title | **PRACTICAL V : WEB TECHNOLOGY LAB** | **Semester** | **V** |
|---|---|---|---|
| Subject Code | **21UISP05** | **Specialization** | **NA** |
| Type | **Core: Practical** | **L:T:P:C** | **45:0:3:2** |

**Course Objectives:**

1. To impart Practical Training in Control panel tools.
2. Familiarize with HTML Tags.
3. Build programs using Java script.
4. Provide knowledge on working with events and methods.

**LIST OF PROGRAMS:**

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and so on). Write JavaScript code to count the number of elements in a form.

2. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the Text boxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.

3. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.

4. Create a page with dynamic effects. Write the code to include layers and basic animation.

5. Write a JavaScript code to find the sum of N natural Numbers. (Use user-defined function)

6. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.

7. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.

8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.

9. Create a form consists of a two Multiple choice lists and one single choice list
   (a)The first multiple choice list, displays the Major dishes available (b)The second multiple choice list, displays the Starters available. (c)The single choice list, displays the Soft drinks available.

**COURSE OUTCOME:**

1. Study all the Basic tools.

2. Practice the usage of web page creation and useable objects.

3. Apply various effects on webpage.

4. Analysis the use of java script and html code.

| Subject Title | **OPEN SOURCE TECHNOLOGY** | Semester | V |
|---|---|---|---|
| **Subject Code** | **21UIS09** | **Specialization** | **NA** |
| **Type** | **Core: Theory** | **L:T:P:C** | **71:5:0:4** |

**Course objective:**

1. To use PHP and MySQL to develop dynamic web sites for user on the Internet.
2. To develop web sites ranging from simple online information forms to complex e-commerce sites with MySQL database, building, connectivity, and maintenance.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Understand the relationship with open source and free software. | K1 |
| **CO2** | Understand the flow control in programs. | K2 |
| **CO3** | Implement Arrays. | k3 |
| **CO4** | Evaluate functions and classes. | K4 |
| **CO5** | Analyze database and SQL. | K5 |

| Subject Title | OPEN SOURCE TECHNOLOGY | | Semester | V | |
|---|---|---|---|---|---|
| Subject Code | 21UIS09 | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 71:5:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| I | Introduction: Open Source, Free Software, Free Software vs. Open Source software Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators. | | | K1 | 15 |
| II | Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions. | | | K2 | 15 |
| III | Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times. | | | K3 | 15 |
| IV | Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files- Processing Directories. | | | K4 | 15 |
| V | Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data- Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML - Simple XML and DOM Extension. | | | K5 | 11 |
| | **Learning Resources** | | | | |
| Text Books | VikramVaswani, ―PHP A Beginner's Guide‖, Tata McGraw Hill 2008. | | | | |
| Reference Books | Steven Holzner , ‒The PHP Complete Reference‖, Tata McGraw Hill, 2007. Steven Holzer , ‒Spring into PHP‖, Tata McGraw Hill 2011, 5thEdition. | | | | |
| Website / Link | 1.    https://www.w3schools.com/php/<br><br>2.    https://www.phptpoint.com/php-tutorial-pdf/ | | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | S | M | --- |
| CO2 | M | M | M | S |
| CO3 | S | M | L | M |
| CO4 | M | S | M | S |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

| Subject Title | PRACTICAL VIII : OPEN SOURCE TECHNOLOGY LAB | Semester | V |
|---|---|---|---|
| Subject Code | 21UISP06 | Specialization | NA |
| Type | Core: Practical | L:T:P:C | 60:0:4:2 |

**Course Objectives:**

1. To develop technical solutions for problems using the open source software's readily available at free of cost.
2. To install Wamp Server .

3. Provide knowledge on working with PHP SCRIPTS.

**LIST OF PROGRAMS**

1.    Create a simple HTML form and accept the user name and display the name through PHP echo statement.

2.    Write a PHP script to redirect a user to a different page.

3.    Write a PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator.

4.    Create a PHP script which display the capital and country name from the given array. Sort the list by the name of the country.

5.    Write a PHP script to calculate and display average temperature, five lowest and highest temperatures.

6.    Create a script using a for loop to add all the integers between 0 and 30 and display the total.

7.    Write a PHP script using nested for loop that creates a chess board.

8.    Write a PHP function that checks if a string is all lower case.

9.    Write a PHP script to calculate the difference between two dates.

10.    Write a PHP script to display time in a specified time zone.

**COURSE OUTCOME:**

1. Know all The Basic commands

2. Practice the usage of html Tags and PHP statements.

3. Apply various commands in PHP for simple programs

4. Analysis the use of time and date operations.

| Subject Title | **SBEC III : MOBILE APPLICATION DEVELOPMENT** | Semester | V |
|---|---|---|---|
| **Subject Code** | **21UISSP03** | **Specialization** | **NA** |
| **Type** | **SBEC: Practical** | **L:T:P:C** | **45:0:3:3** |

**Course Objectives**

1. To impart Practical Training in android developer tools.

2. Build programs using eclipse environment.

3. Provide knowledge on working with simple android apps.

**LIST OF PROGRAMS:**

1. Sample application about Layouts.

2. Sample application about Internets.

3. Sample application about User Interfaces.

4. Sample application about Animations.

5. Create calculator app in Android.

6. Create sample android Camera Application.

7. Create basic list view demo in Android.

8. Create Google map in Android.

**COURSE OUTCOME:**

1. Study all the Basic Tools.

2. Practice the usage of control panel objects.

3. Apply various commands for layouts and animations.

4. Analysis the use of SQLite I.

| Subject Title | **PROGRAMMING IN PYTHON** | Semester | VI |
|---|---|---|---|
| **Subject Code** | **21UIS10** | **Specialization** | **NA** |
| **Type** | **Core: Theory** | **L:T:P:C** | **86:6:0:5** |

**Course Objective:**
1. To understand the basic components of computer programming using the Python language.
2. To demonstrate significant experience with the Python program development environment.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Understand the Basic Programming Logic. | K1 |
| **CO2** | Understand the basic Statements. | K2 |
| **CO3** | Implement Files and SQL. | K3 |
| **CO4** | Evaluate Graphics in python. | K4 |
| **CO5** | Analyze Version control system. | K5 |

**B.Sc- Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards**

| Subject Title | PROGRAMMING IN PYTHON | | Semester | VI | |
|---|---|---|---|---|---|
| Subject Code | 21UIS10 | | Specialization | NA | |
| Type | Core: Theory | | L:T:P:C | 86:6:0:5 | |
| Unit | Contents | | | Levels | Sessions |
| I | Python – origins – features – variable and assignment - Python basics – statement and syntax – Identifiers – Basic style guidelines – Python objects – Standard types and other built-in types – Internal types – Standard type operators – Standard type built-in functions. | | | K1 | 15 |
| II | Numbers – Introduction to Numbers – Integers – Double precision floating point numbers – Complex numbers – Operators – Numeric type functions – Sequences: Strings, Lists and Tuples – Sequences – Strings and strings operators – String built-in methods – Lists – List type Built in Methods – Tuples. | | | K2 | 11 |
| III | Mapping type: Dictionaries – Mapping type operators – Mapping type Built-in and Factory Functions - Mapping type built in methods – Conditionals and loops – if statement – else Statement – elif statement – conditional expression – while statement – for statement – break statement – continue statement – pass statement – Iterators and the iter( ) function - Files and Input/Output – File objects – File built-in functions – File built-in methods – File built-in attributes – Standard files – command line arguments. | | | K3 | 20 |
| IV | Functions and Functional Programming – Functions – calling functions – creating functions – passing functions – Built-in Functions: apply( ), filter( ), map( ) and reduce( ) - Modules – Modules and Files – Modules built-in functions - classes – class attributes – Instances. | | | K4 | 20 |
| V | Database Programming – Introduction - Basic Database Operations and SQL - Example of using Database Adapters, Mysql - Regular Expression – Special Symbols and Characters – REs and Python. | | | K5 | 20 |
| | **Learning Resources** | | | | |
| Text Books | Title of Book Publisher Year of Publication 1 Wesley J. Chun Core Python Programming Pearson Education Publication 2012 | | | | |
| Reference Books | 1     Wesley J. Chun Core Python Application Programming Pearson Education Publication 2015<br>2     Eric Matthes Python crash course William pollock 2016<br>3     Zed Shaw Learn Python the hard way Addition Wesley 2017<br>4     Mark Lutz Python pocket reference O'Reilly Media 2014 Pedagogy | | | | |
| Website / Link | 1.https://www.tutorialspoint.com/python/<br>2.www.spoken-tutorial.org | | | | |

**B.Sc- Information Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards**

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|-----------|-----|-----|-----|-----|
| CO1 | S | S | M | --- |
| CO2 | M | M | M | S |
| CO3 | S | M | L | M |
| CO4 | M | S | M | S |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

| Subject Title | **PYTHON PROGRAMMING** | **Semester** | **VI** |
|---|---|---|---|
| Subject Code | **21UISP07** | **Specialization** | **NA** |
| Type | **Core: Practical** | **L:T:P:C** | **60:0:4:3** |

**Course Objectives:**

1. To impart Practical Training in basic python statements.
2. Familiarize with control flow tools.
3. Build programs using data structure concepts.
4. Provide knowledge on working with exception and string handling.

**LIST OF PROGRAMS:**

1. Create a simple calculator to do all the arithmetic operations.
2. Write a program to use control flow tools like if.
3. Write a program to use for loop.
4. Data structures
   a. use list as stack.
   b. use list as queue.
   c. tuple, sequence.
5. Create new module for mathematical operations and use in your program.
6. Write a program to read and write files, create and delete directories.
7. Write a program with exception handling.
8. Write a program using classes.
9. Connect with MySQL and create address book
10. Write a program using string handling and regular expressions

**COURSE OUTCOME:**

1. Study all the Basic commands.
2. Practice the usage of control flow statements.
3. Apply various commands in files and directories.
4. Analysis the use of MYSQL to connect database.

| Subject Title | **QUANTITATIVE APTITUDE** | Semester | VI |
|---|---|---|---|
| **Subject Code** | **21UISS01** | **Specialization** | **NA** |
| **Type** | **Theory** | **L:T:P:C** | **41:3:0:3** |

**Course Objective:**
1. To improve the quantitative skills of the students.
2. To prepare the students for various competitive exams.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basic mathematical functions. | K1 |
| **CO2** | Understand the problems of ages , profits and loss. | K2 |
| **CO3** | Demonstrate the relationship of time with work and distance. | k3 |
| **CO4** | Implement permutation and combinations problem. | K4 |
| **CO5** | Analyze data representation methods. | K5 |

| Subject Title | QUANTITATIVE APTITUDE | | Semester | VI | |
|---|---|---|---|---|---|
| Subject Code | 21UISS01 | | Specialization | NA | |
| Type | SBEC: Theory | | L:T:P:C | 41:3:0:3 | |
| Unit | Contents | | | Levels | Sessions |
| I | Numbers - HCF and LCM of numbers - Decimal fractions - Simplification - Square roots and cube roots - Average - problems on Numbers. | | | K1 | 8 |
| II | Problems on Ages - Surds and Indices - percentage - profits and loss - ratio and proportion - partnership - Chain rule. | | | K2 | 8 |
| III | Time and work - pipes and cisterns - Time and Distance - problems on trains - Boats and streams - simple interest - compound interest - Logarithms - Area - Volume and surface area - races and Games of skill. | | | K3 | 8 |
| IV | Permutation and combination - probability - True Discount - Bankers Discount - Height and Distances - Odd man out & Series. | | | K4 | 8 |
| V | Calendar - Clocks - stocks and shares - Data representation - Tabulation - Bar Graphs - Pie charts - Line graphs. | | | K5 | 9 |
| | **Learning Resources** | | | | |
| Text Books | ‒Quantitative Aptitude‖, R.S. AGARWAL., S. Chand & Company Ltd., | | | | |
| Reference Books | ‒Quantitative Aptitude for Competitive examinations‖ Abhijit Guha – 4th edition – Tata MH | | | | |
| Website / Link | 1.https://textbook.com/aptitude 2.www.carrierbless.com/aptitude/qa/home.php | | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | S | M | --- |
| CO2 | M | M | M | S |
| CO3 | S | M | L | M |
| CO4 | M | S | M | S |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

## MINI PROJECT

### III YEAR / VI SEM

**OBJECTIVES:**
The aim of the mini project is that the student has to understand the real time software development environment. The student should gain a thorough knowledge in the problem and language / software which he/she has selected for their project work.

**Project Planning:**
B.Sc (Computer Science / Information Science)/BCA Mini Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions of project should be completed in the first term of final year.

**I Selection of Team**
To meet the stated objectives, it is imperative that mini project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with Two members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit the report.

**II Selection of Tools**
No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

**III Project Evaluation:**

|  |  |  |
|---|---|---|
| Continuous Internal Assessment | : | 40 Marks |
| Evaluation (External) | : | 40 Marks |
| Viva-voce (jointly) | : | 20 Marks |

There shall be a common written examination conducted for all the candidates in each group together for a minimum of 10 minutes.
  (i)    Requirement Specification of Project
  (ii)    Design of Project
  (iii)    Testing and Implementation of Project

**IV REGULATIONS OF PROJECT WORK**

- Three copies of the project report must be submitted by each student..
- The final outer dimensions of the project report shall be 21cm X 30 cm.

- Only hard binding should be done. The text of the report should be set in 12 pt, Times New Roman, 1.5 spaced.
- Headings should be set as follows: CHAPTER HEADINGS 16 pt, Arial, Bold, All caps, Centered.
- Section Headings 14 pt Bookman old style, Bold, Left adjusted.
- Section Sub-heading 12 pt, Bookman old style.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.
- Only 1.5 space need be left above a section or subsection heading and no space may be left after them.
- References shall be IEEE format (see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.
- The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the First Week of December.
- Periodically the project should be reviewed.
- A Sample format is enclosed in Annexure-II.
- Format of the Title page and Certificate are enclosed in Annexure III.
- The students may use power point presentation during their viva voce examination.

**ANNEXURE - I**

### PERIYAR UNIVERSITY

Name of  the College          :

Programme                          :

Name of  the Student          :

Register Number                 :

Title of the  Project Work    :

Address of Organization / Institution :


Name of the Internal Guide    :

Qualification                        :


Place :

Date :                                                          Signature of Internal Guide

**CONTENTS**

*A. Format of the title page*

TITLE OF THE PROJECT WORK

A Project Work submitted in partial fulfillment of

the requirements for the degree of

**Bachelor of Science in Computer
Science/Information Science**

to the

**Periyar University, Salem - 11**

By

*NAME OF THE*

*STUDENT REG. NO.*
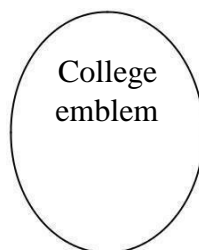
College
emblem

*COLLEGE NAME*

**(AFFILIATED TO PERIYAR UNIVERSITY)**

PLACE with Pin Code

**MONTH – YEAR**

*B. Format of the Certificate*

Name and Address of the Internal Guide

Date

## CERTIFICATE

This is to certify that the Project Work entitled _____

submitted in partial fulfillment of the requirements of the degree of Bachelor of Science in Computer

Sciences/Information Science/Computer Applications to the Periyar University, Salem is a record of

bonafide work carried out by .....................………… Reg. No. under my supervision and guidance.

Internal Guide

Head of the Department

Date of Viva-voice:

Internal Examiner                                                                        External Examiner

## ELECTIVE I

| Subject Title | SEMESTER – V PAPER – I ARTIFICIAL INTELLIGENCE | Semester | V |
|---|---|---|---|
| Subject Code | 21UISE01 | Specialization | NA |
| Type | Elective : Theory | L:T:P:C | 71:5:0:4 |

**Course Objective:**

1. To make the student understand the concepts of Artificial Intelligence.

2. To familiar with various AI Techniques and Expert Systems.
3. To have enriched knowledge regarding heuristic search, Knowledge representation and Expert systems

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basic concepts of Artificial Intelligence. | K1 |
| CO2 | Understanding Heuristic Search techniques. | K1,K2 |
| CO3 | Apply Knowledge representations. | K3 |
| CO4 | Evaluate Using Predicate Logic. | K4 |
| CO5 | Implement Expert System. | K5 |

| Subject Title | SEMESTER – V PAPER – I ARTIFICIAL INTELLIGENCE | | Semester | V | |
|---|---|---|---|---|---|
| Subject Code | **21UISE01** | | Specialization | NA | |
| Type | Elective : Theory | | L:T:P:C | 71:5:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| I | Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search. | | | **K1** | **15** |
| II | Heuristic Search techniques: Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis. | | | **K1,K2** | **15** |
| III | Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem. | | | **K3** | **15** |
| IV | Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction. | | | **K4** | **15** |
| V | Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems-Definition- Characteristics- architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools. | | | **K5** | **11** |
| | **Learning Resources** | | | | |
| Text Books | Elaine Rich and Kevin Knight, Shiva Shankar Nair, ―*Artificial Intelligence*‖, McGraw-Hill Companies, 3rd edition. | | | | |
| Reference Books | 1. Stuart Russell & Peter Norvig , ―*Artificial Intelligence A Modern Approach*‖, Perason, 2nd Edition. 2. George F Luger , ―*Artificial Intelligence"*, Pearson 2002, 4th Edition. 3. V S Janaki Raman, K Sarukesi, P Gopalakrishnan, ―*Foundations of Artificial Intelligent and Expert Systems*‖, MacMillan Indialimited. | | | | |
| Website / Link | NPTEL & MOOC courses titled Artificial Intelligence and ExpertSystems 1.https://nptel.ac.in/courses/106106140/ 2.https://nptel.ac.in/courses/106106126/ | | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|:---:|:---:|:---:|:---:|:---:|
| CO1 | M | S | M | L |
| CO2 | S | M | M | L |
| CO3 | S | M | M | L |
| CO4 | M | S | M | L |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

| Subject Title | SEMESTER – V PAPER – II <br><br> COMPUTER NETWORKS | Semester | V |
|---|---|---|---|
| Subject Code | 21UISE02 | Specialization | NA |
| Type | Elective : Theory | L:T:P:C | 71:5:0:4 |

**Course Objective:**

1. To understand the concept of Computer Network.
2. To impart knowledge about networking and internet devices.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the concept of networks and its types. | K1 |
| CO2 | Understanding the wireless communications. | K2 |
| CO3 | Understand and Apply data link protocols. | K3 |
| CO4 | Evaluate the network design issues. | K3,K4 |
| CO5 | Analyze the connection issues. | K5 |

| Subject Title | SEMESTER – V PAPER – II COMPUTER NETWORKS | | Semester | V | |
|---|---|---|---|---|---|
| Subject Code | **21UISE02** | | Specialization | NA | |
| Type | Elective : Theory | | L:T:P:C | 71:5:0:4 | |
| **Unit** | **Contents** | | **Levels** | **Sessions** | |
| **I** | Introduction – Network Hardware - Software - Reference Models - OSI and TCP/IP Models - Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer - Theoretical Basis for Data Communication - Guided Transmission Media. | | **K1** | **15** | |
| **II** | Wireless Transmission - Communication Satellites - Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching. Data Link Layer: Design Issues - Error Detection and Correction. | | **K2** | **15** | |
| **III** | Elementary Data Link Protocols - Sliding Window Protocols - Data Link Layer in the Internet - Medium Access Layer - Channel Allocation Problem - Multiple Access Protocols - Bluetooth. | | **K3** | **15** | |
| **IV** | Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms - IP Protocol - IP Addresses - Internet Control Protocols. | | **K3,K4** | **15** | |
| **V** | Transport Layer - Services - Connection Management - Addressing, Establishing and Releasing a Connection - Simple Transport Protocol - Internet Transport Protocols (ITP) - Network Security: Cryptography. | | **K5** | **11** | |
| | **Learning Resources** | | | | |
| **Text Books** | A. S. Tanenbaum, ―Computer Networks‖, Prentice-Hall of India 2008, 4th Edition. | | | | |
| **Reference Books** | 1. Stallings, ―Data and Computer Communications‖, Pearson Education 2012, 7th Edition. <br> 2. B. A. Forouzan, ―Data Communications and Networking‖, Tata McGraw Hill 2007, 4th Edition. <br> 3. F. Halsall, ―Data Communications, Computer Networks and Open Systems‖, Pearson Education 2008. | | | | |
| **Website / Link** | NPTEL & MOOC courses titled Computer Networks <br> https://nptel.ac.in/courses/106106091/ | | | | |

<u>**Mapping with Programme Outcomes**</u>

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | S | - |
| **CO2** | S | M | M | S |
| **CO3** | S | L | L | M |
| **CO4** | M | S | M | S |
| **CO5** | S | L | S | S |

S- Strong , M- Medium , L – Low

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| Subject Title | **SEMESTER – V PAPER – III** **MOBILE COMPUTING** | **Semester** | **V** |
|---|---|---|---|
| **Subject Code** | **21UISE03** | **Specialization** | **NA** |
| **Type** | **Elective : Theory** | **L:T:P:C** | **71:5:0:4** |

**Course Objective:**

1. To make the student understand the concepts of mobile computing.

2. To familiar with the network protocol stack.

3. To be exposed to Ad-Hoc networks.

4. Gain knowledge about different mobile platforms and application development.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basic concepts of mobile computing. | K1 |
| **CO2** | Understanding mobile IP. | K1,K2 |
| **CO3** | Apply Mobile Telecommunication system. | K3 |
| **CO4** | Evaluate mobile ad hoc system. | K4 |
| **CO5** | Implement mobile operating system. | K5 |

| Subject Title | **SEMESTER – V PAPER – III MOBILE COMPUTING** | **Semester** | **V** |
|---|---|---|---|
| **Subject Code** | **21UISE03** | **Specialization** | **NA** |
| **Type** | **Elective : Theory** | **L:T:P:C** | **71:5:0:4** |
| **Unit** | **Contents** | **Levels** | **Sessions** |
| **I** | Introduction-Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MACIssues Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes | **K1** | **15** |
| **II** | Mobile Internet Protocol and Transport Layer-Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance. | **K1,K2** | **15** |
| **III** | Mobile Telecommunication System-Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Tele communication System (UMTS). | **K3** | **15** |
| **IV** | Mobile Ad-Hoc Networks-Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks ( VANET) – MANET Vs VANET–Security. | **K4** | **15** |
| **V** | Mobile Platforms and Applications-Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – M-Commerce – Structure– Pros & Cons – Mobile Payment System – Security Issues. | **K5** | **11** |
| | **Learning Resources** | | |
| **Text Books** | Prasant Kumar Pattnaik, Rajib Mall, ‒*Fundamentals of Mobile Computing*‖, PHI Learning Pvt. Ltd, New Delhi 2012. | | |
| **Reference Books** | 1. Jochen H. Schller, ‒*Mobile Communications*‖, Pearson Education, New Delhi, 2007, 2<sup>nd</sup>Edition. 2. Dharma PrakashAgarval, Qing and An Zeng, "*Introduction to Wireless and Mobile systems*", Thomson Asia Pvt Ltd.2005. 3. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, ‒*Principles of Mobile Computing*‖, Springer 2003. | | |
| **Website / Link** | NPTEL & MOOC courses titled Mobile Computing 1.https://www.smartzworld.com/notes/mobile-computing-pdf-notes-mc-notes-pdf/ 2.https://www.vidyarthiplus.com/vp/Thread-IT6601-Mobile-Computing-Lecture-Notes-All-Uni | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|:---:|:---:|:---:|:---:|:---:|
| CO1 | M | S | M | L |
| CO2 | S | M | M | L |
| CO3 | S | M | M | L |
| CO4 | M | S | M | L |
| CO5 | S | M | L | L |

S- Strong , M- Medium , L – Low

## ELECTIVE II

| Subject Title | SEMESTER – VI PAPER - I DATA MINING AND WAREHOUSING | Semester | VI |
|---|---|---|---|
| Subject Code | 21UISE04 | Specialization | NA |
| Type | Elective : Theory | L:T:P:C | 86:6:0:4 |

**Course Objective:**

1. To introduce the basic concepts and techniques of Data Mining.
2. To study the basic concepts of cluster analysis.
3. To study a set of typical clustering methodologies, algorithms and applications.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basic concepts of data mining and data preprocessing. | K1 |
| CO2 | Understanding the data mining primitives. | K2 |
| CO3 | Apply mining association rule. | K3 |
| CO4 | Evaluate classification and Prediction. | K4 |
| CO5 | Implement cluster analysis. | K5 |

| Subject Title | SEMESTER – VI PAPER – I DATA MINING AND WAREHOUSING | Semester | VI | |
|---|---|---|---|---|
| Subject Code | **21UISE04** | Specialization | NA | |
| Type | **Elective : Theory** | **L:T:P:C** | **86:6:0:4** | |
| Unit | **Contents** | | **Levels** | **Sessions** |
| **I** | Introduction: Data mining application – data mining techniques – data mining case studies- the future of data mining – data mining software - Association rules mining: basics- task and a naïve algorithm- Apriori algorithm – improve the efficient of the Apriori algorithm – mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms. | | **K1** | **17** |
| **II** | Classification : Introduction – decision tree – over fitting and pruning - DT rules- Naive bayes method- estimation predictive accuracy of classification methods - other evaluation criteria for classification method – classification software. | | **K2** | **17** |
| **III** | Cluster analysis: cluster analysis – types of data – computing distances-types of cluster analysis methods- partitioned methods – hierarchical methods – density based methods – dealing with large databases – quality and validity of cluster analysis methods - cluster analysis software. | | **K3** | **17** |
| **IV** | Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software - Search engines: Search engines functionality- search engines architecture – ranking of web pages. | | **K4** | **17** |
| **V** | Data warehousing: Introduction – Operational data sources- data warehousing - Data warehousing design – Guidelines for data warehousing implementation - Data warehousing metadata - Online analytical processing (OLAP): Introduction – OLAP characteristics of OLAP system – Multidimensional view and data cube - Data cube implementation - Data cube operations OLAP implementation guidelines. | | **K5** | **18** |
| | **Learning Resources** | | | |
| **Text Books** | G.K. Gupta, ‒Introduction to Data mining with case studies‖, $2^{nd}$ Edition, PHI Private limited, New Delhi, 2011 | | | |
| **Reference Books** | Arun K Pujari, ‒Data Mining Techniques‖, $10^{th}$ impression, University Press, 2008. | | | |
| **Website/ Link** | NPTEL & MOOC courses titled Data Mining 1.http://nptel.iitm.ac.in/video.php?subjectId=10610609 2.http://cecs.louisville.edu/datamining/PDF/0471228524.pdf | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|-----------|-----|-----|-----|-----|
| CO1 | S | S | M | - |
| CO2 | S | L | M | S |
| CO3 | S | M | L | M |
| CO4 | M | S | - | S |
| CO5 | S | L | M | S |

S- Strong , M- Medium , L – Low

| Subject Title | SEMESTER – VI PAPER – II WIRELESS NETWORK | Semester | VI |
|---|---|---|---|
| Subject Code | 21UISE05 | Specialization | NA |
| Type | Elective : Theory | L:T:P:C | 86:6:0:4 |

**Course Objective:**

1. To understand about Wireless Networks.

2. To familiar with Protocol Stack and Standards.

3. To be exposed to 3G/4G Services.

4. Gain knowledge about Its Protocols and Applications.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basic concepts of WLAN technologies. | K1 |
| CO2 | Understanding mobile IP. | K2 |
| CO3 | Apply TCP enhancements. | K3 |
| CO4 | Evaluate UTMS. | K4 |
| CO5 | Implement 4G. | K5 |

| Subject Title | SEMESTER – VI PAPER – II WIRELESS NETWORK | | Semester | VI | |
|---|---|---|---|---|---|
| Subject Code | **21UISE05** | | Specialization | NA | |
| Type | **Elective : Theory** | | L:T:P:C | 86:6:0:4 | |
| Unit | Contents | | | Levels | Sessions |
| **I** | Introduction-WLAN Technologies: Infrared, UHF Narrowband, Spread Spectrum -IEEE802.11: System Architecture, Protocol Architecture, Physical Layer, MAC Layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 – Bluetooth: Architecture, Radio Layer, Baseband Layer, Link Manager Protocol, Security – IEEE802.16-WIMAX: Physical Layer, MAC, Spectrum Allocation for WIMAX. | | | **K1** | **18** |
| **II** | Introduction – Mobile IP: IP Packet Delivery, Agent Discovery, Tunneling And Encapsulation, IPV6-Network Layer In The Internet- Mobile IP Session Initiation Protocol – Mobile Ad-Hoc Network: Routing, Destination Sequence Distance Vector, Dynamic Source Routing. | | | **K2** | **18** |
| **III** | TCP Enhancements For Wireless Protocols – Traditional TCP: Congestion Control, Fast Retransmit/Fast Recovery, Implications Of Mobility – Classical TCP Improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time Out Freezing, Selective Retransmission, Transaction Oriented TCP – TCP Over 3G Wireless Networks. | | | **K3** | **18** |
| **IV** | Overview Of UTMS Terrestrial Radio Access Network-UMTS Core Network Architecture: 3G-MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, DNS/DHCP-High Speed Downlink Packet Access (HSDPA) - LTE Network Architecture And Protocol. | | | **K4** | **18** |
| **V** | 4GIntroduction – 4G Vision – 4G Features And Challenges – Applications Of 4G – 4G Technologies: Multicarrier Modulation, Smart Antenna Techniques, OFDM-MIMO Systems, Adaptive Modulation And Coding With Time Slot Scheduler, Cognitive Radio. | | | **K5** | **14** |
| | **Learning Resources** | | | | |
| **Text Books** | 1. Jochen Schiller, ‖Mobile Communications‖, Second Edition, Pearson Education 2012.(Unit I,II,III) 2. Vijay Garg , ‒Wireless Communications And Networking‖, First Edition, Elsevier 2007.(Unit IV,V) | | | | |
| **Reference Books** | 1. Erik Dahlman, Stefan Parkvall, Johan SkoldAnd Per Beming, ‒3G Evolution HSPA And LTE For Mobile Broadband‖, Second Edition, Academic Press, 2008. 2. Anurag Kumar, D.Manjunath, Joy Kuri, ‒Wireless Networking‖, First Edition, Elsevier 2011. 3. Simon Haykin , Michael Moher, David Koilpillai, ‒Modern Wireless Communications‖, First Edition, Pearson Education 2013 | | | | |

| Website / Link | 1.www2.scut.edu.cn<br>2.www.iqytechnicalcollege.com<br>3.www.rejinPaul.com |
|---|---|

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | M | S | S | L |
| CO2 | S | S | M | L |
| CO3 | S | M | L | L |
| CO4 | M | S | L | L |
| CO5 | S | M | M | L |

S- Strong , M- Medium , L – Low

| Subject Title | **SEMESTER – VI PAPER – III**<br>**COMPUTER GRAPHICS** | **Semester** | **VI** |
|---|---|---|---|
| **Subject Code** | **21UISE06** | **Specialization** | **NA** |
| **Type** | **Elective : Theory** | **L:T:P:C** | **86:6:0:4** |

**Course Objective:**

1. To understand about Computer Graphics.

2. To familiar with scan and I/O devices.

3. To be exposed to 2D Transformations and clipping.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basic concepts of Graphics system. | K1 |
| **CO2** | Understanding scan system and I/O Devices. | K2 |
| **CO3** | Apply 2D Transformations. | K3 |
| **CO4** | Evaluate 3D Transformations. | K4 |
| **CO5** | Implement visual surface techniques. | K5 |

| Subject Title | SEMESTER – VI PAPER – III COMPUTER GRAPHICS | Semester | VI | |
|---|---|---|---|---|
| Subject Code | **21UISE06** | Specialization | NA | |
| Type | **Elective : Theory** | L:T:P:C | 86:6:0:4 | |
| Unit | Contents | | Levels | Sessions |
| **I** | Overview of graphics Systems: Video Display Device – Refresh Cathode-Ray tubes Raster – Scan Displays Random – Scan Displays – Color CRT Monitors –Direct view Storage tubes Flat – Panel Displays Three – Dimensional Viewing Devices. Stereoscopic and Virtual – Reality Systems. | | **K1** | **18** |
| **II** | Raster – Scan Systems Video Controller – Random – Scan Systems Video Controller – Random-Scan Systems – Input device – Keyboard Mouse – Trackball and Space ball . Joysticks – Data Glove – Digitizers- Image Scanners – Touch Panels – Light pens. Voice Systems – Hard-Copy Devices – Line Drawing Algorithms DDA Algorithms – Circle generating Algorithm Properties of Ellipses | | **K2** | **18** |
| **III** | Two Dimensional Geometric Transformation: Basic Transformations - Translation – Rotation – Scaling – Matrix Representations and Homogeneous Coordinates – Other Transformations Reflections Two Dimensional Viewing : Windows to view point coordinate Transformations – Clipping Operations – Point Clipping – Line Clipping – Curve Clipping – Text Clipping – Exterior Clipping. | | **K3** | **18** |
| **IV** | Three Dimensional Concepts: Three Dimensional Display method – Parallel projection – Depth cueing - visible line and surface – Three Dimensional Geometric and modeling Transformations: Translation – Rotation - Scaling – Composite Transformations. Three Dimensional Viewing: Viewing pipeline – Viewing Coordinates – Projections – Parallel Projections – Perspective Projections. | | **K4** | **18** |
| **V** | Visible Surface Detection Methods : Classification Visible Surface Detection Algorithms – Back Face Detection – Depth – Buffer Method – A-Buffer Method – Scan line method – Depth sorting method – BSP tree method – Area Subdivision Method. | | **K5** | **14** |
| | **Learning Resources** | | | |
| **Text Books** | Donald Hearn &M.Pauline Baker , ‒Computer Graphics‖,2nd Edition, 1996 | | | |
| **Reference Books** | John f. Hughes, Andries Van Dam, Morgan Mcguire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, ‒*Computer Graphics* Principles and Practice‖ 3rd*Edition,* Pearson Education,2014. | | | |
| **Website / Link** | 1.www.javatpoint.com/computer-graphics<br>2.www.taylorfrancis.com | | | |

<u>**Mapping with Programme Outcomes**</u>

| CO Number | PO1 | PO2 | PO3 | PO4 |
|:---------:|:---:|:---:|:---:|:---:|
| CO1 | M | S | M | L |
| CO2 | S | M | M | M |
| CO3 | S | M | L | L |
| CO4 | M | S | L | M |
| CO5 | S | S | M | L |

S- Strong , M- Medium , L – Low

## ELECTIVE III

| Subject Title | **SEMESTER – VI PAPER – I**<br>**SOFTWARE TESTING** | Semester | VI |
|---|---|---|---|
| **Subject Code** | **21UISE07** | **Specialization** | **NA** |
| **Type** | **Elective : Theory** | **L:T:P:C** | **86:6:0:4** |

### Course Objective:

1. To study various Software techniques.
2. To study fundamental concepts in software testing.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basic concepts of SDLC. | K1 |
| **CO2** | Understanding Block box testing. | K2 |
| **CO3** | Apply system testing. | K3 |
| **CO4** | Evaluate performance testing. | K4 |
| **CO5** | Implement test planning. | K5 |

| Subject Title | **SEMESTER – VI PAPER – I**<br>**SOFTWARE TESTING** | | Semester | VI | |
|---|---|---|---|---|---|
| Subject Code | **21UISE07** | | Specialization | NA | |
| Type | **Elective : Theory** | | L:T:P:C | 86:6:0:4 | |
| Unit | **Contents** | | | Levels | Sessions |
| **I** | SOFTWARE DEVELOPMENT LIFE CYCLE MODELS: Phases of Software project –Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing | | | **K1** | **18** |
| **II** | BLACK-BOX TESTING: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing - Defect Bash | | | **K2** | **18** |
| **III** | SYSTEM AND ACCEPTANCE TESTING: System Testing Overview – Why is System testing done? – Functional versus Non-functional Testing - Functional System Testing - Non-Functional Testing-Acceptance Testing - Summary of Testing Phases | | | **K3** | **18** |
| **IV** | PERFORMANCE TESTING: Factors Governing Performance Testing – Methodology for Performance Testing - Tools for Performance Testing - Process for Performance Testing - Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing? – How to do Regression Testing? – Best Practices in Regression Testing | | | **K4** | **18** |
| **V** | TEST PLANNING, MANAGEMENT, EXECUTION AND REPORTING: Test Planning – Test Management-Test Process – Test Reporting. Quick Test Professional (QTP): Overview of QTP – Testing an Application using QTP – Creating Check Points – Testing Database Application – Testing a Web Application | | | **K5** | **14** |
| | **Learning Resources** | | | | |
| **Text Books** | Srinivasan Desikan, Gopalaswamy RameshSoftware Testing Principles and Practices, Pearson Education 2012 | | | | |
| **Reference Books** | 1. Dr.K.V.K.K.Prasad ,Software Testing Tools ,Dreamtech Press2012<br>2. RenuRajani, Testing Practitioner ,HandbookPackt Publishing Limited2017<br>3. NareshChauhan ,Software Testing, Oxford University Press2nd edition, 2016 | | | | |
| **Website / Link** | https://s3_ap_southeast-1,amazonaws.com/tv-prod/documents%2F7619-2.software+system+principles+and+practices_srinivasan+desikan_gopalaswamy+ramesh.pdf | | | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|-----------|-----|-----|-----|-----|
| CO1 | S | M | L | L |
| CO2 | S | M | L | M |
| CO3 | S | M | L | L |
| CO4 | L | S | M | M |
| CO5 | S | M | M | L |

S- Strong , M- Medium , L – Low

| Subject Title | SEMESTER – VI PAPER – II NETWORK SECURITY | Semester | VI |
|---|---|---|---|
| Subject Code | 21UISE08 | Specialization | NA |
| Type | Elective : Theory | L:T:P:C | 86:6:0:4 |

**Course Objective:**

1. To Understand OSI security architecture.

2. To acquire fundamental knowledge of finite fields and number theory.
3. To Understand various block cipher and stream cipher models.
4. Study the principles of symmetric & public key crypto systems.
5. To learn the system security practices.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the OSI Security Architecture. | K1 |
| CO2 | Understanding Number theory and finite fields. | K2 |
| CO3 | Apply Block Ciphers and Data Encryption Std. | K3 |
| CO4 | Evaluate Public Key Cryptography and RSA. | K4 |
| CO5 | Implement Hash functions. | K5 |

| Subject Title | SEMESTER – VI PAPER – II NETWORK SECURITY | | Semester | VI | |
|---|---|---|---|---|---|
| Subject Code | **21UISE08** | | Specialization | NA | |
| Type | **Elective : Theory** | | L:T:P:C | 86:6:0:4 | |
| Unit | **Contents** | | | Levels | Sessions |
| **I** | OSI Security Architecture – Security attacks, services and mechanisms – Network security Model – Classical encryption techniques: Symmetric cipher model, Substitution techniques – Transposition techniques – Rotor machines – Steganography | | | **K1** | **18** |
| **II** | Number theory and finite fields: The Euclidean algorithm – Modular arithmetic - Groups, Rings and Fields – Finite fields of the Form GF (p) – Polynomial arithmetic – prime numbers – Fermat's and eulers theorems | | | **K2** | **18** |
| **III** | Block Ciphers and Data Encryption Standard: Traditional block cipher structure – Data Encryption – Strengths of DES – Block Cipher Design Principles – Advanced Encryption Standard – AES structure – AES transformation functions – AES Key expansion –implementation | | | **K3** | **18** |
| **IV** | Public Key Cryptography and RSA – Principles of Public-key Crypto systems – RSA algorithm - Diffie – Hellman Key exchange - Elgamal Cryptographic System | | | **K4** | **18** |
| **V** | Hash functions – Applications – two simple hash functions – Hash functions based on Cipher block chaining - Secure Hash Algorithm (SHA) | | | **K5** | **14** |
| | **Learning Resources** | | | | |
| **Text Books** | William Stallings, ―*Cryptography and Network Security: Principles and Practice*‖, Pearson Education 2013,6[th] Edition. | | | | |
| **Reference Books** | 1. Behrouz A. Ferouzan, ―*Cryptography & Network Security*‖, Tata McGraw Hill2007. 2. Man Young Rhee, ―*Internet Security: Cryptographic Principles, Algorithms and Protocols*‖, Wiley Publications2003. 3. Charles Pfleeger, ―*Security in Computing*‖, Prentice Hall of India 2006, 4[th]Edition. 4. Ulysess Black, ―*Internet Security Protocols",* Pearson Education Asia2000. 5. Charlie Kaufman and Radia Perlman, Mike Speciner, ―*Network Security, Private Communication in Public World*‖, PHI 2002, 2nd Edition. | | | | |
| **Website /Link** | NPTEL & MOOC courses titled NetworkSecurity https://nptel.ac.in/courses/106105031/ | | | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|:---:|:---:|:---:|:---:|:---:|
| CO1 | S | M | M | L |
| CO2 | S | M | L | L |
| CO3 | S | M | L | L |
| CO4 | M | L | S | M |
| CO5 | S | M | M | L |

S-  Strong , M- Medium , L – Low

| Subject Title | **SEMESTER – VI PAPER – III**<br>**INTERNET OF THINGS** | **Semester** | VI |
|---|---|---|---|
| **Subject Code** | **21UISE09** | **Specialization** | **NA** |
| **Type** | **Elective : Theory** | **L:T:P:C** | **86:6:0:4** |

**Course Objective:**

1. Use of Devices, Gateways and Data Management in IoT.
2. Design IoT applications in different domain and be able to analyze their performance
3. Implement basic IoT applications on embedded platform**.**

| CO<br>Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember IoT and Web technology. | K1 |
| **CO2** | Understanding M2M to IoT. | K2 |
| **CO3** | Apply IoT Architecture. | K3 |
| **CO4** | Evaluate IoT Applications. | K4 |
| **CO5** | Implement IoT Privacy, Security and Governance. | K5 |

| Subject Title | SEMESTER – VI PAPER – III INTERNET OF THINGS | Semester | VI | |
|---|---|---|---|---|
| Subject Code | **21UISE09** | Specialization | NA | |
| Type | **Elective : Theory** | L:T:P:C | 86:6:0:4 | |
| **Unit** | **Contents** | **Levels** | **Sessions** | |
| **I** | IoT& Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics. | **K1** | **18** | |
| **II** | M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. | **K2** | **18** | |
| **III** | IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views | **K3** | **18** | |
| **IV** | IoT Architecture Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, e-Health. | **K4** | **18** | |
| **V** | Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security | **K5** | **14** | |
| | **Learning Resources** | | | |
| **Text Books** | Vijay Madisetti and ArshdeepBahga, ―*Internet of Things: (A Hands-on Approach)*‖, Universities Press (INDIA) Private Limited 2014, 1ˢᵗ Edition. | | | |
| **Reference Books** | 1. Michael Miller, ―*The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World*‖, Pearson Education2015.<br>2. Francis da Costa, ―*Rethinking the Internet of Things: A Scalable Approach to* | | | |

| | |
|---|---|
| | *Connecting Everything*‖, Apress Publications 2013, 1ˢᵗEdition.<br>**3.** WaltenegusDargie, Christian Poellabauer, "*Fundamentals of Wireless Sensor Networks: Theory and Practice*‖, Wiley 2014**.**<br>4. CunoPfister, ‒*Getting Started with the Internet of Things*‖, O"Reilly Media2011. |
| **Website /Link** | 1.https://github.com/connectIOT/iottoolkit<br>2.https://www.arduino.cc/<br>3.http://www.zettajs.org/ |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | M | M | L |
| **CO2** | S | M | M | L |
| **CO3** | S | M | M | M |
| **CO4** | M | L | S | M |
| **CO5** | S | L | M | L |

S-  Strong , M- Medium , L – Low

## NON MAJOR ELECTIVE COURSE (NMEC) - I

| Subject Title | **SEMESTER – III PAPER – I**<br>**BASICS OF COMPUTERS** | **Semester** | **III** |
|---|---|---|---|
| **Subject Code** | **21UISN01** | **Specialization** | **NA** |
| **Type** | **NMEC: Theory** | **L:T:P:C** | **26:2:0:2** |

**Course Objective:**

1. To Understand the basics of computers.
2. To prepare the students for analyze data processing.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basics of computers. | K1 |
| **CO2** | Understand number system. | K2 |
| **CO3** | Demonstrate the functions of computer system. | k3 |
| **CO4** | Study the input and output system. | K4 |
| **CO5** | Analyze data processing. | K5 |

| Subject Title | **SEMESTER – III PAPER – I BASICS OF COMPUTERS** | | Semester | III |
|---|---|---|---|---|
| Subject Code | **21UISN01** | | Specialization | NA |
| Type | **NMEC: Theory** | | L:T:P:C | 26:2:0:2 |
| **Unit** | **Contents** | | **Levels** | **Sessions** |
| **I** | Introduction to Computer: Introduction – Types of computers – Characteristics of Computers. Generations of Computers: First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation. Classification of Digital Computers: Introduction – Microcomputers – Personal Computer – Portable Computers – Mini Computers – Super Computers – Main Frames. | | **K1** | **5** |
| **II** | Number System: Introduction – Decimal Number System – Binary Number System – Binary-Decimal Conversion – Decimal Binary Conversion – Binary Addition – Binary Subtraction – Complements – 9's Complement – 10's Complement – 1's Complements – 2's Complements – BCD - Bits, Bytes, Words – Octal – Hexadecimal Number System. | | **K2** | **5** |
| **III** | Anatomy of Digital Computer : Functions and Components of Computer – Central Processing Unit – Control Unit – Arithmetic – Logic Unit – Memory – Registers – Addresses. Memory Units: RAM, ROM, PROM, EPROM, EEPROM, And Flash Memory | | **K3** | **5** |
| **IV** | Input Devices: Introduction – Keyboard – Mouse – Types of Mice – Connections – Mouse pad – Trackball – joystick – Digitizing Tablet – Scanners – Digital Camera – MICR – OCR – OMR – Bar Code Reader – Speech Input Device- Touch Screen – Touch Pad – Light Pen. Output Devices: Introduction – Monitor – Classification of Monitors – Monochrome – Gray Scale – Color – Digital Monitor – Analog Monitor – Characteristics of monitor – Printers. | | **K4** | **5** |
| **V** | Computer Software: Introduction – Operating System – Utilities – Compiler and Interpreters – Word Processor – Spreadsheets – Presentation Graphics – DBMS – Programming Languages: Machine Language – Assembly Language – High level language – Types of High Level Language. Data Processing: Data VS Information – File Processing – Sequential File Processing – Direct Access file Processing. | | **K5** | **6** |
| | **Learning Resources** | | | |
| **Text Books** | Alexis Leon and Mathews Leon, ―Fundamentals of Computer Science and Communication Engineering‖, Leon Tech world, 1998. | | | |
| **Reference Books** | 1. B Ram and Sanjay Kumar, ―Computer Fundamentals‖, 5th Edition, New Age International Publishers, 2014. 2. Pradeep K Sinha, PritiSinha, ―Computer Fundamentals‖, BPB Publications, 2004. 3. Anita Goel, ―Computer Fundamentals‖, 1st Edition, Pearson Education India, 2010. | | | |

| Website/ Link | https://www.gopeaople.edu/blog/the_basics_of_computer_science_how_to_get_started/ www.tutorialspoint.com>basics_of_computer |
|---|---|

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | M | M | --- |
| CO2 | M | M | - | S |
| CO3 | S | M | L | M |
| CO4 | M | S | M | - |
| CO5 | S | M | - | L |

S- Strong , M- Medium , L – Low

## NON MAJOR ELECTIVE COURSE (NMEC) - I

| Subject Title | SEMESTER – III PAPER – II COMPUTER APPLICATIONS FOR AUTOMATION | Semester | III |
|---|---|---|---|
| Subject Code | 21UISN02 | Specialization | NA |
| Type | NMEC: Theory | L:T:P:C | 26:2:0:2 |

**Course Objective:**
1. To acquire knowledge on editor, spread sheet and slide preparation.
2. To improve creative thinking in presentation software.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of computers. | K1 |
| CO2 | Understand MS word. | K2 |
| CO3 | Demonstrate the functions of MS excel. | k3 |
| CO4 | Study the basics of MS power point. | K4 |
| CO5 | Analyze data processing with MS Access. | K5 |

| Subject Title | **SEMESTER – III PAPER – II COMPUTER APPLICATIONS FOR AUTOMATION** | **Semester** | **III** | |
|---|---|---|---|---|
| Subject Code | **21UISN02** | **Specialization** | **NA** | |
| Type | **NMEC: Theory** | **L:T:P:C** | **26:2:0:2** | |
| **Unit** | **Contents** | | **Levels** | **Sessions** |
| **I** | Introduction to Computers: Introduction- Importance- History- Anatomy | | **K1** | **5** |
| **II** | MS-Word: Basics –Do's and Don'ts – Menus – Commands – Tool Bars – Icons – Word Formatting Tool Bar | | **K2** | **5** |
| **III** | MS-Excel: Basics – Do's and Don'ts – Menus – Commands – Tool Bars – Icons | | **K3** | **5** |
| **IV** | MS-PowerPoint: Basics – Menus – Tool Bars – Navigation | | **K4** | **5** |
| **V** | MS-Access: Introduction – Parts of an Window: - Creating a New Data Base – Table Wizard – Renaming – Saving the Database – Relationships – Query – Form – Reports – Exiting MS-Access | | **K5** | **6** |
| | **Learning Resources** | | | |
| **Text Books** | Sanjay Saxena, ‒MS-Office 2000 for everyone‖, Vikas Publishing House Pvt. Ltd, Reprint 2006 | | | |
| **Reference Books** | 1. NellaiKannan, ‒MS-Office‖, Nels Publications, 3rd Edition, 2004.  2. John Walkenbach, Herb Tyson, Michael R.Groh, FaitheWempen and Lisa  A.Bucki , ‒ Microsoft Office 2010 Bible ‒, Wiley India Pvt. Ltd , Reprint  2010 | | | |
| **Website/ Link** | 1. https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepag es/9780735623026.pdf  2. https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core. pdf  3. https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepag es/9780735697799.pdf | | | |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | M | M | --- |
| **CO2** | S | M | - | - |
| **CO3** | S | S | L | M |
| **CO4** | M | S | M | - |
| **CO5** | S | M | M- | L |

S- Strong , M- Medium , L – Low

# NON MAJOR ELECTIVE COURSE (NMEC) – II

| Subject Title | **SEMESTER – IV PAPER – I**<br>**BASICS OF INTERNET** | **Semester** | **IV** |
|---|---|---|---|
| **Subject Code** | **21UISN03** | **Specialization** | **NA** |
| **Type** | **NMEC: Theory** | **L:T:P:C** | **26:2:0:2** |

**Course Objective:**
1. To improve the skills of surfing internet.
2. To prepare the students for developing webpage using HTML.

| CO<br>Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basics of Internet. | K1 |
| **CO2** | Understand internet technologies. | K2 |
| **CO3** | Demonstrate tags in HTML. | K3 |
| **CO4** | Study the basics of create list and tables. | K4 |
| **CO5** | Analyze frames and forms. | K5 |

| Subject Title | SEMESTER – IV PAPER – I BASICS OF INTERNET | | Semester | IV |
|---|---|---|---|---|
| Subject Code | **21UISN03** | | **Specialization** | NA |
| Type | **NMEC: Theory** | **L:T:P:C** | 26:2:0:2 | |
| **Unit** | **Contents** | | **Levels** | **Sessions** |
| I | Introduction To The Internet: Computer in Business – Networking – Internet -E-mail – Resource Sharing – Gopher – World Wide Web – Telnet – Bulletin Board Service – Wide Area Information Service. | | **K1** | **5** |
| II | Internet Technologies: Modem - Internet addressing – Physical connections – Telephone Lines – Internet browsers – Internet Explorer – Netscape Navigator. | | **K2** | **5** |
| III | Introduction to HTML: Designing a home page – HTML documents – Anchor tag – Hyper Links. Traditional text and formatting | | **K3** | **5** |
| IV | Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR- Using Images – Creating Hyperlinks ,Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cell padding | | **K4** | **5** |
| V | Frames: Frameset – Targeted Links – No frame – Forms : Input, Textarea, Select, Option. | | **K5** | **6** |
| | **Learning Resources** | | | |
| **Text Books** | 1. C Xavier, ―World Wide Web with HTML‖, Tata McGraw Hill Education, 2000. <br> 2. H.M.Deital, P.J. Deital,―Internet and World Wide Web – How to Program‖, 4th Edition ―PHI Learning. | | | |
| **Reference Books** | Laura Lemay, ―*HTML Complete Reference, Teach Yourself Web Publishing with HTML"*. | | | |
| **Website/ Link** | 1.NPTEL & MOOC courses titled HTML. <br> 2.https://www.codecademy.com/learn/learn-html/ | | | |

### Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | M | --- |
| **CO2** | S | M | - | - |
| **CO3** | S | S | M | L |
| **CO4** | M | S | L | - |
| **CO5** | S | L | M- | L |

S- Strong , M- Medium , L – Low

## NON MAJOR ELECTIVE COURSE (NMEC) – II

| Subject Title | SEMESTER – IV PAPER – II IMAGE EDITING TOOL | Semester | IV |
|---|---|---|---|
| Subject Code | 21UISN04 | Specialization | NA |
| Type | NMEC: Theory | L:T:P:C | 26:2:0:2 |

**Course Objective:**
1. To impart Practical Training in PHOTO SHOP image editing Tool.
2. Familiarize the different text and filter effects.
3. Build programs using stamp tools.
4. Provide  knowledge on working with several layouts.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of Photoshop. | K1 |
| CO2 | Understand the working with images. | K2 |
| CO3 | Demonstrate the layering in Photoshop. | k3 |
| CO4 | Implement the layer style. | K4 |
| CO5 | Analyze the action concept. | K5 |

| Subject Title | **SEMESTER – IV PAPER – II IMAGE EDITING TOOL** | | **Semester** | **IV** | |
|---|---|---|---|---|---|
| **Subject Code** | **21UISN04** | | **Specialization** | **NA** | |
| **Type** | **NMEC: Theory** | | **L:T:P:C** | **26:2:0:2** | |
| **Unit** | **Contents** | | | **Levels** | **Sessions** |
| **I** | Getting Started with Photoshop CS5: Launching Photoshop CS5 - Exploring the Interface - Using Screen Modes - Opening an Existing Image - Opening an Image Using Adobe Bridge - Exploring Commonly Used Tools in the Tools Panel - Creating a New Document - Saving a Document - Reverting a Document - Selecting a Workspace - Creating a New Workspace - Deleting a Workspace - Working with Panels in Photoshop CS5 - Keyboard Shortcuts and Menu Settings - Customizing Preferences. | | | **K1** | **5** |
| **II** | Working with Images: Differences between Bitmap and Vector Images - Understanding Image Resolution Editing Images - Different Color Modes in Photoshop CS5 - Making Color Adjustments - File Formats in Photoshop CS5 -Creating a PDF File in Photoshop CS5 - Importing a PDF File into Photoshop CS5 - Making a Selection with Selections Tools - Modifying a Selection-Transforming a Selection - Transforming Pixels. | | | **K2** | **5** |
| **III** | Mastering Layers in Photoshop CS5:Exploring LAYERS Panel - Working with Layers -Organizing Layers Working with Opacity and Blend Modes - Working with Adjustment Layers - Masking in Photoshop CS5 - Setting the Current Foreground and Background Colors - Filling a Selection with the Current Foreground Color - Using the Content-Aware Feature - Exploring Drawing Tools - Exploring Painting Tools - Exploring Retouching Tools. | | | **K3** | **5** |
| **IV** | Working with Layer Styles and Filter Effects: Understand in Layer Styles - Working with Smart Objects - Understanding Filters. | | | **K4** | **5** |
| **V** | Animation, 3D, and Printing in Photoshop CS5:Working with Actions - Working with Automate Commands - Exploring 3D in Photoshop - Working with Animation in Photoshop CS5 - Printing in Photoshop CS5. | | | **K5** | **6** |
| | **Learning Resources** | | | | |
| **Text Books** | C Kogent Learning Solutions Inc,‒Photoshop CS5 in Simple Steps‖, Dreamtech Press, New Delhi, 2012. | | | | |
| **Reference Books** | 1. Brie Gyncild, ‒Ado be Photoshop CS6 Classroom in a Book‖, Adobe Press/Peachpit, 2012<br><br>2. Lisa DanaeDayley, Brad Dayley, ‒Adobe Photoshop Cs6 Bible‖, Wiley India Pvt Ltd.<br><br>3. Edward Bailey, ‒Photoshop: 7 Ways to Use Adobe Photoshop Like a Pro‖, Create space Independent Publishing Platform | | | | |
| **Website/ Link** | 1.www.online_image_editor.com<br>2.www.cs5_on_demand_sampler.pdf | | | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|-----------|-----|-----|-----|-----|
| CO1 | S | M | L | --- |
| CO2 | S | M | - | L |
| CO3 | S | M | L | L |
| CO4 | M | S | L | L |
| CO5 | S | L | - | M |

S- Strong , M- Medium , L – Low

## ALLIED OPTION I

| Subject Title | **SEMESTER I/III PAPER – I FUNDAMENTALS OF COMPUTERS** | Semester | I/III |
|---|---|---|---|
| **Subject Code** | **21UISA01** | **Specialization** | **NA** |
| **Type** | **Allied: Theory** | **L:T:P:C** | **86:6:0:4** |

**Course Objective:**

1. To understand the basics of computers.
2. To prepare the students for the analyze of data processing.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| **CO1** | Remember the basics of computers. | K1 |
| **CO2** | Understand the number system. | K2 |
| **CO3** | Demonstrate the functions of computer system. | K3 |
| **CO4** | Study the input and output system. | K4 |
| **CO5** | Analyze the data processing. | K5 |

| Subject Title | **SEMESTER I/III PAPER – I FUNDAMENTALS OF COMPUTERS** | **Semester** | **I/III** |
|---|---|---|---|
| Subject Code | **21UISA01** | **Specialization** | **NA** |
| Type | **Allied: Theory** | **L:T:P:C** | **86:6:0:4** |
| **Unit** | **Contents** | **Levels** | **Sessions** |
| I | Introduction to Computer: Introduction – Types of computers – Characteristics of Computers.<br><br>Generations of Computers: First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation. Classification of Digital Computers: Introduction – Microcomputers – Personal Computer – Portable Computers – Mini Computers – Super Computers – Main Frames. | **K1** | **17** |
| II | Number System: Introduction – Decimal Number System – Binary Number System – Binary-Decimal Conversion – Decimal Binary Conversion – Binary Addition – Binary Subtraction – Complements – 9's Complement – 10's Complement – 1's Complements – 2's Complements – BCD - Bits, Bytes, Words – Octal – Hexadecimal Number System. | **K2** | **17** |
| III | Anatomy of Digital Computer : Functions and Components of Computer – Central Processing Unit – Control Unit – Arithmetic – Logic Unit – Memory – Registers – Addresses. Memory Units: RAM, ROM, PROM, EPROM, EEPROM, And Flash Memory. | **K3** | **17** |
| IV | Input Devices: Introduction – Keyboard – Mouse – Types of Mice – Connections – Mouse pad – Trackball – joystick – Digitizing Tablet – Scanners – Digital Camera – MICR – OCR – OMR – Bar Code Reader – Speech Input Device- Touch Screen – Touch Pad – Light Pen. Output Devices: Introduction – Monitor – Classification of Monitors – Monochrome – Gray Scale – Color – Digital Monitor – Analog Monitor – Characteristics of monitor – Printers. | **K4** | **17** |
| V | Computer Software: Introduction – Operating System – Utilities – Compiler and Interpreters – Word Processor – Spreadsheets – Presentation Graphics – DBMS – Programming Languages: Machine Language – Assembly Language – High level language – Types of High Level Language. Data Processing: Data VS Information – File Processing – Sequential File Processing – Direct Access file Processing. | **K5** | **18** |
| | **Learning Resources** | | |
| **Text Books** | Alexis Leon and Mathews Leon, ―Fundamentals of Computer Science and Communication Engineering‖, Leon Techworld, 1998. | | |
| **Reference Books** | 1. B Ram and Sanjay Kumar, ―Computer Fundamentals‖, 5<sup>th</sup> Edition, New Age International Publishers, 2014.<br><br>2. Pradeep K Sinha, PritiSinha, ―Computer Fundamentals‖, BPB Publications, 2004.<br><br>Anita Goel, ―Computer Fundamentals‖, 1<sup>st</sup> Edition, Pearson Education India, 2010\ | | |

| Website/ Link | 1.https://www.gopeople.edu/blog/the_basics_of_computer_science_how_to_get_started 2.www.tutorialspoint.com>basics_of_computer |
|---|---|

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | M | M | --- |
| CO2 | M | M | - | S |
| CO3 | S | M | L | M |
| CO4 | M | S | M | - |
| CO5 | S | M | - | L |

S- Strong , M- Medium , L – Low

| Subject Title | COMPUTER APPLICATIONS IN OFFICE | Semester | II/IV |
|---|---|---|---|
| Subject Code | 21UISA02 | Specialization | NA |
| Type | Allied: Theory | L:T:P:C | 56:4:0:4 |

**Course Objective:**

1. To improve the quality of students in office automation process.
2. To prepare the students for various ability to prepare reports and presentations.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of MS word | K1 |
| CO2 | Understand MS word | K2 |
| CO3 | Demonstrate the functions of MS excel | k3 |
| CO4 | Study the basics of MS excel workbooks | K4 |
| CO5 | Analyze of data processing with MS power point | K5 |

| Subject Title | COMPUTER APPLICATIONS IN OFFICE | Semester | II/IV | |
|---|---|---|---|---|
| Subject Code | 21UISA02 | Specialization | NA | |
| Type | Allied: Theory | L:T:P:C | 56:4:0:4 | |
| Unit | Contents | | Levels | Sessions |
| I | MS Word Exploring Word 2007: Working in the Word Environment – Opening, Moving Around in, and closing Document – Creating and Saving A Document – Previewing and Printing Document – Editing and Proofreading Documents: Making Changes to document – Inserting Saved Text – Finding the Most Appropriate Word – Reorganizing a Document Outline – Finding and Replacing Text – Correcting spelling and Grammatical errors – Finalizing Document | | K1 | 12 |
| II | MS Word Changing the Look of Text: Quickly Formatting Text and Paragraphs – Manually changing the look of characters – Manually changing the look of paragraphs – Creating and modifying Lists-Presenting Information in Columns and Tables : Presenting Information in Columns – Creating Tabular List – Presenting Information in a Table – Formatting Table Information – Performing Calculations in a Table- Using a Table to control Page Layout. | | K2 | 12 |
| III | MS Excel Setting Up a Workbook : Creating Workbooks – Modifying Workbooks - Modifying Worksheets – Working with Data and Data Tables : Entering and Revising Data – Moving Data within a Workbook- Finding and Replacing Data – Correcting and Expanding Upon Worksheet Data – Defining a Table – Performing Calculations on Data : Naming Groups of Data – Creating Formulas to Calculate Values – Summarizing Data that meets Specific Conditions –Finding and Correcting Errors in Calculations- Changing Document Appearance. | | K3 | 12 |
| IV | MS-Access: Introduction – Parts of an Window: - Creating a New Data Base – Table Wizard – Renaming – Saving the Database – Relationships – Query – Form – Reports – Exiting MS-Access | | K4 | 10 |
| V | MS PowerPoint Starting a New Presentation – Working with Slide Text : Entering Text – Editing Text – Adding and Manipulating Text Boxes –Correcting and Sizing text – Checking Spelling – Finding and replacing text and fonts – Changing the size, Alignment, Spacing – Adjusting the Slide Layout, Order and Look : Changing the Layout of a slide – Rearranging Slides in a Presentation – Applying a theme -Switching to a Different Color Scheme – Adding Shading and texture to the background of a slide – Delivering a Presentation Electronically. | | K5 | 10 |
| | **Learning Resources** | | | |
| Text Books | 1. Step by Step 2007 Microsoft Office System -Joyce Cox and Team ,PHI learning Private ltd,Newdelhi 2009 <br> 2. Sanjay Saxena, ‒MS-Office 2000 for everyone‖, Vikas Publishing House Pvt. Ltd, Reprint 2006 | | | |

| Reference Books | 1. NellaiKannan, ‒MS-Office‖, Nels Publications, 3<sup>rd</sup> Edition, 2004. |
|---|---|
| | 2. John Walkenbach, Herb Tyson, Michael R.Groh, FaitheWempen and Lisa A.Bucki , ‒ Microsoft Office 2010 Bible ‒, Wiley India Pvt. Ltd , Reprint 2010 |
| **Website/ Link** | 1.https://ptgmedia.pearsoncmg.com/images/9780735623026/samplepag es/9780735623026.pdf <br> 2.https://www.dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core. pdf <br> 3.https://ptgmedia.pearsoncmg.com/images/9780735697799/samplepag es/9780735697799.pdf  2010 |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | M | M | M |
| **CO2** | S | M | L | M |
| **CO3** | S | S | L | M |
| **CO4** | M | S | L | M |
| **CO5** | S | M | M- | L |

S-  Strong , M- Medium , L – Low

| Subject Title | **OFFICE AUTOMATION LAB** | **Semester** | **II/IV** |
|---|---|---|---|
| Subject Code | **21UISAP01** | **Specialization** | **NA** |
| Type | **Allied: Practical** | **L:T:P:C** | **30:0:2:2** |

### Course Objective

1. To enable the students to design and develop the Office applications.
2. To qualify the students working in editor, spread sheet and slide preparation.
3. To improve creative thinking in presentation software.

## LIST OF PROGRAMS

### I. MS-WORD

1. Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text.
2. Bio data: Prepare a Bio-data.
3. Find and Replace: Write a paragraph about yourself and do the following. Find and Replace - Use Numbering Bullets, Footer and Headers.
4. Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.
5. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare at least five letters.

### II. MS-EXCEL

1. Data sorting-Ascending and Descending (both numbers and alphabets).
2. Mark list preparation for a student.
3. Individual Pay Bill preparation.
4. Invoice Report preparation.
5. Drawing Graphs. Take your own table.

### III. MS-POWERPOINT

1. Create a slide show presentation for a seminar.
2. Preparation of Organization Charts.
3. Create a slide show presentation to display percentage of marks in each semester for all students
4. Use bar chart (X-axis: Semester, Y-axis: % marks).
5. Use different presentation template different transition effect for each slide.

### Course Outcome

On successful completion of the course, the students will.
1. Understand the features in MS Word.
2. Select and apply worksheet and functions in MS EXCEL.
3. Combine multiple features in MS POWER POINT to prepare presentations.

## ALLIED OPTION II

| Subject Title | DATABASE SYSTEMS | Semester | I/III |
|---|---|---|---|
| Subject Code | 21UISA03 | Specialization | NA |
| Type | Allied: Theory | L:T:P:C | 86:6:0:4 |

**Course Objective:**
1. To improve the understanding of database theory and practices.
2. To prepare the students implement database manipulation in SQL.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of Database. | K1 |
| CO2 | Understand Database Systems Concept and Architecture. | K2 |
| CO3 | Demonstrate the functions of the Relational Data Model and SQL. | K3 |
| CO4 | Study the basics of Basics SQL. | K4 |
| CO5 | Analyze advanced SQL commands and statements. | K5 |

| Subject Title | DATABASE SYSTEMS | | Semester | I/III | |
|---|---|---|---|---|---|
| Subject Code | **21UISA03** | | Specialization | NA | |
| Type | **Allied: Theory** | | **L:T:P:C** | 86:6:0:4 | |
| Unit | **Contents** | | | Levels | Sessions |
| I | Introduction to Databases – Introduction - Characteristics of the Database Approach -Advantages of Using the DBMS Approach -A Brief History of Database Applications. | | | **K1** | **18** |
| II | Database Systems Concept and Architecture : Data Models, Schemas, and Instances - Three Schema Architecture and Data Independence - Database Languages and Interfaces- - The Database System Environment - Centralized and Client/Server Architectures for DBMSs- Classification of Database Management Systems. | | | **K2** | **18** |
| III | The Relational Data Model and SQL - Database Constraints - Relational Model Concepts- Key concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations. | | | **K3** | **18** |
| IV | Basic SQL - SQL Data Definition and Data Types - Specifying Constraints in SQL - Basic Retrieval Queries in SQL - INSERT, DELETE, and UPDATE Statements in SQL - Additional Features of SQL. | | | **K4** | **18** |
| V | More SQL: Complex Queries, Triggers, Views, and Schema Modification - More Complex SQL Retrieval Queries - Specifying Constraints as Assertions and Actions as Triggers -Views (Virtual Tables) in SQL. | | | **K5** | **14** |
| | **Learning Resources** | | | | |
| Text Books | RamezElmasri and Shamkant B. Navathe, ‒Fundamentals of database systems‖,6<sup></sup>thEdition, Addison-Wesley Publication, 2011. | | | | |
| Reference Books | Raghu Ramakrishnan, Madison,JohannesGehrke,―Database Management Systems‖, 3rdEdition,McGraw-Hill Higher Education, 2003. | | | | |
| Website/ Link | 1.www.db-book.com/db7 , 2.www.mheducation.co.in | | | | |

## Mapping with Programme Outcomes

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| **CO1** | S | S | M | M |
| **CO2** | S | M | L | S |
| **CO3** | S | M | L | M |
| **CO4** | M | S | M | M |
| **CO5** | S | M | L | L |

S-  Strong , M- Medium , L – Low

| Subject Title | E-COMMERCE TECHNIQUES | Semester | II/IV |
|---|---|---|---|
| Subject Code | 21UISA04 | Specialization | NA |
| Type | Allied: Theory | L:T:P:C | 56:4:0:4 |

**Course Objective:**
1. To improve the understanding of E-COMMERCE and E- payments.
2. To prepare the students implement HTML and E- mail creation.

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Remember the basics of E-commerce and Indian Business. | K1 |
| CO2 | Understand WWW. | K2 |
| CO3 | Demonstrate the E payment system. | K3 |
| CO4 | Study the basics Web designing. | K4 |
| CO5 | Analyze Email components. | K5 |

| Subject Title | **E-COMMERCE TECHNIQUES** | | **Semester** | **II/IV** | |
|---|---|---|---|---|---|
| Subject Code | **21UISA04** | | **Specialization** | **NA** | |
| Type | **Allied: Theory** | | **L:T:P:C** | **56:4:0:4** | |
| Unit | **Contents** | | | **Levels** | **Sessions** |
| **I** | History of E-commerce and Indian Business Context: E-Commerce –Emergence of the Internet – Emergence of the WWW – Advantages of E-Commerce – Transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporate. Business Models for E-commerce: Business Model – E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.. | | | **K1** | **12** |
| **II** | Enabling Technologies of the World Wide Web: World Wide Web – Internet Client-Server Applications – Networks and Internets – Software Agents – Internet Standards and Specifications – ISP.E-Marketing : Traditional Marketing – Identifying Web Presence Goals – Online Marketing – E-advertising – E-branding. | | | **K2** | **12** |
| **III** | E-Payment Systems: Main Concerns in Internet Banking – Digital Payment Requirements – Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet. Information systems for Mobile Commerce: Introduction – Wireless Applications – Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies. | | | **K3** | **12** |
| **IV** | HTML and Web Designing: Brief History of HTML – HTML Tags – Table Creation – Hyperlink – Reference – Headings – Alignment - Simple Web Page Creation. | | | **K4** | **10** |
| **V** | E-mail: Email – Email Components - use of Email–Email creation–browsing–search engines–downloads. | | | **K5** | **10** |
| | **Learning Resources** | | | | |
| **Text Books** | 1. P.T.Joseph, ―E-Commerce - An Indian Perspective‖, 4th Edition, PHI Learning, 2012. 2. C Xavier, ―World Wide Web Design with HTML‖, 13th Reprint, Tata McGraw Hill, 2006. 3. A.Leon and M.Leon, ―Introduction to Information Technology‖, 1stEdition, Vijay Nicole Publications, 2013. | | | | |
| **Reference Books** | 1. David Whiteley, ―E-Commerce Strategy, Technologies and Applications‖, 1st Edition, Tata Mc-Graw-Hill, 2001. 2. Kamalesh K Bajaj and Debjani Nag, ―E-Commerce – The cutting edge of Business‖, 2nd Edition, Tata McGraw-Hill Education, 2005. | | | | |

| | |
|---|---|
| | 3.  Alexis Leon and Mathews Leon, ‒Internet for Everyone‖, 15<sup>th</sup> Anniversary Edition, Leon Tech world, UBS Publications, 2012. |
| | 4.  RitendraGoel, ‒e-commerce‖, New Age International Publishers, 2016. |
| **Website/ Link** | 1.https://e_commerce_pdf_download.peatix.com/ <br> 2.www.tutorialpoints.com/html <br> 3.https://books.google.com/books/about/a//_wide_web_design_with_html.html?id=6apo xl=z4nwc |

**Mapping with Programme Outcomes**

| CO Number | PO1 | PO2 | PO3 | PO4 |
|---|---|---|---|---|
| CO1 | S | M | L | L |
| CO2 | S | M | L | L |
| CO3 | S | M | L | L |
| CO4 | M | S | M | M |
| CO5 | S | M | M | L |

S-  Strong , M- Medium , L – Low

**Note: This paper should be handled and valued by Department of Computer Science.**

| Subject Title | ALLIED PRACTICAL - II HTML PROGRAMMING | Semester | II/IV |
|---|---|---|---|
| Subject Code | **21UISAP02** | Specialization | NA |
| Type | **Allied: Practical** | **L:T:P:C** | **30:0:2:2** |

### Course Objective
1. To enable the students to design and develop the WEB PAGES.
2. To qualify the students working with tags in table.
3. To improve creative thinking in forms ,lists and frames.

### LIST OF PROGRAMS

1. Write HTML code to develop a web page that contains the different background and foreground color, with various styles.

2. Write HTML code to create a Webpage that contains an Image at its left hand side of the page when user clicks on the image; it should open another web page that displays the details of that image.

3. Create a web Page using HREF tag having the attribute ALINK, VLINK etc.

4. Create a web page, when user clicks on the link it should go to the bottom of the page.

5. Write a HTML code to create a web page of pink color and display moving message in red color.

6. Create a web page, showing an ordered list of name of your five friends and unordered list of any five your hobbies.

7. Create a HTML document containing a nested list showing the content page of any book.

8. Create a student mark list in HTML using Tables.

9. Create a HTML page to demonstrate the usage of Frames. Choose the content of the page on Your own.

10. Design an application for pay slip through HTML forms

### Course Outcome
On successful completion of the course, the students will

1. Understand the features in HTML.
2. Select and apply tags for create text, list and table.
3. Combine multiple features in forms, frames and texts.

**Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science/Information Science.**

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