# B.SC. – INFORMATION TECHNOLOGY

| SEM | COURSE CODE | PART | COURSE | COURSE TITLE | INS. HRS /WEEK | CREDIT | MARKS CIA | MARKS ESE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| I | 20U1LT1/LA1/LF1/LH1/LU1 | I | Language – I | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN1LE1 | II | English - I | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT1CC1 | III | Core – I | Programming Foundations | 5 | 5 | 25 | 75 | 100 |
| | 20UIT1CC2P | | Core – II | C Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT1AC1 | | Allied –I | Numerical Methods And Statistics | 5 | 4 | 25 | 75 | 100 |
| | 20UIT1AC2 | | Allied–II | Entrepreneurship Development | 3 | 2 | 25 | 75 | 100 |
| | 20UCN1AE1 | IV | AEC-I | Value Education | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **21** | | | **700** |
| II | 20U2LT2/LA2/LF2/LH2/LU2 | I | Language– II | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN2LE2 | II | English– II | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT2CC3 | III | Core– III | C++ Programming | 6 | 5 | 25 | 75 | 100 |
| | 20UIT2CC4P | | Core –IV | C++ Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT2AC3 | | Allied – III | Optimization Techniques | 4 | 3 | 25 | 75 | 100 |
| | 20UIT2AC4 | | Allied–IV | Digital Logics | 3 | 2 | 25 | 75 | 100 |
| | 20UCN2SE1 | IV | Skill Enhancement Course – I @ | Soft Skills Development | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **20** | | | **700** |
| III | 20U3LT3/LA3/LF3/LH3/LU3 | I | Language– III | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN3LE3 | II | English – III | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT3CC5 | III | Core– V | Data Structures | 4 | 4 | 25 | 75 | 100 |
| | 20UIT3CC6P | | Core– VI | Data Structures Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT3AC5 | | Allied– V | Java Programming | 4 | 3 | 25 | 75 | 100 |
| | 20UIT3AC6P | | Allied–VI | Java Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT3GE1 | IV | Generic Elective – I # | | 2 | 2 | - | 100 | 100 |
| | 20UCN3AE2 | | AEC-II | Environmental Studies | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **21** | | | **800** |
| IV | 20U4LT4/LA4/LF4/LH4/LU4 | I | Language–IV | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN4LE4 | II | English– IV | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT4CC7 | III | Core– VII (a) | RDBMS | 5 | 3 | 10 | 40 | 50 |
| | 20UIT4CC7 I | | Core – VII (b) | Internship | - | 2 | 10 | 40 | 50 |
| | 20UIT4CC8P | | Core - VIII | MYSQL LAB - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT4AC7 | | Allied– VII | Linux Basics | 5 | 3 | 25 | 75 | 100 |
| | 20UIT4AC8P | | Allied–VIII | Shell Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT4GE2 | IV | Generic Elective – II # | | 2 | 2 | - | 100 | 100 |
| | 20UCN4EA | V | Extension Activities | NCC, NSS, etc. | - | 1 | - | - | - |
| | | | | **TOTAL** | **30** | **21** | | | **700** |
| V | 20UIT5CC9 | III | Core – IX (a) | Web Programming | 4 | 3 | 10 | 40 | 50 |
| | 20UIT5CC9P | | Core – IX (b) | Web Programming Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT5CC10 | | Core – X | Operating System | 5 | 5 | 25 | 75 | 100 |
| | 20UIT5CC11 | | Core – XI | Python Programming | 5 | 5 | 25 | 75 | 100 |
| | 20UIT5CC12 | | Core - XII(a) | Multimedia | 3 | 3 | 10 | 40 | 50 |
| | 20UIT5CC12P | | Core - XII(b) | Python Programming Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT5DE1A/B | | DSE – I ** | | 5 | 4 | 25 | 75 | 100 |
| | 20UIT5SE2AP/BP | IV | Skill Enhancement Course – II @ | | 2 | 2 | - | 100 | 100 |
| | 20UIT5SE3AP/BP | | Skill Enhancement Course – III @ | | 2 | 2 | - | 100 | 100 |
| | 20UIT5EC1 | | Extra Credit Course – I | General Intelligence for competitive examinations | - | 4* | -- | 100* | 100* |
| | | | | **TOTAL** | **30** | **28** | | | **700** |
| VI | 20UIT6CC13 | III | Core– XIII | Computer Networks | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6CC14 | | Core–XIV | PHP Programming | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6CC15 | | Core - XV | Cyber Forensics | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6CC16P1 | | Core - XVI (A) | Document Process Tools Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT6CC16P2 | | Core - XVI (B) | PHP Programming Lab - Practical | 3 | 3 | 10 | 40 | 50 |
| | 20UIT6DE2A/B | | DSE – II ** | | 5 | 4 | 25 | 75 | 100 |
| | 20UIT6DE3AP/BP | | DSE – III ** | | 4 | 4 | 20 | 80 | 100 |
| | 20UCN6AE3 | IV | AEC-III | Gender Studies | 1 | 1 | 100 | - | 100 |
| | 20UIT6EC2 | | Extra Credit Course - II | Information Technology for competitive examinations | - | 4* | -- | 100* | 100* |
| | 20UITAECA | | Extra Credit course for All | Online Course | - | 1* | -- | - | - |
| | | | | **TOTAL** | **30** | **29** | | | **700** |
| | | | | **GRAND TOTAL** | **180** | **140** | | | **4300** |

**\* Not Considered for Grant Total and CGPA.**

# # GENERIC ELECTIVE FOR OTHER MAJOR DEPARTMENT

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| III | 20UIT3GE1 | FUNDAMENTALS OF IT |
| IV | 20UIT4GE2 | IT INRFASTRUCTURE MANAGEMENT |

## @ SKILL ENHANCEMENT COURSE

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| V | 20UIT5SE2AP | Software Testing Lab – Practical |
| | 20UIT5SE2BP | VB.Net lab – Practical |
| | 20UIT5SE3AP | Operating Systems Lab – Practical |
| | 20UIT5SE3BP | Animation Lab - Practical |

## ** DISCIPLINE SPECIFIC ELECTIVES

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| V | 20UIT5DE1A | Software Engineering |
| | 20UIT5DE1B | VB.Net |
| VI | 20UIT6DE2A | DATA MINING |
| | 20UIT6DE2B | R Programming |
| | 20UIT6DE3AP | DATAMINING USING WEKA LAB – Practical (20 + 80 = 100 Marks) |
| | 20UIT6DE3BP | R Tools Lab – Practical (20 + 80 = 100 Marks) |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| I | 20UIT1CC1 | CORE– I | PROGRAMMING FOUNDATIONS | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Use C language as the base for higher level course in programming
2. Acquire the basic constructs of C programming.
3. Apply structured approach in program design
4. Apply suitable logic in solving problems
5. Develop applications to solve real world problems

**UNIT I** 15 hours
Getting Started with C - C Instructions – Decision Control Structure: The *if* Statement – The *if-else* Statement - Use of Logical Operators - Use of Logical Operators – **# The Conditional Operators #**.

**UNIT II** 15hours
Loop Control Instruction – Loops – The *while* Loop – More Complex Repetition – The *for* Loop – The *break* Statement – The *continue* Statement – The *do-while* Loop – Case Control Instruction – Decisions with *switch* – **#The *goto* keyword#.**

**UNIT III** 15hours
Functions – Passing Values between Functions – Scope Rule of Functions – #Using Library Functions#. Pointers – Call by Value and Call by Reference – An Introduction to Pointers – Pointer Notation –The C Preprocessor – Features of C Preprocessor – Macro Expansion – File Inclusion – Conditional Compilation – #*if* and #*elif* Directives – **# Miscellaneous Directives #** – The Build Process.

**UNIT IV** 15hours
Arrays – More on Arrays – Pointers and Arrays – Multidimensional Arrays – Two-Dimensional Arrays - Arrays of Pointers –**#Three-Dimensional Array#**– Strings –Pointers and Strings – Standard Library String Functions –

**UNIT V** 15hours
Structures – Console Input / Output – Types of I/O – Console I/O Functions – File Input / Output – Data Organization – File Operations – Counting Characters, Tabs, Spaces – A File-Copy Program – File Opening Modes –**# String (Line) I/O in Files - Record I/O in Files#.**

**# ........ # Self-study portion**

**Text Book:**
YashavantKanetkar, *Let Us C*, BPB Publications, New Delhi, Fifteenth Edition, 2017.

**UNITI** : Chapters 1 2, 3 & 4
**UNITII** : Chapters 5, 6& 7
**UNITIII** : Chapters 8, 9 & 12
**UNITIV** : Chapters 13, 14&15
**UNITV** : Chapters 17, 18 & 19

**Books for References:**
1. E. Balagurusamy, *Programming in ANSI C*, Tata McGraw Hill Education Private Ltd., Fifth Edition, 2011.
2. D. Ravichandran, *Programming in C*, New Age International (P) Ltd., First Edition, 1996.

**Web Reference:**
https://www.programiz.com/c-programming

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| I | 20UIT1CC1 | PROGRAMMING FOUNDATIONS | | 5 | 5 |
| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |
| CO2 | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 40,  Relationship: High | | | | | | | | | | |

Prepared by:                                                         Checked by:

1. O.S. Abdul Qadir                                              1.K.M. Akbar Badhusha

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| I | 20UIT1CC2P | CORE – II | C PROGRAMMING LAB - Practical | 3 | 2 | 100 | 20 | 80 |

Develop a program in C

1. Using assignment statements.

2. Using different forms of If statement.

3. To demonstrate Logical operators

4. Using While, Do-While & For Loop

5. Using Switch

6. To illustrate the use of Functions & Pointers

7. Using Macro definitions to test whether a character is uppercase or lowercase

8. To make use of arrays.

9. To manipulate Strings.

10. To demonstrate structure.

11. Using console I/O Functions.

12. To copy the contents of one file into another.

Prepared by:                                                Checked by:

1. O.S. Abdul Qadir                                         1. K.M. Akbar Badhusha

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| I | 20UIT1AC1 | ALLIED – I | **NUMERICAL METHODS AND STATISTICS** | 5 | 4 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Examine methods for algebraic and transcendental equations with examples
2. Demonstrate and discuss System of Linear Equations with examples
3. Apply domain knowledge for Measures of Central Tendency and skewness.
4. Remember and illustrate the examples of Conditional Probability.
5. Classification and study of bivariate distributions with examples.

**UNIT I**                                                                                                                     **15 hours**
Solution of algebraic and transcendental equations- Bisection method- Method of Successive Approximation or the Iteration method– Newton Raphson Method (This unit contains Problems only).

**UNIT II**                                                                                                                    **15hours**
Solution of System of Linear Equations – Gauss Elimination Method, Gauss Jordan Method, Gauss Jacobi Method– Gauss Seidel Method (This unit contains Problems only).

**UNIT III**                                                                                                                  **15hours**
Measures of Central Tendency – Measures of Dispersion-Measures of skewness.(This unit contains Problems only).

**UNIT IV**                                                                                                                   **15hours**
Theory of Probability – Definitions of Probability – Sample Space – Probability of an Event – Independence of Events – Theorems on Probability – Conditional Probability – Baye's Theorem.

**UNIT V**                                                                                                                    **15hours**
Correlation (two variables only) – Karl Pearson's Correlation Coefficient and its properties. Spearman's rank correlation coefficient (repeated and non-repeated). Lines of regression – Definition – **# Properties of regression coefficients #** – Simple problems.

**# ........ # Self-study portion**

**Text Book:**

1. Dr. P.Kandasamy, Dr.K.Thilagavathy, Dr.K.Gunavathi, Numerical Methods,S. Chand, First Edition 2008.
2. S.C. Gupta, V.K. Kapoor, Fundamentals of Mathematical Statistics, Sulthan Chand & Sons, Eleventh Edition, 2002.

**UNIT I**  **:** Chapter 3 – Section 3.1, 3.2, 3.4**(T.B.1)**          **UNIT II**  : Chapter 4 - Section: 4.2, 4.8, 4.9**(T.B.1)**
**UNIT III** : Chapter 2 - Section: 2.5 to 2.9
            Chapter 3 – Section 3.3 to 3.7, 3.13 (**T.B.2**)          **UNIT IV**: Chapter 4 - Section-4.5 to 4.8 **(T.B.2)**
**UNIT V**  : Chapter 10 - Section: 10.3, 10.6, 10.7.1, 10.7.3, 10.7.4**(T.B.2)**

**Books for References:**
1. S.S. Sastry, Introductory Methods of numerical analysis, Prentice Hall of India Pvt. Ltd., 2004.
2. S.C. Gupta, V.K. Kapoor, Elements of Mathematical Statistics, Sultan Chand & Sons, 2009.

**Web Reference:**
1. https://nptel.ac.in/courses/111/107/111107105/
2. https://nptel.ac.in/courses/111/106/111106112/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| I | 20UIT1AC1 | NUMERICAL METHODS AND STATISTICS | | 5 | 4 |
| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| CO2 | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | |
| CO3 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ |
| Number of matches (✓) = 35,  Relationship: High | | | | | | | | | | |

Prepared by:                                                             Checked by:

1. Dr. V. Krishnan                                                        1. K.M. Akbar Badhusha

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| I | 20UIT1AC2 | ALLIED – II | ENTERPRENEURSHIP DEVELOPMENT | 3 | 2 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Know the parameters to assess opportunities and constraints for new business ideas.
2. Understand the systematic process to select and screen a business idea.
3. Design and evaluate strategies for successful implementation of ideas.
4. Identify the elements of success of entrepreneurial ventures and write a business plan.
5. Consider the legal and financial conditions for starting a business venture.

**UNIT I** 9 hours
**Entrepreneurship**
Introduction – Meaning and Definition of Entrepreneurship, Entrepreneur and Enterprise –Functions of Entrepreneur - Factors influencing Entrepreneurship – Qualities of an Entrepreneur – **# Types of Entrepreneur #**.

**UNIT II** 9 hours
**Small Scale Industries**
Meaning and Definition – Product Range - Capital Investment - Ownership Patterns – Meaning and importance of Tiny Industries, Ancillary Industries, Cottage Industries -Roles of SSIs-Problems of SSI's - **# Policies Governing SSI's #**.

**UNIT III** 9 hours
**Formation of Small Scale Industry**
Business opportunity - Scanning the Environment - Evaluation of alternatives and Selection based on personal competencies - Formation of a small business venture: location, clearances, permits required, formalities, licensing and registration procedures.

**UNIT IV** 9 hours
**Preparing the Business Plan (BP)**
Meaning – Importance – preparation –BP format: Financial aspects, Marketing aspects, Human Resource aspects, Technical aspects and Social aspects of the BP -**# Common pitfalls to be avoided in preparation of a BP #**.

**UNIT V** 9 hours
**Project Assistance**
Financial Assistance through SFC's, SIDBI, Commercial Banks, IFCI - Non-Financial Assistance from DIC, SISI, AWAKE, KVIC - Financial Incentives for SSI's and Tax Concessions - Assistance for obtaining Raw Material, Machinery, Land and Building and Technical Assistance - **# Industrial Estates: Role and Types #**.

**# ........ # Self-study portion**

**Text Books:**
1. Vasant Desai, *Entrepreneurship Development*, Himalaya Publishing House, 2016
2. H.R. Appannaiah,Gopala Krishna D.S, H.A Bhaskar, *Entrepreneurship Development*, Himalaya Publishing House, 2017

**Books for References:**

1. Rabindra N. Kanungo "Entrepreneurship and innovation", Sage Publications, New Delhi.
2. Tendon ,C: Environment and Entrepreneur; Cliugh Publications, Allahabad.
3. Siner A David: EntrepreneuralMegabuks; John Wiley and Sons, New York.
4. Srivastava S. B: A Practical Guide to Industrial Entrepreneurs; Sultan Chand and Sons, New Delhi.
5. Prasanna Chandra: Protect Preparation, Appraisal, Implementation; Tata McGraw Hill. New Delhi.

**Web References:**

http://ediindia.ac.in/e-policy/ [ Entepreneurial Policy India]
http://en.wikipedia.org/wiki/List_of_venture_capital_companies_in_India [Venture Capital]
indiavca.org/venture-capital-in-india.html [Venture Capital]

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | | Hours | | Credits | |
|---|---|---|---|---|---|---|---|---|
| I | 20UIT1AC2 | ENTREPRENEURSHIP DEVELOPMENT | | | 3 | | 2 | |
| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| CO2 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO4 | | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| CO5 | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Number of matches (✓) = 37,  Relationship: High | | | | | | | | | |

Prepared by:                                                       Checked by:

1.  Dr. U. Syed Aktharsha                                   1. K.M. Akbar Badhusha

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| II | 20UIT2CC3 | CORE – III | C++ PROGRAMMING | 6 | 5 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Know and apply the concepts of OOP.
2. Implement Object Oriented programming concept using basic syntaxes
3. Increases the skill of problem solving
4. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to specific problem
5. Analyse a problem and design C++ coding to solve it.

**UNIT I**                                                                                                      **18 hours**
**Object Oriented Programming concepts:** Basic concepts of OOPS-Structure of C++ Program- Tokens-Keywords-Identifiers-constants-Basic data types-User defined data types-Derived data types-Declaration of variables-Reference Variables-Manipulators- Operator in C++ - Scope Resolution Operator-Type cast Operator-Expression and its types-**#control structures#**

**UNIT II**                                                                                                     **18 hours**
**Functions:** Main Function-Call by reference-Inline function-Function overloading-Default arguments-Math Library functions-Classes and Objects:-Specifying the class –Defining Member Function –A C++ Program with class-Nesting of Member Function-Arrays within a class-Static data members and Static member functions-**#Friend Function#** - Returning Object

**UNIT III**                                                                                                    **18 hours**
**Constructor and Destructor:** Constructors-Parameterized constructor-Multiple constructor in a class-Dynamic initialization of the objects-Copy constructor-Dynamic constructor-Destructor. Operator Overloading and Type conversion: Defining operator overloading-Overloading unary operator- **#Type conversion#.**

**UNIT IV**                                                                                                     **18 hours**
**Inheritance:** Introduction-Single Inheritance-Multilevel inheritance-Multiple inheritance-Virtual base classes. Polymorphism: Pointers-Pointer to objects-this pointer-Pointer to derived classes-**#Virtual Functions#**

**UNIT V**                                                                                                      **18 hours**
**Working with Files:** Introduction-Classes for File stream- Opening and closing the file- Detecting end of file-File modes. Templates: Introduction- Class templates-Class templates with multiple parameters - Function templates

**# ........ # Self-study portion**

**Text Book:**
E.Balagurusamy, *Object Oriented Programming with C++*, [Fourth Edition], Tata McGraw Hill Publications, 2008

**UNIT I**   : 1.5, 2.6, 3.2 – 3.7, 3.10, 3.17, 3.13, 3.14, 3.18, 3.24
**UNIT II**  : 4.2, 4.4, 4.6, 4.7, 4.9, 4.11, 5.3 - 5.7, 5.9, 5.11, 5.12, 5.15 – 5.16
**UNIT III** : 6.2, 6.3 – 6.8, 7.1 – 7.3
**UNIT IV** : 8.1, 8.3, 8.5 – 8.7, 9.1 – 9.6
**UNIT V**  : 11.1 – 11.5, 12.1 – 12.4, 12.7

**Books for Reference:**
1. Herbert Schildt, *Teach yourself C++*, Third Edition, TataMcGraw Hill Publications, 2008

**Web Reference:**
http://www.cplusplus.com/doc/tutorial/
https://www.w3schools.com/cpp/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| I | 20UIT2CC3 | C++ PROGRAMMING | | 6 | 5 |
| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | |
| CO2 | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | |
| CO3 | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 37,  Relationship: High | | | | | | | | | | |

Prepared by:                                                          Checked by:

1. S. Peerbasha                                                       1. Dr. M. Sabibullah

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| II | 20UIT2CC4P | CORE – IV | **C++ PROGRAMMING LAB - Practical** | 3 | 2 | 100 | 20 | 80 |

Develop a program in C ++

1. To calculate the area and perimeter of any two basic shapes

2. Using different forms of If-Else statement

3. Using While, Do-While & For Loop

4. To illustrate Function Overloading

5. To print your personal details such as name, Roll no, Gender (M/F), Marks for five subjects, Total, Result (Pass/Reappear) by taking input from the user and display the same using two member functions

6. To illustrate Friend function

7. To illustrate class with constructors

8. To illustrate Operator Overloading

9. To implement the concept of Single level inheritance

10. To implement the concept of Multi level inheritance

11. To merge the contents of two files

12. To illustrate Function Templates


Prepared by:                                                    Checked by:

1. S. Peerbasha                                                 1. Dr. M. Sabibullah

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| II | 20UIT2AC3 | ALLIED – III | OPTIMIZATION TECHNIQUES | 4 | 3 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Demonstrate and study of operations research and illustrate the examples of mathematical formulation
2. Classification and study of Transportation problem and Assignment problems with examples
3. Analyse machine elapsed times with examples
4. Illustrate the Replacement Problems suitable examples.
5. Construct the networks and plan execution with examples.

**UNIT I**                                                        **12 hours**
Introduction to Operations Research – Mathematical Formulation of the problem – Graphical Solution Method – Simplex method – **# Big (M) Method #**.

**UNIT II**                                                    **12 hours**
Transportation problem – North West corner rule – Least cost method – Vogel's approximation Method – Assignment problems.

**UNIT III**                                                **12 hours**
Sequencing Problems: Introduction – Problem of sequencing – Basic term used in sequencing – Processing n Jobs through 2 machines – Processing n Jobs through k machines – **# Processing 2 Jobs through k machines #**.

**UNIT IV**                                               **12 hours**
Replacement Problems – Introduction – Replacement of Equipment / asset that Deteriorates Gradually – **# Replacement of Equipment that fails suddenly #**.

**UNIT V**                                                **12 hours**
Network scheduling by PERT/CPM – Introduction – Network and basic components – Rules of network construction – Critical path analysis – Probability consideration in PERT –**# Distinction between PERT and CPM #.**

**# ........ # Self-study portion**

**Text Book:**
KantiSwarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand and Sons Publishers, New Delhi, Thirteenth Edition, Reprint 2008.

**UNIT I**  **:** Chapter 2 (sections 2.1, 2.2) Chapter 3 (sections 3.1, 3.2) Chapter 4 (sections 4.1, 4.4)
**UNIT II** : Chapter 10 (sections 10.1, 10.2, 10.5, 10.8, 10.9) Chapter 11 (sections 11.1, 11.2, 11.3, 11.4)
**UNIT III** : Chapter 12 (sections 12.1 to 12.6)
**UNIT IV** : Chapter 18 (sections 18.1 to 18.3)
**UNIT V**  : Chapter 25 (sections 25.1, 25.2, and 25.4 to 25.7)

**Books for References:**
1. Sharma, S.D., "Operations Research", KedarNath Ram Nath& Co. (15th Edition), 2010.
2. Richard Bronson, Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1982.

**Web Reference:**
https://nptel.ac.in/courses/111/107/111107128/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| I | 20UIT2AC3 | OPTIMIZATION TECHNIQUES | | 4 | 3 |

| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| CO2 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| CO3 | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| CO5 | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| Number of matches (✓) = 35,  Relationship: High | | | | | | | | | | |

Prepared by:                                                          Checked by:

1. Dr. V. Krishnan                                              1. Dr. M. Sabibullah

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| II | 20UIT2AC4 | ALLIED – IV | DIGITAL LOGICS | 3 | 2 | 100 | 25 | 75 |

**Course Outcomes (CO):**

**Students will be able to**
1. Perform number conversions from one number system to another and understand the usage of various binary codes
2. Apply Boolean laws and theorems to simplify Boolean expressions
3. Implement Boolean expressions using gate networks
4. Understand the working of combinational circuits
5. Understand the working of sequential circuits

**UNIT I**                                                                                                  **9 hours**
Number Systems and Codes: Binary, Decimal, Octal and hexadecimal number systems – Conversion from one system to another – Binary Addition – Binary Subtraction – **# Sign-magnitude numbers and 2's complement representation#** - Binary Code (8421, Gray, Excess-3)

**UNIT II**                                                                                                 **9 hours**
Digital Logic: The Basic Gates - AND, OR, NOT - Universal Logic Gates – NOR, NAND.  **# Boolean Laws and Theorems #** –Simplification – Sum of Products Method – Karnaugh Simplification (upto 3 variables)

**UNIT III**                                                                                                **9 hours**
Combinational logic circuits: Multiplexers – Demultiplexers –Decoders -Encoders. Arithmetic Bulding Blocks – Half adder – Half subtractor – Full adder – Full subtractor – Adder-subtractor.

**UNIT IV**                                                                                                 **9 hours**
Sequential Logic Circuits: Flip Flops – RS Flip Flops – D Flip Flops- T Flip Flops –JK Flip-flops. Shift Registers (Serial-In-Serial-Out).

**UNIT V**                                                                                                  **9 hours**
D/A and A/D Conversion – Variable Resistor Network – Binary Ladder – D/A Converter – D/A Accuracy and Resolution – A/D Converters – **# Simultaneous Method #**.

**# ........ # Self-study portion**

**Text Book:**
Donald P Leach, Albert Paul Malvino, GoutamSaha,Digital Principles and Applications, Tata McGraw Hill Education Private Limited, New Delhi, Sixth Edition, 2002

**UNIT I**  **:** Chapter 5 & 6 (6.1, 6.2, 6.4, 6.5)
**UNIT II** : Chapter 2 & 3
**UNIT III** : Chapter 4 (4.1 - 4.3 & 4.6) & 6 (6.7 - 6.8)
**UNIT IV** : Chapter 8 & 9
**UNIT V** : Chapter 12 (12.1 – 12.5)

**Books for References:**
1. Thomas C. Bartee, Digital Computer Fundamentals, Tata McGraw Hill, 6th Edition, 25th Reprint, 2006.

**Web Reference:**
https://learn.sparkfun.com/tutorials/digital-logic/all

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| I | 20UIT2AC4 | DIGITAL LOGICS | | 3 | 2 |

| Course Outcomes (Cos) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 43,  Relationship: High | | | | | | | | | | |

Prepared by:                                                                 Checked by:

1. J. FathimaFouzia                                                      1. Dr. M. Sabibullah

Note:

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very poor | Poor | Moderate | High | Very high |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| III | 20UIT3CC5 | CORE – V | DATA STRUCTURES | 4 | 4 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Acquire knowledge in the representation of arrays and linked lists
2. Implement the application of arrays and linked lists in various structures
3. Evaluate the use of stack, queue, trees and graphs
4. Describe the concept of graphs and their applications
5. Apply the appropriate structures in problem solving

**UNIT I**                                                                                                    **12 hours**
Introduction to Data Structures: Overview – The Need for Data Structures - Definitions – Data Structures. ARRAYS: Overview – Introduction – Range of an Array – Primitive operations – Element Access in an Array – One- dimensional Array - Two-dimensional Array-Multidimensional Arrays. Linked Lists - Overview – Introduction – Memory Allocation – Benefits – Limitations – Types – Basic Operations – Singly Linked Lists – Simple Algorithms on Linked Lists - Circular Linked Lists - #Doubly Linked Lists#

**UNIT II**                                                                                                   **12 hours**
Stacks, Queues and Recursion: Introduction – Stacks – Array and Linked Representations of Stacks – Arithmetic Expressions; Polish Notation – Recursion: Towers of Hanoi – Queues: Array representation of Queues - #Linked representation of Queues# – Deques

**UNIT III**                                                                                                 **12 hours**
Trees: Introduction – Binary Trees– Representing Binary Tress in Memory – Traversing Binary Trees - Traversal Algorithms using Stacks – Header Nodes - Binary Search Trees – Searching and Inserting in Binary Search Trees – #Deleting in a Binary Search Tree# - Heap Sort

**UNIT IV**                                                                                                  **12 hours**
Graphs and their Applications: Sequential Representation of Graphs – Warshall's Algorithm – Linked Representation of a Graph – Operations on Graphs – Traversing a Graph – #Topological Sorting#

**UNIT V**                                                                                                    **12 hours**
Sorting and Searching: Introduction – Insertion Sort – Selection Sort¬ – Merging – Merge Sort – #Radix Sort# – Quick Sort - Searching and Data Modification – Hashing

**#.........# Self-study portion**

**Text Book:**
1. A. Chitra and P.T. Rajan, *Data Structures*, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2006
    **UNIT I :**Chapters 1, 3 and 4

2. Seymour Lipschutz, *Data Structures*, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2006
    **UNIT II  :** Chapter 6          **UNIT III :** Chapter7 (7.1 – 7.9)
    **UNIT IV :**Chapter 8          **UNIT V :** Chapter 9

**Books for Reference:**

Jean Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, Tata McGraw-Hill, Second Edition

**Web Reference:**
https://www.geeksforgeeks.org/data-structures/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| III | 20UIT3CC5 | DATA STRUCTURES | | 4 | 4 |
| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 40, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                    **Checked by:**

Mr. O.S. Abdul Qadir                                                Mr. M. Kamal

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| III | 20UIT3CC6P | CORE – VI | DATA STRUCTURES LAB – Practical | 3 | 2 | 100 | 20 | 80 |

Develop a program in C / C++ to

1.  Perform basic operations on arrays.

2.  Create a linked list and insert a node at specific position.

3.  Implement stack using array

4.  Implement queue using array

5.  Insert values in a binary search tree

6.  Sort a set of numbers using heap sort.

7.  Implement Warshall algorithm.

8.  Implement graph traversal (DFS & BFS) using stack and queue

9.  Implement Insertion Sort

10. Implement Selection sort

11. Implement Quick Sort

**Prepared by:**                                                    **Checked by:**

Mr. O.S. Abdul Qadir                                         Mr. M. Kamal

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| III | 20UIT3AC5 | ALLIED– V | JAVA PROGRAMMING | 4 | 3 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Understand the basic building blocks, control statements, arrays and strings in Java Programming
2. Understand the concepts of classes, objects, inheritance, polymorphism, packages and interfaces
3. Apply the exception handling mechanism in single and multithreaded programming
4. Develop the window based programs from basic level to file operations using Applet and Swing
5. Understand the usage of networking classes and access the remote objects using RMI

**UNIT I**                                                                                                          **12 hours**

Introduction to Java Programming: Introduction – Features of Java – Applications and Applets – Java Development Kit - The Building Blocks of Java – Data Types – Variable Declarations: Declaring, Initializing and Variables – Variable Types in Java- #Wrapper Classes#–Operators – Control Structures – Arrays – Strings

**UNIT II**                                                                                                         **12 hours**

Java as an OOP Language: Defining Classes – Defining Methods – Knowing *this* – Passing Arguments to Methods – Overloading Methods – Constructor Methods – Inheritance– Overriding Methods – Finalizing Classes, Methods and Variables – Abstract Classes and Methods – Packages – #Interfaces#

**UNIT III**                                                                                                        **12 hours**

Exception Handling: Basics of Exception Handling in Java – Exception Hierarchy – Throwable Class – Handling Exceptions in Java – Throwing User Defined Exceptions. Multithreading – Overview of Threads – Creating Threads – Thread Life – cycle – Thread Priorities and Thread Scheduling

**UNIT IV**                                                                                                        **12 hours**

Files and I/O Streams: Java I/O – File Streams – FileInputStream and FileOutputStream – Serialization. Applets: Applet Life Cycle – Working with applets – The HTML APPLET Tag – Basic classes in AWT - Event Handling – AWT Components - Layout Managers - # The Swing package #

**UNIT V**                                                                                                          **12 hours**

Networking and RMI: Introduction to Networking- understanding ports- Networking classes: Introduction to RMI- RMI Architecture-Implementing Remote class and Interfaces-Security

**#.........# Self-Study portion**

**Text Book:**
P. Radha Krishna, *Object Oriented Programming through JAVA*, Universities Press, 2007
**UNIT I**   - Chapter 2 (2.1-2.5) & Chapter 3 (3.1-3.8)
**UNIT II**  - Chapter 4
**UNIT III** - Chapter 5 (5.2-5.6) & Chapter 6 (6.1-6.4)
**UNIT IV** - Chapter 7 (7.1-7.4), Chapter 8(8.3-8.5), Chapter 10 (10.2,10.5,10.6,10.7) & Chapter 11 (11.2)
**UNIT V  -** Chapter 13

**Books for Reference:**
1. Herbert Schildt , *JAVA-The Complete Reference*, TATA McGraw Hill Edition, 2011.
2. C. Muthu,  *Programming with Java*, Second Edition, Vijay Nicole imprints Pvt. Ltd, 2008.

**Web Reference:**
https://www.programiz.com/java-programming

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| III | 20UIT3AC5 | JAVA PROGRAMMING | | 4 | 3 |

| Course Outcomes COs | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 43, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                 **Checked by:**

Dr. S. Abdul Saleem                                                               Mr. M. Kamal

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| III | 20UIT3AC6P | ALLIED– VI | JAVA PROGRAMMING LAB - Practical | 3 | 2 | 100 | 20 | 80 |

1. Simple Programs using Control Statements
    a) Finding Biggest among three Numbers(If statements)
    b) Displaying sum of the individual digits of a given number (while/do..while loop)
    c) Finding Factorial of a given number (for loop)
    d) Displaying the day of a week (switch statement)

2. Program to demonstrate arrays and strings
    a) Sorting a set of given numbers (Arrays)
    b) Arranging the given names in alphabetical order (String)

3. Program to demonstrate the following
    a) Area of a circle (class and objects)
    b) Students Mark Sheet (single inheritance)

4. Program to demonstrate the following
    a) Area of the shapes (interface)
    b) EB-Bill preparation (package)

5. Program to demonstrate the following
    a) Handling multiple exceptions
    b) Creating threads using Runnable interface

6. Program to demonstrate the following
    a) Copying the content of a File into another
    b) Object Serialization

7. Program to demonstrate the following
    a) Displaying geometrical objects on a window
    b) Parameter passing using HTML <applet> tag

8. Program to demonstrate the following
    a) Displaying the Zonal areas names using BorderLayout
    b) Simple user interface using AWT components

9. Program to demonstrate the simple client and server program using sockets

10. Program to demonstrate a simple distributed application using RMI

**Prepared by:**                                                    **Checked by:**

Dr. S. Abdul Saleem                                                 Mr. M. Kamal

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| III | 20UIT3GE1 | Generic Elective–I | FUNDAMENTALS OF IT | 2 | 2 | 100 | -- | 100 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Understand and remember the foundations and use of information systems
2. Understand about Database, Sorting , Searching, and Data mining
3. Examine the Computer Graphics, Multimedia and Animation techniques
4. Utilize the concept of Computer Networks
5. Apply Information Technology in Real- Time Applications

**UNIT I**                                                                                                        **6 hours**
Introduction: Computers – Classifications. Memory units. Input and Output Devices. Software: OS Programming languages – #Software packages#.

**UNIT II**                                                                                                       **6 hours**
Database – Record – Table - DBMS – #Sorting# – Searching, Data warehouse – Data mining.

**UNIT III**                                                                                                      **6 hours**
Computer Graphics – Multimedia – Tools – Virtual reality – Animations – applications.

**UNIT IV**                                                                                                      **6 hours**
Computer Networks – Types – Modem - #Internet# – Email – Ecommerce - Hypermedia.

**UNIT V**                                                                                                        **6 hours**
Computers – Home – Education and training – Business – Science - Medicine - #GIS#

**#.........# Self-Study portion**


**Text Book:**

Alex Leon, Mathews Leon, "*Fundamental of Information Technology",* Leon Vikas Publications, Chennai,1998.

**UNIT I**    **:** Chapter 1, 2, 6, 8-12
**UNIT II**   **:** Chapter 15, 28-30
**UNIT III :** Chapter 24, 26
**UNIT IV :** Chapter 18, 22, 28
**UNIT V  :** Chapter 32 - 35


**Books for Reference:**
Suresh K Bosandra, "Computers Today", Galgotia Publications Limited, New Delhi, 2010.


**Web Reference:**
https://www.dcs.bbk.ac.uk/study/modules/fundamentals-of-information-technology/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| III | 20UIT3GE1 | FUNDAMENTALS OF IT | | 2 | 2 |

| Course Outcomes COs | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| CO2 | ✓ | | | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 38, Relationship: High | | | | | | | | | | |

**Prepared by:**

Mr. P. Shaik Abdulla

**Checked by:**

Dr. S. Mohamed Iliyas

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| IV | 20UIT4CC7A | CORE-VII (a) | **RDBMS** | 5 | 3 | 50 | 10 | 40 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Understand architecture and data model of DBMS
2. Apply relational database, design ER modeling and describe formal language
3. Recognize and identify the use of normalization using FD and Constraints
4. Write advanced SQL queries in relational database
5. Perform curser management, Error Handling, package and trigger in PL/SQL

**UNIT I**                                                                                                   **15 hours**
Introduction to Databases: Introduction – Traditional File-Based Systems – Database Approach – Roles in Database Environment – Advantages and Disadvantages of DBMSs. Database Environment – The Three-Levels of ANSI-SPARC Architecture –#Database Languages# – Data Modeling.

**UNIT II**                                                                                                  **15 hours**
The Relational Model: Terminology – Views –Entity–Relationship Modeling: Entity Types – Relationship Types – Attributes – Strong and Weak Entity Types – #Attributes on Relationships# – Structural Constraints – The Relational Algebra

**UNIT III**                                                                                                 **15 hours**
Normalization: Purpose of Normalization – How Normalization Support Database Design – Data Redundancy and Update Anomalies – Functional Dependencies – First Normal Form – Second Normal Form – Third Normal Form. Advanced Normalization: More on Functional Dependencies – BCNF – Domain Constraints – Entity Integrity – #Referential Integrity#

**UNIT IV**                                                                                                  **15 hours**
SQL: Data Definition: Creating a Database – Creating a Table – Changing a Table Definition – Removing a Table – Views – SQL Commands – Data Manipulation: Simple Queries – Sorting – Aggregate Functions – Grouping – Sub queries – ANY and ALL – Multi-table Queries – #Combing Tables# – Database Updates

**UNIT V**                                                                                                   **15 hours**
Introduction to PL/SQL – Variables – Data Types – Control Structure – Cursors – Iterative Control Statement – PL/SQL Exception – Triggers – Types of Triggers – #Procedures and Packages#

**#.........# Self-Study portion**

**Text Books:**
1. Thomas M.Connolly, Carolyn E.Begg, *Database Systems A Practical Approach to Design, Implementation, and Management*, 4th Edition by , Pearson Education, Fifth Impression, 2012.

**UNIT I**:   Chapter 1: 1.1, 1.2, 1.3(1.3.1-1.3.4), 1.4, 1.6          Chapter 2: 2.1, 2.2(2.2.1, 2.2.2), 2.3(2.3.1, 2.3.2)
**UNIT II**:  Chapter 3: 3.2, 3.4                              Chapter 11: 11.1 – 11.6          Chapter 4: 4.1
**UNIT III**: Chapter 13: (13.1-13.4, 13.6-13.9) Chapter 14: (14.1.14.2) Chapter 6: 6.2(6.2.2 – 6.2.4)
**UNIT IV:** Chapter 6: 6.3(6.3.1 – 6.3.4)                    Chapter 5: 5.1 – 5.3

2. Alexis Leon and Mathews Leon, *Database Management Systems*, Vikas Publishing House Pvt. Ltd., New Delhi.
**UNIT V:** Chapter 32, 27

**Books for Reference:**
1. C.J Date, A Kannan and S. Swaminathan, *An Introduction to Database Systems*, 8th Edition, Pearson Education Asia.
2. Ramez Elmasri, Shamkant B. Navathe, *Fundamentals of Database Systems*, 5th Edition, Pearson Education LTD

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | | | | | | Hours | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| IV | 20UIT4CC7A | **RDBMS** | | | | | | | 5 | 3 |
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ |
| CO4 | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO5 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| **Number of Matches = 39, Relationship = High** | | | | | | | | | | |

**Prepared by:**                                                                 **Checked by**

Mr. S. Syed Ibrahim                                                          Mr. M. Kamal

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| IV | 20UIT4CC7I | CORE – VII (b) | INTERNSHIP | -- | 2 | 50 | 10 | 40 |

- At the end of Semester IV, during the summer vacation, the students should undergo an Internship in a reputed IT Company or in the IT Division of a reputed company after getting permission from the Department.

- The minimum number of days for Internship will be 30 days.

- A Project Report and a Certificate of Attendance should be submitted after completing the Internship for External Evaluation to the Department on the first day of Semester V.

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| IV | 20UIT4CC8P | CORE-VIII | MYSQL LAB - Practical | 3 | 2 | 100 | 20 | 80 |

1. **SQL: Data Definition Languages**

   Create table with Primary key, Candidate key,
   Foreign key, Check Constraints
   Table Alteration - Rename table and column name,
   Add column,
   Drop column,
   Modify column size and data type
   Drop table

2. **SQL: Data Manipulation Languages**

   Inserting Data into the table
   Range searching
   Update
   Tuple Variable
   Ordering Tuples
   Wildcard Characters
   Set operations
   Case statement
   Aggregate Functions – (average, minimum, maximum, sum, Count)
   -   Group by with having clause

   Nested Sub-queries –  (i) using (IN, NOT IN, SOME and ALL)
   (ii)   Sub-queries in the from clause
   (iii)  With clause
   Deletion –
   Removal -  all rows, specific rows,
   Using sub-queries
   Joins – Inner join
   Outer join – Left, Right, Full
   View

3. **PL/SQL Programs**

   Factorial of a given number using Recursive Function.
   Student Mark Sheet.
   Exception handling.

4. **SQL Forms**

   Employee Pay-Roll
   Electricity Bill
   Income Tax Calculation

**Prepared by**                                                                  **Checked by**

Mr. S. Syed Ibrahim                                                    Mr. O.S. Abdul Qadir

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| IV | 20UIT4AC7 | ALLIED–VII | LINUX BASICS | 5 | 3 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Acquire skills in fundamentals of Linux and Shell Programming
2. Use of Linux Files structure as a base for building Linux programs
3. Apply skills in the working environment of Linux
4. Know the advancement tools of LINUX
5. Understand the concept of inter process communication

**UNIT I**                                                         **15 hours**

Starting with Linux: Introduction to Linux – What is Linux – GNU Project and the free software foundation – Linux distributions – Programming Linux – Linux Programs – Text Editors – The C compiler. #Development System Road Map#.Shell Programming: What is Shell – pipes and Redirection – Shell as a programming language – Shell Syntax.

**UNIT II**                                                         **15 hours**

Working with files – Linux File structure – Library functions – Standard I/O Library – Formatted Input and Output – File and Directory Maintenance – Scanning Directories – Errors – Linux Environment: Program arguments – Environment variables – Time and date – Temporary files – User information –# Host information#-Logging-Resource and Limits.

**UNIT III**                                                      **15 hours**

Terminals: Terminal structure – Terminal Output – Detecting keystrokes –. Managing Text based screens with cursors: The screen – The keyboard – Windows – Sub windows - Using Color. Data Management – #Managing director# –File locking.

**UNIT IV**                                                     **15 hours**

Development tools – The make command and Make files – Source code control – RPM packages – other package formats. Debugging: General debugging techniques – Debugging with gdb – debugging tools.# Processes and signals: Process structure – Starting a new process – Signals-#POSIX Threads#

**UNIT V**                                                       **15 hours**

Inter-Process Communication: Pipes-Process pipes-The Pipe call. Semaphores: Definition-Linux semaphore facilities. Shared Memory –#Message Queues#-Sockets-Socket Connection - Network information.

**#.........# Self-Study portion**

**Text Book:**

Book Neil Matthew, Richard Stones, *Beginning Linux Programming*, 4th Edition, Wiley India Pvt. Ltd., 2014

**UNIT I**   : Chapter 1 and 2          **UNIT II**: Chapter 3 and 4         **UNIT III** : Chapter 5, 6 and 7
**UNIT IV**   : Chapter 9, 10, 11 and 12        **UNIT V**: Chapter 13, 14 and 15

**Books for Reference:**

Richard Petersen, *Linux – The Complete Reference*, Sixth Edition, Tata McGraw-Hill Publications

**Web References:**

https://www.digitalocean.com/community/tutorials/an-introduction-to-linux-basics
https://www.whoishostingthis.com/resources/linux-programming/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| IV | 20UIT4AC7 | LINUX BASICS | | 5 | 3 |
| Course Outcomes COs | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |
| CO3 | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| CO4 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| CO5 | | ✓ | ✓ | | ✓ | ✓ | | | | ✓ |
| Number of matches (✓) = 35 ,    Relationship: High | | | | | | | | | | |

**Prepared by**                                                                 **Checked  by**

Mr. A. Basheer Ahamed                                                   Mr. S. Peerbasha

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| IV | 20UIT4AC8P | ALLIED - VIII | SHELL PROGRAMMING LAB - Practical | 3 | 2 | 100 | 20 | 80 |

1. Program using do while and continue statements.

2. Program to check whether the user is eligible for vote or not.

3. Program to read two words one after another. Display the first word, go to sleep mode for 20 seconds using 'sleep' command. After 20 seconds, display the second word.

4. Program for finding the factorial of a given number using while loop.

5. Program to delete the files interactively using 'rm' command and 'while' statement.

6. Program using three arguments to take the pattern as well as input and output file names. If the pattern is found then display "Pattern Found" else display "Error Message". Also check whether right number of arguments is entered or not

7. Shell script to check whether the given string is palindrome or not

8. Shell script for using cp command to copy files. Display the necessary error message if error occurs.

9. Shell script for a file containing records with each record containing name of the city, name of the state and name of the country. Sort this file with *country* as the primary sort key and *state* as the secondary sort key.

10. Program to prepare the electricity bill based on the following conditions:

    1 to   50 units – Rs. 0

    51 to   100 units – Rs. 1.50/unit

    Above 100 units  – Rs. 3.00/unit

11. Program using Menu to copy, edit, rename and delete a file.

12. Simple shell script for mark sheet preparation with minimum of three subject marks.

13. Menu driven program for converting all the upper letters in a file to lower case letters and vice versa

14. Simple program for file operations.

15. Shell script program to add factorial value of any two given numbers.


**Prepared by**                                                          **Checked by**

Mr. A. Basheer Ahamed                                                Mr. S. Peerbasha

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| IV | 20UIT4GE2 | GENERIC ELECTIVE – II | IT INFRASTRUCTURE MANAGEMENT | 2 | 2 | 100 | -- | 100 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

1. Acquire knowledge of IT Infrastructure and management
2. Apply Service Delivery and Service Support Process in IT infrastructure management
3. Discuss about various storage levels in IT
4. Discuss various security techniques in information technology
5. Develop a new communication mechanism based on emerging trends in information technology

**UNIT I** **6 hours**
Introduction & IT Infrastructure : Computer Basics – Network and Internet – Computing resources – Information Technology. Introduction to IT Infrastructure Management – Challenges in IT Infrastructure Management – Design issues of IT organizations and IT Infrastructure – Determining customer requirements – IT systems management process – #IT service management process# – Information system design process.

**UNIT II** **6 hours**
Service Delivery Process & Service Support Process : Service level management – Financial management – T service continuity management – Capacity management – Availability management. Configuration management – Incident management – Problem management – Change management – **# Release management #**.

**UNIT III** **6 hours**
Storage Management : Introduction to storage – Backup and storage – Archive and retrieve – Disaster recovery – Space management – Database and application protection – Bare Machine Recovery (BMR) – **# Data Retention #**.

**UNIT IV** **6 hours**
Security Management & IT Ethics : Computer security – Internet security – Physical security – Identity management – Access control system – Intrusion detection. Intellectual property – Privacy and law – Computer Forensics – Ethics and Internet – **# Cyber crimes #**.

**UNIT V** **6 hours**
Emerging Trends in IT : Introduction – E-commerce – Electronic Data Interchange – Global system for mobile communication (GSM) - Bluetooth – **#Infrared Technology#**.


**#.........# Self-Study portion**

**Text Book:**
Phalguni Gupta, Surya Prakash, Umarani Jayaraman **,** *"IT Infrastructure and its Management"*, , Tata McGraw Hill Education Pvt. Ltd, Second Reprint 2010.

**UNIT – I** : Chapters 1 & 2, 1.1 to 1.5, 2.1 to 2.7  **UNIT – II** : Chapters 3 & 4, 3.1 to 3.5, 4.1 to 4.5
**UNIT – III** : Chapter 5, 5.1 to 5.8  **UNIT – IV :** Chapter 6 & 7, 6.2 to 6.7, 7.2 to 7.6
**UNIT – V** : Chapter 8, 8.1 to 8.6

**Books for References:**
1. Sanjeev Kumar Sharma, Rakesh Saini and Reena Sharma **"***IT Infrastructure and its Management***"**.
2. Surendra Keshari and Narendra Kumar **"***IT Infrastructure and its Management***",**.

**Web References:**

https://books.google.co.in

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| IV | 20UIT4GE2 | IT INFRASTRUCTURE MANAGEMENT | | 2 | 2 |
| Course Outcomes COs | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ | |
| CO2 | ✓ | | ✓ | | | | ✓ | | | ✓ |
| CO3 | ✓ | | | ✓ | | | | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | ✓ |
| CO5 | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| Number of matches (✓) = 25 ,     Relationship: Medium | | | | | | | | | | |

**Prepared by:**                                              **Checked by:**

**Dr. S. Mohamed Iliyas**                                    **Dr. S. Abdul Saleem**

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

# B.Sc. INFORMATION TECHNOLOGY

**THIRD YEAR SYLLABUS – 2020**
**( Semester V & VI )**

**Under**
**CHOICE BASED CREDIT SYSTEM**

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## PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

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**TIRUCHIRAPPALLI – 620 020**

# B.Sc. Information Technology

| SEM | COURSE CODE | PART | COURSE | COURSE TITLE | Ins.Hrs /Week | CREDIT | CIA | ESE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| I | 20U1LT1/LA1/LF1/LH1/LU1 | I | Language – I | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN1LE1 | II | English - I | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT1CC1 | III | Core – I | Programming Foundations | 5 | 5 | 25 | 75 | 100 |
| | 20UIT1CC2P | | Core – II | C Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT1AC1 | | Allied –I | Numerical Methods and Statistics | 5 | 4 | 25 | 75 | 100 |
| | 20UIT1AC2 | | Allied –II | Entrepreneurship Development | 3 | 2 | 25 | 75 | 100 |
| | 20UCN1AE1 | IV | AEC-I | Value Education | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **21** | | | **700** |
| II | 20U2LT2/LA2/LF2/LH2/LU2 | I | Language – II | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN2LE2 | II | English – II | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT2CC3 | III | Core – III | C++ Programming | 6 | 5 | 25 | 75 | 100 |
| | 20UIT2CC4P | | Core – IV | C++ Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT2AC3 | | Allied – III | Optimization Techniques | 4 | 3 | 25 | 75 | 100 |
| | 20UIT2AC4 | | Allied –IV | Digital Logics | 3 | 2 | 25 | 75 | 100 |
| | 20UCN2SE1 | IV | Skill Enhancement Course – I @ | Soft Skills Development | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **20** | | | **700** |
| III | 20U3LT3/LA3/LF3/LH3/LU3 | I | Language– III | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN3LE3 | II | English – III | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT3CC5 | III | Core– V | Data Structures | 4 | 4 | 25 | 75 | 100 |
| | 20UIT3CC6P | | Core– VI | Data Structures Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT3AC5 | | Allied– V | Java Programming | 4 | 3 | 25 | 75 | 100 |
| | 20UIT3AC6P | | Allied–VI | Java Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT3GE1 | IV | Generic Elective – I # | | 2 | 2 | - | 100 | 100 |
| | 20UCN3AE2 | | AEC-II | Environmental Studies | 2 | 2 | 100 | - | 100 |
| | | | | **TOTAL** | **30** | **21** | | | **800** |
| IV | 20U4LT4/LA4/LF4/LH4/LU4 | I | Language–IV | | 6 | 3 | 25 | 75 | 100 |
| | 20UCN4LE4 | II | English– IV | | 6 | 3 | 25 | 75 | 100 |
| | 20UIT4CC7A | III | Core– VII (a) | RDBMS | 5 | 3 | 10 | 40 | 50 |
| | 20UIT4CC7B | | Core – VII (b) | Internship | - | 2 | - | 50 | 50 |
| | 20UIT4CC8P | | Core - VIII | MySQL Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT4AC7 | | Allied– VII | Linux Basics | 5 | 3 | 25 | 75 | 100 |
| | 20UIT4AC8P | | Allied–VIII | Shell Programming Lab - Practical | 3 | 2 | 20 | 80 | 100 |
| | 20UIT4GE2 | IV | Generic Elective – II # | | 2 | 2 | -- | 100 | 100 |
| | 20UCN4EA | V | Extension Activities | NCC, NSS, etc. | - | 1 | -- | -- | -- |
| | | | | **TOTAL** | **30** | **21** | | | **700** |
| V | 20UIT5CC9 | III | Core – IX (a) | Web Programming | 4 | 3 | 10 | 40 | 50 |
| | 20UIT5CC9P | | Core – IX (b) | Web Programming Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT5CC10 | | Core – X | Operating Systems | 5 | 5 | 25 | 75 | 100 |
| | 20UIT5CC11 | | Core – XI | Python Programming | 5 | 5 | 25 | 75 | 100 |
| | 20UIT5CC12 | | Core - XII (a) | Multimedia | 3 | 3 | 10 | 40 | 50 |
| | 20UIT5CC12P | | Core - XII (b) | Python Programming Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT5DE1A/B | | DSE – I ** | | 5 | 4 | 25 | 75 | 100 |
| | 20UIT5SE2AP/BP | IV | Skill Enhancement Course – II @ | | 2 | 2 | - | 100 | 100 |
| | 20UIT5SE3AP/BP | | Skill Enhancement Course – III @ | | 2 | 2 | - | 100 | 100 |
| | 20UCN5EC1 | | Extra Credit Course – I | General Intelligence for Competitive Examinations | - | 4* | - | 100* | 100* |
| | | | | **TOTAL** | **30** | **28** | | | **700** |
| VI | 20UIT6CC13 | III | Core– XIII | Computer Networks | 5 | 4 | 25 | 75 | 100 |
| | 20UIT6CC14 | | Core– XIV | PHP Programming | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6CC15 | | Core - XV | Cyber Forensics | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6CC16P1 | | Core - XVI (a) | Document Process Tools Lab - Practical | 2 | 2 | 10 | 40 | 50 |
| | 20UIT6CC16P2 | | Core - XVI (b) | PHP Programming Lab - Practical | 3 | 3 | 10 | 40 | 50 |
| | 20UIT6DE2A/B | | DSE – II ** | | 5 | 5 | 25 | 75 | 100 |
| | 20UIT6DE3AP/BP | | DSE – III ** | | 4 | 4 | 20 | 80 | 100 |
| | 20UCN6AE3 | IV | AEC-III | Gender Studies | 1 | 1 | 100 | - | 100 |
| | 20UIT6EC2 | | Extra Credit Course - II | Information Technology for Competitive Examinations | - | 4* | - | 100* | 100* |
| | 20UITAECA | | Extra Credit Course for All | Online Course | - | 1* | - | - | - |
| | | | | **TOTAL** | **30** | **29** | | | **700** |
| | | | | **GRAND TOTAL** | **180** | **140** | **-** | **-** | **4300** |

**\* Not Considered for Grant Total and CGPA.**

**# GENERIC ELECTIVE FOR OTHER MAJOR DEPARTMENT**

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| III | 20UIT3GE1 | Fundamentals of IT |
| IV | 20UIT4GE2 | IT Infrastructure Management |

**@ SKILL ENHANCEMENT COURSE**

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| V | 20UIT5SE2AP | Software Testing Lab - Practical |
| | 20UIT5SE2BP | VB.NET Lab - Practical |
| | 20UIT5SE3AP | System Programming Lab - Practical |
| | 20UIT5SE3BP | Animation Lab - Practical |

**** DISCIPLINE SPECIFIC ELECTIVES**

| SEMESTER | COURSE CODE | COURSE TITLE |
|---|---|---|
| V | 20UIT5DE1A | Software Engineering |
| | 20UIT5DE1B | VB.NET |
| VI | 20UIT6DE2A | Data Mining |
| | 20UIT6DE2B | R Programming |
| | 20UIT5DE3AP1 | Data Mining using WEKA Lab - Practical |
| | 20UIT5DE3BP2 | R Programming Lab - Practical |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| V | 20UIT5CC9 | Core–IX (a) | WEB PROGRAMMING | 4 | 3 | 50 | 10 | 40 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Understand, analyze and build dynamic web pages
CO 2. Realize the current and evolving web development Libraries and Frameworks
CO 3. Create interactive components in web pages
CO 4. Incorporate best practices in navigation, usability in website design
CO 5. Design websites adhering to current web standards

**UNIT I**                                                                                                                    **12 hours**
Traditional HTML and XHTML: HTML and XHTML: Version History - (X)HTML Document Structure -  The Rules of (X)HTML  - HTML and XHTML Element Reference: Flavors of HTML and XHTML - Core Attributes Reference - Language Attributes Reference - Other Common Attributes Reference - Common HTML5 Attributes Reference - Event Attributes Reference - HTML Element Reference

**UNIT II**                                                                                                                   **12 hours**
Introduction to CSS: CSS Versions - Applying Style to a Document -  Media Types - Alternative Styles - User Styles - Selectors - CSS Syntax and Property Reference: Style Inclusion Methods - CSS Measurements - CSS Strings and Keywords - CSS Color Values - CSS1 and CSS 2.1 Properties - CSS3 Proprietary and Emerging Features Reference**.**

**UNIT III**                                                                                                                 **12 hours**
Getting Started with JavaScript Programming: Basic Concepts - JavaScript Syntax Rules -  Working with Document Object Model: Understanding the Document Object Model - Using Window Objects - Working with the Document Object - Working with the Location Object - Working with DOM Nodes - Using JavaScript Variables, Strings and Arrays: Using Variables - Understanding Expressions and Operators - Data Types in JavaScript -  Using String Objects - Using Numeric Arrays - Using String Arrays.

**UNIT IV**                                                                                                                  **12 hours**
Using JavaScript Functions and Objects: Using Functions - Introducing Objects - Extending Built-in Objects - Using the Math Object - Working with Math Functions - Working with Dates - Controlling Flow with Conditions and Loops: The if Statement - Testing Multiple Conditions with if and else - Using Multiple Conditions with Switch - Using for Loops - Using while Loops -  Using do...while Loops.

**UNIT V**                                                                                                                   **12 hours**
Responding to Events: Understanding Event Handlers - Using Mouse Events - Using Keyboard Events - Using the onLoad and onUnload Events - Using Windows and Frames: Displaying Dialog Boxes - Working with Frames - AJAX: Remote Scripting: Introducing AJAX - Using XMLHttpRequest - Creating a Simple AJAX Library - Creating an AJAX Quiz using the Library.

**TextBooks:**
1. Thomas A. Powell, "HTML & CSS: The Complete Reference", The McGraw-Hill Companies, Fifth Edition, 2010
 **UNIT I**: Chapter 1, Chapter 3
**UNIT II**: Chapter 4, Chapter 5, Chapter 6

2.  Julie C. Meloni, "Sams Teach Yourself HTML, CSS and JavaScript All in One", Pearson Education, 2012
**UNIT III**: Chapter 14, Chapter 15, Chapter 16
**UNIT IV**: Chapter 17, Chapter 18
**UNIT V**: Chapter 19, Chapter 20, Chapter 24

**Books for Reference:**
 1. P. J. Deitel, H. M. Deitel, "Internet & World Wide Web How to Program", Pearson Prentice Hall, 4th Edition, 2008
 2. Danny Goodman, "JavaScript Bible", Hungry Minds, 4th Edition, 2001

**Web References:**

1.  https://www.codecademy.com/learn/introduction-to-javascript
2.  https://www.coursera.org/learn/html-css-javascript-for-web-developers

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | | Hours | Credits | | | |
|---|---|---|---|---|---|---|---|---|---|
| V | 20UIT5CC9 | WEB PROGRAMMING | | | 4 | 3 | | | |
| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| CO2 | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 44, Relationship: High | | | | | | | | | | |

**Preparedby:**                                                        **Checkedby:**

Lt. J. Hajiram Beevi                                                  Dr. S. Abdul Saleem

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5CC9P | Core – IX (b) | WEB PROGRAMMING LAB - PRACTICAL | 2 | 2 | 50 | 10 | 40 |

1. Design a Login Page which contains Login Field, Password Field, Submit and Reset Buttons using HTML.

2. Design a Catalogue Page in HTML using Table Tag.

3. Create a CSS to design Menu.

4. Design a Bio data using CSS.

5. Design a web page that contains a selection box with a list of 5 countries, When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

6. Develop a simple calculator to perform the basic operations using JavaScript.

7. Develop a JavaScript codeto find the position of left most vowel in a given string.

8. Develop a JavaScript code that calculates the square and cube of numbers from 0 to 10 and outputs HTML text that displays the resulting values in an HTML table format.

9. Develop a JavaScript code to create a simple multiplication table for given rows and columns

10. Develop a JavaScript code that displays text "TEXT-GROWING" with increasing font size in the interval of 100ms inRED COLOR, when the font size reaches 50pt it displays "TEXT-SHRINKING" in BLUE color.Then the font size decreases to 5pt.

11. Develop a JavaScript code to sum the multiples of 3 and 5 under 100.

12. Develop a JavaScript code for iterating 15 times and for each iteration, it should check and display whether the current Number is odd or even.

**Prepared by:**                                                        **Checked by**:
Lt. J. Hajiram Beevi                                              Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5CC10 | CORE -X | OPERATING SYSTEMS | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Understand the basic conceptsof Operating Systems
CO 2. Analyse the different kinds of memory management techniques
CO 3. Acquire the knowledge of process state, process scheduling and handling deadlocks
CO 4. Understand the device functionalities and the relationships between the devices and the Processor
CO 5. Understandthe basic concepts of file, its various allocation strategies and access methods

**UNIT I** **15 hours**

Operating System Overview – Basic Concepts and Terminologies – Operating System asResource Manager – Process View Point – Hierarchical and Extended Machine View – I/OProgramming and Interrupt Programming – I/O Programming – Interrupt Structure and Processing.

**UNIT II** **15 hours**

Memory Management – Single Contiguous Allocation – Multiprogramming – Partitioned Allocation – Relocatable Partitioned Memory Management – Paged Memory Management – PageRemoval Algorithms – Thrashing – Segmented Memory Management – Segmented and DemandPaged Memory Management.

**UNIT III** **15 hours**

Process Management – Process State Model – Job Scheduling – Process Scheduling –Multiprocessor Systems – Process Synchronization – Resolving Deadlocks.

**UNIT IV** **15 hours**

Device Management – Techniques – Device Characteristics – I/O Traffic Controller – I/OScheduler and Device Handlers – Virtual Devices – Spooling.

**UNIT V** **15 hours**

Information Management: File System Model – Symbolic, Basic File System – AccessControl Verification – Logical, Physical File System – Allocation Strategy, Device StrategyModules.

**Text Book**:
S.E. Madnick & J. J. Donovan, *Operating Systems*, McGraw Hill International Book Co, New Delhi,2017.

**Books for Reference:**

1. Harvey M. Deitel, *An Introduction to Operating Systems*, Addison-Wesley Publishing Co., NewYork, 1984.

2. James L. Peterson & Abraham Silbertschatz, *An Introduction to Operating Systems*, Addison-Wesley Publishing Co., New York, 1987.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| V | 20UIT5CC10 | OPERATING SYSTEMS | | 5 | 5 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| CO2 | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| CO3 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO4 | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| CO5 | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Number of matches (✓) = 37, Relationship: High | | | | | | | | | | |

**Prepared by:**

Dr. D.I. George Amalarethinam

**Checked by:**

Dr. G. Ravi

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT5CC11 | CORE-XI | PYTHON PROGRAMMING | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1.  Understand the building blocks of Python Programming
CO 2.  Apply the various control structures and functions to real time problems
CO 3.  Perform the List, Tuple and Dictionary concepts
CO 4.  Implement the MySQL queries and File handling operations with applications
CO 5.  Understand the concepts of Classes and Object-Oriented Programming

**UNIT I**                                                                                                                      **15 hours**
Introduction: Using Python - Input, Processing and Output: Displaying Output with the print Function - Comments - Variables - Reading Input from the Keyboard - Simple Functions: Introduction to Functions - Defining and Calling a Function -  Local Variables  - Passing Arguments to Functions - Global Variables and Global Constants.

**UNIT II**                                                                                                                     **15 hours**
Decision Structures and Boolean Logic: The if Statement - The if-else Statement - Comparing Strings - Nested Decision Structures and the if-elif-else Statement -  Logical Operators  - Boolean Variables - Repetition Structures: The while Loop: a Condition-Controlled Loop - The for Loop: a Count-Controlled Loop - Sentinels - Input Validation Loops - Nested Loops

**UNIT III**                                                                                                                    **15 hours**
Value-Returning Functions and Modules: Introduction to Value-Returning Functions: Generating Random Numbers - Writing Your Own Value-Returning Functions - The math Module - Storing Functions in Modules - Files and Exceptions: Introduction to File Input and Output - Using Loops to Process Files - Processing Records – Exceptions.

**UNIT IV**                                                                                                                     **15 hours**
Lists and Tuples: Sequences - Introduction to Lists - List Slicing - Finding Items in Lists with the in Operator - List Methods and Useful Built-in Functions -  Copying Lists  - Processing Lists - Two-Dimensional Lists - Tuples - More About Strings: Basic String Operations - String Slicing - Testing, Searching and Manipulating Strings - Dictionaries and Sets: Dictionaries - Sets - Serializing Objects.

**UNIT V**                                                                                                                      **15 hours**
Classes and Object-Oriented Programming: Procedural and Object-Oriented Programming - Classes - Working with Instances - Techniques for Designing Classes - Inheritance: Introduction to Inheritance - Polymorphism - Getting MySQL for Python -  import MySQL for Python  -MySQLDb - Connecting with a Database.

**Text Books:**
1.Tony Gaddis, "*Starting Out with Python*", Addison-Wesley Pearson Education, 2nd Edition, 2012
**UNIT I:** Chapter 2 (2.3 - 2.6), Chapter 3 (3.1, 3.2, 3.4, 3.5, 3.6)
**UNIT II**: Chapter 4 (4.1 - 4.6), Chapter 5 (5.2, 5.3, 5.5, 5.6, 5.7)
**UNIT III**: Chapter 6 (6.1 - 6.4) , Chapter 7 (7.1 - 7.4)
**UNIT IV**: Chapter 8 (8.1 - 8.9), Chapter 9 (9.1 - 9.3), Chapter 10 (10.1 - 10.3)
**UNIT V**: Chapter 11 (11.1 - 11.4), Chapter 12 (12.1, 12.2)

2.Albert Lukaszewski, "*MySQL for Python*", Packt Publisher, 1st Edition, 2010.
**UNIT V**: Chapter 1

**Book for Reference:**
Mark Lutz, "*Programming Python*", O'Reilly, Media, Inc. Publisher, 4th Edition, 2010

**Web References:**
1. https://onlinecourses.nptel.ac.in/noc19_cs59/preview
2. https://www.learnpython.org/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| V | 20UIT5CC11 | PYTHON PROGRAMMING | | 5 | 5 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO2 | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO3 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| CO4 | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| CO5 | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| Number of matches (✓) = 37, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                 **Checked by:**
Mr. S. Syed Ibrahim                                                          Dr. K. Nafees Ahmed

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5CC12 | CORE-XII(a) | MULTIMEDIA | 3 | 3 | 50 | 10 | 40 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Understand the usage of multimedia in various areas
CO 2. Understand the various operations on Text, Images and Sound
CO 3. Examine the animation and video techniques in multimedia
CO 4. Utilize multimedia project, hardware and software
CO 5. Apply multimedia products in the Internet
.

**UNIT I** **9 hours**
Introduction: What is Multimedia?–Definition–Where to use Multimedia – Delivering Multimedia–TEXT:AboutFontandfaces–UsingTextinMultimedia: Designing with Text–Fields for Reading – HTML Documents.

**UNIT II** **9 hours**
Images: Making Still Images - Image File Format-Sound: Power of Sound – Digital Audio – MIDI Audio – MIDI vsDigitalAudio–Audiofileformat-Addingsoundtoyour project: Audio recording-Keeping track of your sound-Audio CD-Sound for your Mobile- Sound for the Internet**.**

**UNIT III** **9 hours**
Animation: Principles–Animation by computer-Making Animations that Work-Video: Using video–Digital Video Containers–Obtaining Video Clips.

**UNIT IV** **9 hours**
MakingMultimedia:Thestagesofamultimediaproject–Whatyouneed–The Intangibles: Creativity-Organization-Communication. Hardware: Windows vs Macintosh-connection-Memory and storage devices-Input & Output devices.Software: Text Editing and Word Processing Tools- OCR Software-Painting and Drawing Tools-3D Modeling and Animation Tools-Image-Editing Tools-Sound-Editing Tools.

**UNIT V** **9 hours**
MultimediaSkills: TheTeam: Project Manger-Multimedia Designer-Interface Designer-Writer-Video Specialist-Audio-Specialist-Multimedia Programmer-Producer of Multimedia for the web. The Internet and Multimedia: Internetworking: Internet Addresses-Connections-Internet Services-MIME Types-The World Wide Web and HTML. Multimedia on the Web: Tools for theWorld Wide Web-Web Servers-Web Browsers-Search Engines.

**Text Book:**
Tay Vaughan, *Multimedia Making it Work*, Tata McGraw – Hill Edition, Eighth Edition, 2011
**UNITI:**Chapter 1 & 2    **UNITII:**Chapter 3 & 4    **UNITIII:**Chapters5 & 6
**UNITIV:**Chapter7    **UNITV:**Chapters 8 & 12

**Books for Reference:**
1. V.K. Jain, *Introduction to Multimedia and its applications*, Khanna Publishing, 2012.
2. DavidHillman,*MultimediaTechnologyandApplications,*GalgotiaPublications.

**Web Reference:**
https://www.omicsonline.org/conferences-list/multimedia-tools-and-applications.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| V | 20UIT5CC12 | MULTIMEDIA | | 3 | 3 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| CO2 | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO4 | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 38, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                         **Checked by:**

Mr. P.  Sheik Abdulla                                                    Dr. S. Abdul Saleem

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5CC12P | Core - XII (b) | PYTHON PROGRAMMING LAB - PRACTICAL | 2 | 2 | 50 | 10 | 40 |

**Develop programs inPython to**

1. Demonstrate different Number datatypes.

2. Find the NCR values of a given number using Functions.

3. Print whether a number is positive/negative using *if-else* statement.

4. Find whether the given value is prime or not using *if-elif* statement.

5. Compute the number of vowels, consonants and words in a file.

6. Print all of the unique words in a file in alphabetical order.

7. Define a module to find odd or evennumbers between 1 and 100 and import the module
   to another program.

8. Create a list and perform the following methods:

   a) insert()    b) remove()    c) append()    d) len() e) pop()

9. Create a tuple and perform the following operations:

   a) Concatenation    b) Repetition    c) Membership

   d) Access items e) Slicing

10. Sort (ascending and descending) a dictionary by value.

11. Find the area of a rectangle using Class and Object.

12. Perform various database operations (Create, Insert, Delete, Update) using MySQL.

Prepared by:                                        Checkedby:

Mr. S. Syed Ibrahim                                 Dr. K. Nafees Ahmed

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| V | 20UIT5DE1A | Discipline Specific Elective-I | SOFTWARE ENGINEERING | 5 | 4 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**
CO 1. Understand the different software process models
CO 2. Acquire the knowledge of software system requirements
CO 3. Understand the system design process
CO 4. Analyse the various software testing methods
CO 5. Understand the software quality assurance and metrics

**UNIT I** **15 hours**
Software and Engineering: The Nature of Software – The Unique Nature of WebApps – Software Engineering – The Software Process –Software Myths – A Generic Process Model – Prescriptive Process Models: The Waterfall Model – Incremental Process Model – Evolutionary Process Models – Concurrent Models – Specialized Process Models: Component-Based Development – The Formal Methods Model – Aspect-Oriented Software Development.

**UNIT II** **15 hours**
Understanding Requirements: Requirements Engineering – Establishing the Groundwork – Eliciting Requirements – Developing Use Cases – Building the Requirements Model – Negotiating Requirements – Validating Requirements – Requirements Analysis – UML Models That Supplements the Use Case – Data Modeling Concepts – Flow-Oriented Modeling – Creating a Behavioral Model.

**UNIT III** **15 hours**
Design Concepts: The Design Process -- Design Concepts – The Design Model – Architectural Design: Software Architecture – Architectural Genres – Architectural Styles – Architectural Design – Assessing Alternative Architectural Designs– Architectural Mapping Using Data Flow.

**UNIT IV** **15 hours**
Software Testing Strategies: A Strategic Approach to Software Testing – Test Strategies for Conventional Software – Unit Testing – Integration Testing – Validation Testing – System Testing – The Art of Debugging – Testing Conventional Applications: Software Testing Fundamentals – White-Box Testing – Basis Path Testing – Control Structure Testing – Black-Box Testing – Object-Oriented Testing Methods**.**

**UNIT V** **15 hours**
Quality Concepts: Software Quality – Achieving Software Quality -- Formal Technical Reviews –Software Quality Assurance: Elements of SQA – SQA Tasks, Goals and Metrics – Statistical SQA – Software Reliability – Process and Project Metrics: Metrics in the Process and Project Domains -- Software Measurement – Metrics for Software Quality– Establishing a Software Metrics Program.

**Text Book:**

Roger S. Pressman, *Software Engineering - A Practitioner's Approach*, McGraw Hill International Edition, Seventh Edition, 2010.

UNIT I : Chapter 1 (Sections 1.1, 1.2, 1.3, 1.4 & 1.6), Chapter 2 (Sections 2.1, 2.3 & 2.4)
UNIT II: Chapter 5 (Sections 5.1 -- 5.7), Chapter 6 (Sections 6.1,6.2 & 6.4) & Chapter 7 (Sections 7.2 & 7.3)
UNIT III: Chapter 8 (Sections 8.2,8.3 & 8.4), Chapter 9 (Sections 9.1 – 9.6)
UNIT IV: Chapter 17 (Sections 17.1, 17.3,17.6, 17.7 & 17.8) & Chapter 18 (Sections 8,1, 18.3, 18.4, 18.5 & 18.6)
           & Chapter 19 (Section 19.4)
UNIT V: Chapter 14 (Sections 14.2 & 14.4), Chapter 15 (Section 15.6), Chapter16 (Sections 16.2 16.3,
           16.5 & 16.6) & Chapter 25 (Sections 25.1 - 25.3 & 25.6)

**Books for Reference:**

1. Shari Lawrence Fleeger and Joanne M. Atlee, *Software Engineering: Theory and Practice*, Pearson Education South Asia, New Delhi, Fourth Edition, Third Impression 2013.
2. Ian Sommerville, *Software Engineering*, Pearson Education Asia, New Delhi, Ninth Edition, 2015.
3. Jibitesh Mishra, *Software Engineering*, Pearson Education, First Edition, 2011.
4. RohitKhurana, *Software Engineering Principles and Practices*, Vikas Publishing House, Second Edition, 2010.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| V | 20UIT5DE1A | SOFTWARE ENGINEERING | | 5 | 4 |
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| CO3 | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | |
| CO4 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Number of matches (✓) = 36, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                         **Checked by:**

Mr. M. Abdullah                                                          Dr. K. NafeesAhamed

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5DE1B | Discipline Specific Electives-I | VB .NET | 5 | 4 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Acquire the working knowledge of window-based application development
CO 2. Use the controls and functions for creating user interface design
CO 3. Utilize the various dialog controls for more interactions
CO 4. Apply the Object Oriented Concepts in program development
CO 5. Design and implement database connectivity using ADO.NET

**UNIT I**               **15 hours**
The .NET Framework and the Common Language Runtime - Building VB.NET Applications - The Visual Basic Integrated Development Environment - The Visual Basic Language: Keywords – Visual Basic Statements - Constants – Variables – Data Types – Arrays – Strings - Operators - Making Decisions with If...Else Statements - Using Select Case - Making Selections with Switch and Choose - Looping Statements - Do Loop -For Loop - For Each...Next Loop - While Loop – With Statement.

**UNIT II**               **15 hours**
Sub Procedures and Functions - Understanding Scope - Handling Exception – Creating Sub Procedures – Creating Functions -Windows Forms – Creating Windows Applications – Adding Control to Forms – Handling Events - MsgBox Function – MessageBox.Show Method –InputBox Function –Working with Multiple Forms – Handling Mouse Events – Handling Keyboard Events – Text Boxes – Rich Text Boxes – Labels.

**UNIT III**              **15 hours**
Buttons - Checkboxes - Radio Buttons - Panels - Group Boxes - List Boxes – Checked List Boxes - Combo Boxes – Picture Boxes – Scroll Bars – Splitters – Pickers - Timers – Menus – Built in Dialog Boxes – Open File Dialogs – Save File Dialogs – Font Dialogs – Color Dialogs.

**UNIT IV**              **15 hours**
Image Lists – Tree Views – List Views – Toolbars – Status Bars – Progress Bars - Tab Controls - Object-Oriented Programming – Creating Classes – Creating Objects – Creating Modules – Creating Constructors – Creating Data Members - Creating Methods – Object-Oriented Inheritance – Access Modifiers –Inheriting from a Base Class – Using Public Inheritance – Using Protected Inheritance – Using Private Inheritance.

**UNIT V**               **15 hours**
Databases – Accessing Data with the Server explorer – Accessing Data with Data Adaptors and Datasets – Working with ADO.NET– Overview of ADO .NET Objects– Using Basic SQL – Creating a New Data Connection – Creating a Dataset – Populating a Dataset – Displaying Data in a Data Grid – Selecting a Data Provider – Data Access Using Data Adapter Controls - Connecting to an MS Jet Database – Using Relational Databases – Adding Multiple tables to a Dataset – Using Data Views – Simple Binding – Complex Binding – Binding Data to Controls – Navigating in Datasets.

**Text Books:**
Steven Holzner, *Visual Basic .NET Programming Black Book*, Dreamtech Prublisher, Edition. Aug. 2007
**UNIT I:** Chapters 1 & 2           **UNIT II:** Chapters 3, 4 & 5
**UNIT III:** Chapters 6, 7, 8 & 9      **UNIT IV:** Chapters 10,11& 12
**UNIT V:** Chapters 21 & 22

**Books for Reference:**
1. C. Muthu, *Visual Basic .Net*, Vijay Nicole Imprints Pvt. Ltd.Publisher, 2007.
2. ShirishChavan, *Visual Basic .Net*, Pearson Education, 2009.

**Web References:**
https://www.tutorialspoint.com/vb.net/index.htm
https://www.javatpoint.com/vb-net
https://www.youtube.com/watch?v=1D7UDmxdu3g

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| V | 20UIT5DE1B | VB .NET | | 5 | 4 |
| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| CO2 | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Number of matches (✓) = 40, Relationship: High | | | | | | | | | | |

**Preparedby:**                                                                                    **Checkedby:**

Mr. A. Jainulabudeen                                                                       Dr. S. Mohamed Iliyas

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5SE2AP | Skill Enhancement Course - II | SOFTWARE TESTING LAB - PRACTICAL | 2 | 2 | 100 | --- | 100 |

1. Install Selenium IDE: Develop a test suite containing minimum 4 test cases for different formats.

2. Perform a test suite for any two websites.

3. Install Selenium Web Server and demonstrate it using a script in Java.

4. Develop and test a program to login a specific web page.

5. Develop and test a program to update 5 employee records into table and into Excel file.

6. Develop and test a program to select the number of students who have scored more than 75 in any one subject.

7. Develop and test a program to find out list of employees having salary greater than Rs. 25,000 and age between 35 and 45 years.

8. Develop and test a program to provide total number of objects available on a web page.

9. Develop and test a program to get the number of list items in a list / combo box.

10. Develop and test a program to count the number of check boxes on a page checked and unchecked count.

11. Develop a test plan document for Library Management System.


**Prepared by:**                                                    **Checked by:**

Mr. M. Abdullah                                                    Dr. K. Nafees Ahamed

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5SE2BP | Skill Enhancement Course-II | VB .NET LAB - PRACTICAL | 2 | 2 | 100 | --- | 100 |

**Develop the programs in VB .NET to**

1. a) Accept any character from keyboard and display whether it is a vowel or not.

   b) Find the area of a circle (Using console application).

2. Reverse a given number (Using window application).

3. Create and validate a login form using select case.

4. Find factorial of a given number using function.

5. Handle any three types of exceptions.

6. Illustrate the use of MsgBox and InputBox Functions

7. Illustrate the use of Checkbox, Radio Buttons and List Box Control

8. Create a stopwatch using timer control.

9. Implement a text editor with cut, copy, paste, save and close operations using menus.

10. Illustrate the use of Tree View and List View.

11. Accept 5 values from Combo Box and display average in MsgBox function using class.

12. Develop a database application to store the details of students using ADO.NET.

13. Develop a database application using ADO.NET to demonstrate insert and delete operations

**Prepared by:**                                                        **Checked by:**

Mr. A. Jainulabudeen                                                 Mr. M. Abdullah

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| V | 20UIT5SE3AP | Skill Enhancement Course-III | SYSTEM PROGRAMMING LAB - PRACTICAL | 2 | 2 | 100 | --- | 100 |

**Develop the programs in C/C++ to**

1. Display the list of all files/directory names in alphabetical order for a given file path.

2. Create a new directory. Suppose the given directory already exists, display the alert message as "Directory Already Exists".

3. Display the following file properties
   a. Size of the file
   b. Created Date
   c. Extension of the filename
   d. Check it is read only
   e. Renaming the file

4. Check the following details of a file or directory
   a. Read and Write permission.
   b. Last modified time

5. Display the total space, free space, and used space of a given Drive and display the storage size in the format of GB, MB, KB and Bytes.

6. Merge the two given files

7. Perform the following operations:
   a. Log off the computer
   b. Restart the computer
   c. Shutdown the computer

8. Implement FIFO page replacement algorithm

9. Implement the First Come First Serve (FCFS) Job Scheduling algorithm

10. Implement the non pre-emptiveShortest Job First (SJF) JobScheduling algorithm

**Prepared by:**                                              **Checked by:**

Mr. M. Kamal                                                   Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| V | 20UIT5SE3BP | Skill Enhancement Course-III | ANIMATION LAB - PRACTICAL | 2 | 2 | 100 | --- | 100 |

**Practical Exercises using GIMP**

1.  Design a Greeting card

2.  Design an Invitation

3.  Design a Logo for Business Card

4.  Design an Identity Card

5.  Design a Book Wrapper

6.  Color a black and white photo

7. Place an Image in Text

**Practical Exercises using PENCIL 2D**

8.  Change a Circle into a Square in Flash

9.  Animate a Ball bouncing on Steps

10.  Simulate a Ball Hitting another Ball

11.  Create an Animation to represent the Growing Moon

12.  Simulate Movement of the Cloud

13.  Animate the Text

14.  Animate a Butterfly


**Prepared by:**                                                   **Checked by:**

Mr. P. Sheik Abdulla                                         Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT6CC13 | CORE – XIII | COMPUTER NETWORKS | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO1. Understand the fundamental concepts of network topologies and protocols.
CO2. Know the working principles of data communication and switching networks.
CO3. Acquire the knowledge of protocols for datalink layers and internetworking devices.
CO4. Analyse the various routing and congestion control algorithms.
CO5. Understand the protocols for transport and application layers.

**UNIT I** **15 hours**
Introduction – Uses of Computer Networks – Network Hardware: Personal Area Networks –Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Internetworks - Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection-Oriented Versus Connectionless Service – Service Primitives. Reference Models: The OSI Reference Model – The TCP/IP Reference Model.

**UNIT II** **15 hours**
The Physical Layer: Guided Transmission Media – Digital Modulation and Multiplexing: Baseband Transmission – Frequency Division Multiplexing  – The Public Switched TelephoneNetwork: Structure of the Telephone System – The Politics of Telephones – The Local Loop: Modems, ADSL, and Fiber – Trunks and Multiplexing – Switching.

**UNIT III** **15 hours**
The Data Link Layer: Data Link Layer Design Issues: Services Provided to the NetworkLayer – Framing – Error Control – Flow Control. Error Detection and Correction – Elementary Data Link Protocols –Sliding Window Protocols – The Medium Access Control Sub – layer: Data Link Layer Switching: Uses of Bridges – Learning Bridges – Spanning Tree Bridges –  Repeaters, Hubs, Bridges, Switches, Routers, and Gateways .

**UNIT IV** **15 hours**
The Network Layer: Network Layer Design Issues – Routing Algorithms: The OptimalityPrinciple – Shortest Path Algorithm – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Congestion Control Algorithms: Approaches to Congestion Control – Traffic-Aware Routing –  Admission Control  – The Network Layer in the Internet – The IP Version 4 Protocol – IP Addresses.

**UNIT V** **15 hours**
The Transport Layer: The Transport Service: Services Provided to the Upper Layers –Transport Service Primitives – Berkeley Sockets – Elements of Transport Protocols – The Application Layer: DNS: The Domain Name System – The DNS Name Space –  Domain Resource Records  – Electronic Mail: Architecture and Services – The User Agent – Message Format.

**Text Book:**
Andrew S. Tanenbaum and David J. Wetherall, *Computer Networks*, PHI, 5th Edition, 2011.

**UNIT I:** Chapter 1 (Sections 1.1, 1.2, 1.3.1 to 1.3.4, 1.4.1, 1.4.2)
**UNIT II:** Chapter 2 (Sections 2.2, 2.5.1, 2.5.3, 2.6)
**UNIT III:** Chapter 3 (Sections 3.1, 3.2, 3.3, 3.4) & Chapter 4 (Section 4.8.4)
**UNIT IV:** Chapter 5 (Sections 5.1, 5.2.1, 5.2.2, 5.2.4 to 5.2.7, 5.3.1 to 5.3.3, 5.6.1, 5.6.2)
**UNIT V:** Chapter 6 (Sections 6.1.1 to 6.1.3, 6.2) & Chapter 7 (Sections 7.1.1, 7.1.2, 7.2.1 to 7.2.3)

**Books for Reference:**
1. Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw-Hill, FourthEdition, 2007.
2. William Stallings, *Data and Computer Communication*, PHI, Tenth Edition, 2013.

**Web Reference:**

https://www.slideshare.net/pawan1809/computer-networks-a-tanenbaum-5th-edition

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| VI | 20UIT6CC13 | COMPUTER NETWORKS | | 5 | 5 |
| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| CO3 | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | |
| CO5 | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| Number of matches (✓) = 36, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                    **Checked by:**

Dr. G. Ravi                                                                         Mr. S. Syed Ibrahim

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | TitleoftheCourse | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT6CC14 | CORE–XIV | PHP PROGRAMMING | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes(COs):**

**After completion of the course, students will be able to**
CO 1. Understand the use of datatypes, expressions, operators, control statements, functions, strings and arrays
CO 2. Apply the object-oriented concepts in handling with forms and files
CO 3. Understand the cookies and sessions
CO 4. Develop a website with the MYSQL database connectivity
CO 5. Develop a server-side scripting language for web applications

**UNIT I** 15 hours
Introduction and Overview: Lexical Structure –Datatypes–Expressions, Operators, Control Statements and Functions-Operator Precedence –Arithmetic, String Concatenation, Comparison, Bitwise, Logical and Assignment Operators–Flow Control Statements– Try…Catch Statement-Functions.

**UNIT II** 15 hours
Strings:QuotingString Constants–Printing Strings–Cleansing Strings–Comparing Strings–Manipulating and Searching Strings– Arrays: Types of Arrays–Important functions in array –Functions on Complete Arrays– Sorting.

**UNIT III** 15 hours
Objects: Object Oriented Concepts - Classes and Objects in PHP- Declaring Methods – Declaring Properties - Declaring Constants - Inheritance -Abstract Classes - Constructors -Destructors – FormHandling - Processing Forms - Form Validation. Files and Directories – Opening and creating files inPHP – Closing files in PHP – File uploading in PHP – File Downloading in PHP – Reading the contents of a Directory–Deleting the contents of a Directory–CreatingthenewDirectories.

**UNIT IV** 15 hours
Graphics: Creating and drawing images-Basic drawing functions-Using text in Images- Cookies : Need for Cookies–Uses of Cookies – Anatomy of a Cookie– Creating andAccessingCookies in PHP – Deleting Cookies – PHP Sessions – Starting a PHP Session – Storing a Sessionvariable–DestroyingaSession.

**UNIT V** 15 hours
MySQL: Connecting to and disconnecting from the Server – MySQL data types – SHOW and CREATE databases – Creating a table – DESCRIBE,INSERT and SELECT command – DROP tablesanddatabases – Update, Alter and Delete Operations – MySQL access with PHP: Open a connection to theMySQL server – Disconnect a connection from MySQL server – Creating a database using PHP –Selecting MySQL database using PHP–Creating a table using PHP-Insert data into MySQL using PHP-Updating data into MySQL.

**Text Book:**
Hajiram Beevi J, Khairunnisa and Munawara Banu S, *Primer on PHP*, Yazhini Publication,1st Edition,2016.

**UNITI:** Chapter1(1.3,1.4)& Chapter 2 (2.1,2.3-2.10,and2.12)
**UNIT II:** Chapters3&4
**UNIT III:** Chapter10& Chapter 6(6.1,6.2,and6.8–6.11)
**UNIT IV:** Chapters 5,7&11
**UNIT V:** Chapter8(8.1-8.9)& Chapter 9(9.1-9.6)

**Book forReference:**
1. StevenHolzner, *PHP: The Complete Reference*,McGraw Hill Education, 2007

**WebReferences:**
https://www.w3schools.com/php
https://www.tutorialspoint.com/php

**RelationshipMatrix for CourseOutcomes, Programme Outcomesand Programme SpecificOutcomes:**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| VI | 20UIT6CC14 | PHP PROGRAMMING | | 5 | 5 |

| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes(PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |
| CO2 | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Numberofmatches (✓)=40,Relationship:High | | | | | | | | | | |

**Prepared by:**                                             **Checked by:**

S. Munawara Banu                                           Dr. S. Abdul Saleem

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT6CC15 | CORE – XV | CYBER FORENSICS | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Identify various types of cyber-attacks
CO 2. Understand different types of Attacker Techniques and Motivations
CO 3. Understand the various exploitation and malicious codes
CO 4. Analyze the defence techniques suitable for the system
CO 5. Apply the techniques for securing the systems

**UNIT I**                                                           **15 hours**
Cyber Security Fundamentals: Network Security Concepts: Information assurance fundamentals - Basic Cryptography – Encryption - Firewalls. Microsoft Windows Security Principles: Tokens – Messages - Program execution -Firewall.

**UNIT II**                                                          **15 hours**
Attacker Techniques and Motivations: Anti-forensics: Tracks and techniques - Fraud techniques: Phishing –Smishing –Vishing - and Mobile Malicious Code -Rogue Antivirus - Click Fraud - Threat infrastructure.

**UNIT III**                                                      **15 hours**
Exploitation: Shell code - Integer Overflow Vulnerabilities - Format String Vulnerabilities - SQL Injection - Malicious PDF Files -Web Exploit Tools

**UNIT IV**                                                     **15 hours**
Malicious Code: Self-Replicating Malicious Code - Persistent Software Techniques –Rootkits – Spywares - Attacks against Privileged User Accounts and Escalation of Privileges - Stealing Information and Exploitation.

**UNIT V**                                                      **15 hours**
Defence and Analysis Techniques: Memory Forensics –Honeypots - Malicious Code Naming - Automated Malicious Code Analysis Systems - Intrusion Detection Systems

**Text Book:**
James Graham, Richard Howard and Ryan Olson, *Cyber Security Essentials*,CRC Press T&F Group,2011
**UNIT I** : Chapter1   **UNIT II** : Chapter2   **UNIT III** : Chapter3   **UNIT IV** : Chapter4   **UNIT V** : Chapter5

**Book forReference:**
Chwan-Hwa(John) Wu, J.David Irwin, *Introduction to Computer Networks and Cyber Security*, CRC Press T&F Group,2013.

**Web References:**
1. http://www.open.edu/openlearn/futurelearn/cyber-security.
2. http://nptel.ac.in/courses/106105031/40

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| VI | 20UIT6CC15 | CYBER FORENSICS | | 5 | 5 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |
| CO2 | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 40, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                                   **Checked by:**

Mr. K.M. Akbar Badhusha                                                          Dr. S. Abdul Saleem

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| VI | 20UIT6CC16P1 | CORE– XVI(a) | DOCUMENT PROCESS TOOLS LAB-PRACTICAL | 2 | 2 | 50 | 10 | 40 |

## Practical Exercises using Libre Office-Writer

1.  Prepare a resume using text manipulation.

2.  Prepare a simple newspaper format using Insert Drop Cap, Header and Footer, and Wrap Text.

3.  Design a greeting card using Insert image.

4.  Prepare a birthday invitation using Mail Merge

## Practical Exercises using Libre Office-Calc

5.  Usage of Formulae and Built-in Functions.
6.  Prepare a Student Mark sheet with Bar Chart.
7.  Prepare an Invoice Bill.
8.  Prepare an employee Payroll.

## Practical Exercises using Libre Office-Impress

9.  Prepare slides for  Text formatting

10.  Prepare  slides with Shapes, images WordArt and ClipArt

11.  Prepare  slideshow for advertizing a product

12.  Prepare a Slide show with Text and Image animation

**Prepared By :**                                                            **Checked By:**

A. Sumaiya                                                                   Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| VI | 20UIT6CC16P2 | CORE–XVI (b) | PHP PROGRAMMING LAB – PRACTICAL | 3 | 3 | 50 | 10 | 40 |

**Develop PHP programs to**

1. Use the conditional statements (if-else and switch)

2. Prepare a calendar

3. Generate Prime Number Series

4. Manipulate string functions

5. Find the GCD of two numbers using user defined function

6. Use constructors and destructors

7. Design a simple webpage for generating a multiplication table

8. Design a webpage for calculating individual's age

9. Upload and Download files

10. Download a file from server

11. Store the current Date and Time in Cookie and display the last visited time

12. Store page views count in Session

13. Draw a Human face and insert text in it

14. Design a webpage for validating the username and password

**Prepared by:**                                    **Checked by:**

S. Munawara Banu                                    Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| VI | 20UIT6DE2A | Discipline Specific Electives-II | DATA MINING | 5 | 4 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Understand the concept of data warehouse
CO 2. Understand Data Mining concepts and knowledge discovery process
CO 3. Understand the various issues and challenges in Datamining
CO 4. Analyze various data mining algorithms
CO 5. Apply various techniques to solve real time problems

**UNIT I**                                             **15 hours**
Introduction: Data mining as a subject. DATA WAREHOUSING: Introduction-What is a Data Warehouse?-Definition-Multidimensional Data Model-OLAP operations-Warehouse Schema-Data Warehousing Architecture-Warehouse Server-Metadata-OLAP Engine-Data Warehouse Backend Process-Other features.

**UNIT II**                                             **15 hours**
Data Mining: Introduction-What is Data Mining? Data Mining: Definitions- KDD vs Data Mining-DBMS vs DM, Other Related Areas – DM Techniques – Other Mining Problems – Issues and challenges in DM – DM applications areas – DM applications – Case studies - Conclusion

**UNIT III**                                          **15 hours**
Association Rules: Introduction – What is an Association Rule? – Methods to Association Rules – A priori Algorithms – Partition Algorithm – Pincer-Search Algorithm – Dynamic Itemset Counting Algorithm – FP-tree Growth algorithm - Discussion on Different algorithm – Incremental algorithm – Border algorithm – Generalized Association rule – Association Rules with Item Constraints.

**UNIT IV**                                          **15 hours**
Clustering Techniques: Introduction – Clustering Paradigms – Partitioning Algorithms – k-Medoid Algorithms - CLARA – CLARANS – Hierarchical Clustering- DBSCAN – BIRCH – CURE - Categorical Clustering Algorithms – STIRR – ROCK – CACTUS.

**UNIT V**                                            **15 hours**
Decision Trees: Introduction – What is a Decision Tree? – Tree Construction principle – Best Split – Splitting Indices – Splitting Criteria – Decision Tree Construction Algorithms – CART – ID3 – C4.5 – CHAID – Summary – Decision Tree construction with Presorting – RainForest – Approximate methods – CLOUDS – BOAT -  Pruning Technique – Integration of pruning and construction.

**Text Book:**
Arun K Pujari, *Data Mining Techniques*, Universities Press, 2001

**UNIT I:** Chapter 1 & 2                 **UNIT II:** Chapter 3
**UNIT III:** Chapter 4                   **UNIT IV:** Chapter 5
**UNIT V:** Chapter 6

**Books for Reference:**
1. Margaret H. Dunham, *Data Mining, Introductory and Advanced Topics*, Prentice Hall, 2002.
2. Ian H. Witten, Eibe Frank, Mark A. Hall, *Data Mining Practical Machine Learning Tools and Techniques*, Morgan Kaufmann Publishers, Third Edition, 2011.
3. G.K. Gupta, *Introduction to Data Mining with Case Studies*, Prentice Hall of India, 2008.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:**

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| VI | 20UIT6DE2A | DATA MINING | | 5 | 4 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO2 | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO3 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of matches (✓) = 43, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                 **Checked by:**

Dr. S. Vaaheedha Kfatheen                                             Dr. S. Abdul Saleem

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|-----------|----------------|----------------|
| VI | 20UIT6DE3AP | Discipline Specific Electives-III | DATAMINING USING WEKA LAB - PRACTICAL | 4 | 4 | 100 | 20 | 80 |

Develop programs using WEKA Tool to

1. List all the categorical or nominal attributes and real-valued attributes separately.

2. Create an Employee Table

3. Create a Weather Table

4. Mine Association Rule for

      a) E-Commerce Dataset

      b) Banking Dataset

      c) Employee Dataset

5. Perform  Cluster analysis for a Customer Dataset

6. Perform classification and build a Decision Tree for

      a) Weather Dataset

      b) Customer Dataset

      c) Geographical Location Dataset

      d) Iris Dataset

**Prepared by:**                                        **Checked by:**

Dr. S. Vaaheedha Kfatheen                          Dr. S. Abdul Saleem

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT6DE2B | Discipline Specific Electives-II | R PROGRAMMING | 5 | 5 | 100 | 25 | 75 |

**Course Outcomes (COs):**

**On completion of the course, students will be able to**

CO 1. Acquire the basic constructs of R
CO 2. Understand the loading and retrieval techniques of data
CO 3. Understand how data is analyzed and visualized using statistic functions
CO 4. Use R programming in Linear Algebra and Set theory
CO 5. Identify how to interface R with other languages

**UNIT I**                                                                                    **15 hours**

Getting Started: How to Run R - Introduction to Functions - Some important R Data Structures - Vectors: Scalars, Vectors, Arrays and Matrices - Declarations - Common Vector Operations - Vectorized Operations - NA and NULL Values - Filtering - Matrices and Arrays: Creating Matrices - General Matrix Operations - Applying Functions to Matrix Rows and Columns - Adding and Deleting Matrix Rows and Columns - Naming Matrix Rows and Columns - Higher Dimensional Arrays

**UNIT II**                                                                                   **15 hours**

Lists: Creating Lists - General List Operations - Accessing List Components and Values - Applying Functions to Lists - Recursive Lists  - Data Frames: Creating Data Frames - Merging Data Frames - Applying Functions to Data Frames - Factors and Tables: Factors and Levels - Common Functions used with Factors - Working with Tables - Other Factor and Table Related Functions

**UNIT III**                                                                                  **15 hours**

R Programming Structures: Control Statements - Arithmetic and Boolean Operators and Values - Default Values for Arguments - Return Values - No Pointers in R - Writing Your Own Binary Operations -  Anonymous Functions  - Doing Math and Simulations in R: Math Functions - Functions for Statistical Distributions - Sorting - Linear Algebra Operations on Vectors and Matrices - Set Operations - Simulation Programming in R

**UNIT IV**                                                                                   **15 hours**

Object-Oriented Programming: S3 Classes - S4 Classes - S3 Versus S4 - Managing Your Objects - Input/Output: Accessing the Keyboard and Monitor - Reading and Writing Files - Accessing the Internet - String Manipulation: An Overview of String-Manipulation Functions - Regular Expressions

**UNIT V**                                                                                    **15 hours**

Graphics: Creating Graphs - Customizing Graphs - Saving Graphs to Files - Creating Three-Dimensional Plots - Interfacing R to Other Languages: Writing C/C++ Functions to be called from R - Using R from Python

**Text Book:**
Norman Matloff, "*The Art of R Programming A Tour of Statistical Software Design*", No Starch Press, 2011
**UNIT  I**: Chapter 1, 2, 3
**UNIT  II**: Chapter 4, 5, 6
**UNIT III**: Chapter 7, 8
**UNIT IV**: Chapter 9, 10, 11
**UNIT  V**: Chapter 12, 15

**Book for References:**

Garrett Grolemund, "Hands-On Programming with R", O'Reilly, First Edition, 2014, ISBN: 978-1-449-35901-0

**Web References:**

1. https://onlinecourses.nptel.ac.in/noc19_ma33/preview
2. https://www.statmethods.net/r-tutorial/index.html
3. www.r-project.org
4. www.cran.r-project.org
5. https://onlinecourses.nptel.ac.in/noc19_ma33/preview
6. https://www.statmethods.net/r-tutorial/index.html
    .

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

| Semester | Code | Title of the Course | | Hours | Credits |
|---|---|---|---|---|---|
| VI | 20UIT6DE2B | R PROGRAMMING | | 5 | 5 |

| Course Outcomes ( COs ) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO2 | | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| CO4 | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Number of matches (✓) = 37, Relationship: High | | | | | | | | | | |

**Prepared by:**                                                                 **Checked by:**
 Lt. J. Hajiram Beevi                                                          S. Munawara Banu

**Note:**

| Mapping | 1-29% | 30-59% | 60-69% | 70-89% | 90-100% |
|---|---|---|---|---|---|
| Matches | 1-14 | 15-29 | 30-34 | 35-44 | 45-50 |
| Relationship | Very Poor | Poor | Moderate | High | Very High |

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|----------|------|--------|---------------------|-------|---------|------------|----------------|----------------|
| VI | 20UIT6DE3BP | Discipline Specific Elective - III | R PROGRAMMING LAB - PRACTICAL | 4 | 4 | 100 | 20 | 80 |

**Develop R programs to**

1. Read two vectors V1 and V2 containing values (49,21,34,53,11) and (14,49,53,34,81). Find out the values of V1 that are not present in V2 and store it into a new vector without using any predefined function.

2. Create a user defined function that performs the binary search on a numeric vector.

3. Create two 3 X 3 matrices A and B and perform the following operations

   a) Transpose of the matrix     b) addition          c) subtraction

4. Create a data frame that stores some basic information of laptop such as the configuration of laptop from at least five companies. Apply length(), str(), summary(), duplicated(), unique() functions or other functions on the data frame.

5. Create a data frame that stores the temperature of 10 cities along with their names. Using the function rownames(), put suitable names of the rows and columns of the data frame.

6. Create a list that stores some arbitrary numbers as components. Add three new numbers on the list and delete the third and eighth existing numbersin the list.

7. Check whether a year (integer) entered by the user is a leap year or not.

8. Create a recursive function that generates the Fibonacci series.

9. Create two vectors where one vector contains positive values and the other contains negative values. Find the correlation between the two vectors.

10. Get the unique elements of a given string and unique numbers of vector.

11. Illustrate the use of regular expressions.

12. Create a simple bar plot of five subjects' marks.

13. Create a simple pie chart of monthly expenditure.

**Prepared by:**                                                                    **Checked by:**
Lt. J. Hajiram Beevi                                                                   Mr. M.Kamal

| Semester | Code | Course | Title of the Course | Hours | Credits | Max. Marks | Internal Marks | External Marks |
|---|---|---|---|---|---|---|---|---|
| VI | 20UIT6EC2 | Extra Credit Course - II | Information Technology for Competitive Examinations | -- | 4 | 100 | -- | 100 |

**UNIT  I**: Programming in C, C++ and Java

**UNIT  II**: Data Structures and Database Systems

**UNIT III**:  Operating Systems and Computer Networks

**UNIT IV**: Multimedia and Open Source Technologies

**UNIT V**:  Software Engineering

**Prepared by:**                                                      **Checked by:**

Dr. S. Abdul Saleem                                              Dr. S.A. Jameel