B.Sc., INFORMATION TECHNOLOGY

Syllabus

Program Code: UIT

2018 - Onwards

MANNAR THIRUMALAI NAICKER COLLEGE

(AUTONOMOUS)

Re-accredited with "A" Grade by NAAC

PASUMALAI, MADURAI – 625 004

Eligibility for Admission

Candidates should have passed the Higher Secondary Examination with 10+2 pattern conducted by the Board of Higher Secondary Education, Govt. of Tamil Nadu or any other examinations accepted by the Syndicate as equivalent there to and the candidate should have studied +2 level Mathematics in the 10+2 pattern.

Duration of the course

The duration of the course shall be three academic years comprising six semesters with two semesters in each academic year.

Subject of Study

Part I: Tamil
Part II: English
Part III:

1. Core Subjects
2. Allied Subjects
3. Electives

Part IV :

1. Non Major Electives
2. Skill Based Subjects
3. Environmental Studies
4. Value Education

Part V :

Extension activities

The scheme of Examination

The components for continuous internal assessment are:

Two tests and their average	--15 marks
Seminar /Group discussion	--5 marks
Assignment	--5 marks
Total	--25 marks

Pattern of the questions paper for the continuous Internal Assessment

(For Part I, Part II, Part III , NME & Skilled Paper in Part IV)

The components for continuous internal assessment are:

Part –A

Six multiple choice questions (answer all) 6 x01= 06 Marks

Part –B

Two questions (‘either …. Or ‘type) 2 x 07=14 Marks

Part –C

One question out of two 1 x 10 =10 Marks

Total 30 Marks

Pattern of the question paper for the Summative Examinations:

Note: Duration- 3 hours

Part –A

Ten multiple choice questions 10 x01 = 10 Marks

(No Unit shall be omitted; not more than two questions from each unit.)

Part –B

Five Paragraph questions (‘either …. Or ‘type) 5 x 07 = 35 Marks

(One question from each Unit)

Part –C

Three Essay questions out of five 3 x 10 =30 Marks

(One question from each Unit)

Total 75 Marks

The Scheme of Examination (Environmental Studies and Value Education)

Two tests and their average	--15 marks
Project Report	--10 marks*
Total	--25 marks

** The students as Individual or Group must visit a local area to document environmental assets – river / forest / grassland / hill / mountain – visit a local polluted site – urban / rural / industrial / agricultural – study of common plants, insects, birds – study of simple ecosystem – pond, river, hill slopes, etc.

Question Paper Pattern

Pattern of the Question Paper for Environmental Studies & Value Education only) (Internal)

Part –A

(Answer is not less than 150 words)

Four questions (‘either …. Or ‘type) 4 x 05=20 Marks

Part –B

(Answer is not less than 400 words)

One question (‘either …. Or ‘type) 1 x 10=10 Marks

Total 30 Marks

Pattern of the Question Paper for Environmental Studies & Value Education only) (External)

Part –A

(Answer is not less than 150 words)

Five questions (either or type) 5 x 06 =30 Marks

(One question from each Unit)

Part –B

(Answer is not less than 400 words)

Three questions out of Five 3 x 15 = 45 Marks
each unit (One question from each Unit)

Total 75 Marks

Minimum Marks for a Pass

40% of the aggregate (Internal +Summative Examinations).

No separate pass minimum for the Internal Examinations.

27 marks out of 75 is the pass minimum for the Summative Examinations.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To empower students with high level attainment in professional career and higher education by accruing knowledge of computation, mathematics and pursue higher studies.

PEO2: To equip students with profound knowledge about the vital information technology to deal with industry oriented problems and develop novel products.

PEO3: Graduates will have excellent communication skills, excel in multi-disciplinary and multi-cultural teams, and have an appreciation for non-technical disciplines.

PEO4: To inculcate professional-social ethics, team work in students and acquaint them with requisite technical and managerial skills to attain a successful career.

PROGRAM OUTCOMES

PO1: Apply the knowledge of mathematics, science, computational fundamentals, and specialization for the solution of complex IT problems.

PO2: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO3: Identify, formulate, review research literature, and analyze complex problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences.

PO4: Create, select, and apply appropriate techniques, resources, and modern IT tools, including prediction and modeling to complex computing activities, with an understanding of the limitations.

PO5: Apply ethical principles and commit to professional ethics and responsibilities.

PO6: Demonstrate knowledge and understanding of the management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO7: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

PSO1: To solve organization problems, individually and or in teams, using quantitative, Qualitative and technology enhance approaches.

PSO2: To illustrate the flowchart and design an algorithm for a given problem and to develop IC programs using operators

PSO3: To read, understand and trace the execution of programs written in C language. Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.

PSO4: To demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.) . Develop a Graphical User Interface (GUI) based on problem description.

DEPARTMENT OF B.Sc (INFORMATION TECHNOLOGY)
(For those who joined in 2018-2019 and after)
COURSE PATTERN

Study Component	Title	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Total Hours	Total Credits	No.of Courses	Total Marks
Part - I	**Tamil**	6(3)	6(3)	6(3)	6(3)	-	-	24	12	4	400
Part - II	**English**	6(3)	6(3)	6(3)	6(3)	-	-	24	12	4	400
Part - III	**Core Courses**	4(4) 6(4)	4(4) 6(4)	5(5) 5(5)	5(4) 5(5)	6(4) 6(5) 6(5)	6(4) 6(5)	70	58	13	1300
	Core Project						6(5)	6	5	1	100
	Allied Courses	4(4)	4(4)	4(4)	4(4)	-	-	16	16	4	400
	Optional Courses Elective	-	-	-	-	5(4) 5(4)	5(4) 5(4)	20	16	4	400
Part - IV	**Skill Based Subject**	2(2)	2(2)	2(2)	2(2)	2(2)	2(2)	12	12	6	600
	NME	-	-	2(2)	2(2)	-	-	4	4	2	200
	VE/ EVS	2(2)	2(2)	-	-	-	-	4	4	2	200
Part - V	**Extension Activities**	-	-	-	0(1)	-	-	-	1	1	100
Total		**30(22)**	**30(22)**	**30(24)**	**30(24)**	**30(24)**	**30(24)**	**180**	**140**	**41**	**4100**

SEMESTER – I

Subject Code	Title of the Paper	No. Of Courses	Hrs / Week	Credits	Maximum Marks		
					INT.	EXT.	TOT
18UTAG11	**பகுதி-Iதமிழ்** **தற்கால கவிதையும் உரைநடையும்**	1	6	3	25	75	100
18UENG11	English-I: Exploring Language Through Literature-1	1	6	3	25	75	100
18UITC11	**Part III: Core Subject** Principles of Information Technology	1	4	4	25	75	100
18UITCP1	Office Automation – Lab	1	6	4	40	60	100
18UITA11	**Part III: AlliedSubject** Discrete Mathematics	1	4	4	25	75	100
18UITSP1	**Part IV : Skill Subject** Multimedia – Lab	1	2	2	40	60	100
18UEVG11	**Part IV : Mandatory** Environmental Studies	1	2	2	25	75	100
	Total	7	30	22	205	495	700

SEMESTER – II

Subject Code	Title of the Paper	No. Of Courses	Hrs / Week	Credits	Maximum Marks		
					INT.	EXT.	TOT
18UTAG21	பகுதி-I தமிழ் பக்தி இலக்கியமும் நாடகமும்	1	6	3	25	75	100
18UENG21	English-II: Exploring Language Through Literature-II	1	6	3	25	75	100
18UITC21	**Part III: Core Subject** Programming in C	1	4	4	25	75	100
18UITCP2	Programming in C –Lab	1	6	4	40	60	100
18UITA21	**Part III: Allied Subject** Statistical and Numerical Methods	1	4	4	25	75	100
18UITSP2	**Part IV : Skill Subject** Visual Programming-Lab	1	2	2	40	60	100
18UVLG21	**Part IV : Mandatory** Value Education	1	2	2	25	75	100
	Total	**7**	**30**	**22**	**205**	**495**	**700**

SEMESTER – III							
Subject Code	**Subjects**	**No. of Courses**	**Hrs / Week**	**Credits**	**Maximum Marks**		
					INT.	**EXT.**	**TOT**
18UTAG31	**Part I :Tamil** காப்பிய இலக்கியமும் நாடகமும்	1	6	3	25	75	100
18UENG31	**Part II: English** Exploring Language Through Literature-III	1	6	3	25	75	100
	Part III: Core Subject						
18UITC31	Data Structures and C++ Programming	1	5	5	25	75	100
18UITCP3	Data Structures Using C++ - Lab	1	5	5	40	60	100
18UITA31	**Part III: Allied Subject** Operations Research	1	4	4	25	75	100
	Part IV :Skill Subject						
18UITSP3	Web Technology - Lab	1	2	2	40	60	100
18UITN31	**Part IV: Non Major Elective** PC Software - Lab	1	2	2	40	60	100
	Total	**7**	**30**	**24**	**220**	**480**	**700**

SEMESTER – IV							
Subject Code	**Title of the Paper**	**No. Of Courses**	**Hrs / Week**	**Credits**	**Maximum Marks**		
					INT.	**EXT.**	**TOT**
18UTAG41	**Part I : Tamil** சங்க இலக்கியமும் உரைநடையும்	1	6	3	25	75	100
18UENG41	**Part II : English** Exploring Language Through Literature-IV	1	6	3	25	75	100
	Part III: Core Subject						
18UITC41	Java Programming	1	5	4	25	75	100
18UITCP4	Java Programming - Lab	1	5	5	40	60	100
18UITA41	**Part III: Allied Subject** Digital Principles and Applications	1	4	4	25	75	100
	Part IV :Skill Subject						
18UITSP4	PHP with MYSQL - Lab	1	2	2	40	60	100
18UITN41	**Part IV: Non-Major Elective** HTML Programming-Lab	1	2	2	40	60	100
18UEAG40-18UEAG49	**Part V : Extension Activities**	1	0	1	-	100	100
	Total	**8**	**30**	**24**	**220**	**580**	**800**

SEMESTER – V

Subject Code	Title of the Paper	No. Of Courses	Hrs / Week	Credits	Maximum Marks		
					INT.	EXT.	TOT
18UITC51	**Part III: Core Subject** Relational Database Management System	1	6	4	25	75	100
18UITCP5	Relational Database Management System – Lab	1	6	5	40	60	100
18UITC52	Operating System	1	6	5	25	75	100
18UITE51 18UITE52 18UITE53	**Part III:** **Elective Subject** 1.Computer Networks 2.Biometrics 3. System Software	1	5	4	25	75	100
18UITE54 18UITE55 18UITE56	**Part III:** **Elective Subject** 1.Cryptography and Network Security 2.Software Engineering 3.Object Oriented Analysis and Design	1	5	4	25	75	100
18UITSP5	**Part IV: Skill Subject** Android Programming – Lab	1	2	2	40	60	100
	Total	**6**	**30**	**24**	**180**	**420**	**600**

SEMESTER – VI

Subject Code	Title of the Paper	No. Of Courses	Hrs / Week	Credits	Maximum Marks		
					INT.	EXT.	TOT
18UITC61	**Part III: Core Subject** .Net Programming	1	6	4	25	75	100
18UITCP7	.Net Programming Lab	1	6	5	40	60	100
18UITPR1	Project and Viva – voce	1	6	5	40	60	100
18UITE61 18UITE62 18UITE63	**Part III:** **Elective Subject** 1.E-Commerce 2.Mobile Computing 3.Artificial Intelligence	1	5	4	25	75	100
18UITE64 18UITE65 18UITE66	**Part III:** **Elective Subject** 1.Data Mining and Warehousing 2.Cloud Computing 3.Internet of Things	1	5	4	25	75	100
18UITS61	**Part IV :Skill Subject** Numerical Aptitude	1	2	2	25	75	100
	Total	6	30	24	180	420	600


FIRST SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc (IT)**	**Part III**	**: Core**
Semester	**: I**	**Hours**	**: 04**
Sub. Code	**: 18UITC11**	**Credits**	**: 04**

PRINCIPLES OF INFORMATION TECHNOLOGY

Course Outcomes:

CO1: Students can have the ability to use facts, concepts, principles and procedures in unfamiliar situations.

CO2: They can identify and recognize the relationships between the various components of Information Technology and their impact on society.

CO3: Students can recognize the limitations and assumptions of data gathered in an attempt to solve a problem.

CO4: Student understands the basic knowledge of the computer.

UNIT – I:

Introduction to Computer Systems: Introduction to Computers – Five Generations of Modern Computers – Classification of Digital Computer Systems– Anatomy of a Digital Computer-Central Processing Unit and Memory Units –Input Devices- Output Devices.

UNIT – II:

Computer Software & Software Development: Introduction to Computer Software – Introduction to Software Development –Programming Languages- Operating Systems.

UNIT – III:

Telecommunications: Introduction to Telecommunications – Computer Networks - Communications Systems- Distributed Data Processing. **Internet & Intranets:** Internet & World Wide Web – Overview of Electronic Mail- Introduction to Intranets – Introduction to E-Commerce and E-Business.

UNIT – IV:

Security: Introduction to Computer Security – Cryptography – Computer Viruses, Bombs and Worms. **Multimedia & Virtual Reality:** Introduction to Multimedia – Multimedia and Applications – Introduction to Virtual Reality.

UNIT – V:

Applications of Information Technology: Computers in Business and Industry –Computers at Home-Computers in Education in Training-Computers in Entertainment, Science, Medicine and Engineering- Mobile Computing and Business on the Internet.

TEXT BOOK:

1. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, 2nd Edition, L and L Consultancy Services Pvt. Ltd., New Delhi, 1999.

UNIT – I:

Chapters:1 to 4, 7,9,10

UNIT – II:

Chapters: 11 to 14

UNIT – III:

Chapters: 20 to 27

UNIT – IV:

Chapters: 30 to 35

UNIT – V:

Chapters: 45 to 49

REFERENCE:

1. James A.O'Brien, Management Information System, 4th Edition, TATA McGraw–Hill, New Delhi, 1999.
2. C.Xavier, **World Wide Web Design with HTML**, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2000.
3. Kathleen M. Austin and Lorraine N. Bergkvist, Principles of Information Technology, 1st edition,Goodheart-Wilcox Publisher,2015.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme	**: B.Sc (IT)**	**Part III**	**: Core**
Semester	**: I**	**Hours**	**: 06**
Sub Code	**: 18UITCP1**	**Credits**	**:04**

OFFICE AUTOMATION – LAB

Course Outcomes:

CO1: Recognize when to use each of the Microsoft Office programs to create professional and academic documents.

CO2: Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.

CO3: Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace.

CO4: Students can get the knowledge about the document maintenance and presentation which will be used in their companies or offices.

MICROSOFT WORD

1. Document using header , footer and border.
2. Insert Picture To Create Invitation
3. Mail Merge
4. Table Manipulation
5. To Create A College Application Form
6. Welcome Message Using Macros
7. Addition Operation Using Macros
8. Multiplication Operation Using Macros

MICROSOFT EXCEL

1. Student Mark Details With Chart
2. Electricity Bill Preparation
3. Company Budget Using Ms Excel
4. Multiple Worksheet

MICROSOFT POWERPOINT

1. Blank slide Preparation
2. Templates Presentation
3. Animation Of Cars

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme	**: B.Sc. (IT)**	**Part IV**	**: Allied**
Semester	**: I**	**Hours**	**: 04**
Sub Code	**: 18UITA11**	**Credits**	**: 04**

DISCRETE MATHEMATICS

CourseOutcomes:

CO1: To train the students with fundamental concepts of mathematics

CO2: To inculcate the essential mathematical concepts for computer applications.

CO3: To equip the students with logical thinking and analytical thinking on algebraic structures, graph theory with examples.

CO4: This course enable the students to use the problem solving skills in a wide variety of situations.

UNIT I

Set theory–Introduction – Sets – Venn - Euler diagrams – Operations on Sets –Verification of basic laws of algebra by Venn diagram – Principle of Duality.

Relations – Cartesian Product of Two Sets - Relations – Representation of Relations - Operation on relations – Equivalence relation – Closure and Warshall's Algorithm.

UNIT II

Functions - Functions and operators – One -To– One, Onto functions – Special type of functions – Invertible functions – Composition of functions

Mathematical Induction: Techniques of Proof – Mathematical Induction

UNIT III :Logic

Introduction – TF – Statements - Connectives – The Truth table of a Formula – Tautology – Tautological implications and equivalence of formulae.

UNIT IV :Matrix Algebra

Introduction – Operations – Inverse of a Square Matrix, Elementary Operations and Rank of matrix –Simultaneous linear equations – Eigen values & Eigen vectors.

UNIT V: Graph Theory:

Introduction – Definitions and examples – Degrees – Sub graphs- Trees: Introduction – Characterization of Trees – Centre of a Tree – Some Applications: Introduction – Connector problem – Shortest path problem.

Text Books:

1. M.Venkatraman, N.Sridharan and N.Chandrasekaran, **Discrete Mathematics,** The National Publishing Company, Chennai, Reprint, 2006.
2. S.Arumugam, S.Ramachandran, **Invitation toGraph Theory**, Scitech Publications India Pvt Ltd, Chennai, Reprint 2006.

Unit I : Book 1	Chapter: 1	Sections: 1.1, 1.2, 1.5, 1.6, 1.8, 1.9
	Chapter: 2	Sections: 2.1 to 2.6
Unit II : Book 1	Chapter: 3	Sections: 3.1 to 3.4
	Chapter: 4	Sections: 4.1, 4.2
Unit III: Book 1	Chapter: 9	Sections: 9.1 to 9.3, 9.6 to 9.8.
Unit IV: Book 1	Chapter: 6.	Sections: 6.1 to 6.5, 6.7
Unit V : Book 2:	Chapter: 2	Sections 2.0 to 2.3.
	Chapter: 6	Sections 6.0 to 6.2.
	Chapter: 11	Sections 11.0 to 11.2.

REFERENCE BOOKS

1. SeymourLipchitz,**Discrete Mathematics,** Marc Lipson(Schaum's Outline Series)-Second Edition.
2. Dr S Arumugam&Issac SciTech, **Modern Algebra ,** Publishers (for Units 1,2,4).
3. T.VeeraRajan, **Discrete Mathematics with Graph Theory and Combinations,** Tata McGraw Hill Publishing Company Ltd.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme	**: B.Sc (IT)**	**Part IV**	**: Skill**
Semester	**: I**	**Hours**	**: 02**
Subject Code	**:18UITSP1**	**Credits**	**: 02**

MULTIMEDIA LAB

CourseOutcomes:

CO1: To understand the basic usage of flash
CO2: To understand the masking in flash
CO3: To understand about the Photoshop
CO4: provides employability for students in animation field.

Using flash:

1. Text masking using flash

2. Text blur using flash

3. Photo masking using flash.

4. Animation frame by frame using flash

5. Vector drawing using flash

6. Rotating ball using button using flash

7. Bouncing ball using flash

8. Four functions calculator using flash

Using Photoshop:

1. Radiation effect using Photoshop
2. 3D text using Photoshop
3. Glow effect using Photoshop
4. Realistic clouds using Photoshop
5. Digital background using Photoshop

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme	**: B.Sc (IT)**	**Part IV**	**: Mandatory**
Semester	**: I**	**Hours**	**: 02**
Subject Code	**:18UEVG11**	**Credits**	**: 02**

ENVIRONMENTAL STUDIES

COURSE OUTCOMES

CO1: To gain knowledge on the importance of environmental education and ecosystem.

CO2: To acquire knowledge about environmental pollution- sources, effects and control measuresof environmental pollution

CO3:To understand the various energy sources, exploitation and need of alternate energy resources. Disaster management To acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence

CO4: To make the student to understand the various pollution problems control mechanisms.

UNIT I	:	**Environment and Earth:** Environment – Meaning – Definition - Components of Environment – Types of Environment. Interference of man with the Environment. Need for Environmental Education. Earth – Formation and Evolution of Earth– Structure of Earth and its components – Atmosphere, Lithosphere, Hydrosphere and Biosphere. **Natural Resources:** Renewable Resources and Non-Renewable Resources. Natural Resources and Associated Problems. Use and Exploitation of Forest, Water, Mineral, Food, Land and Energy Resources.
UNIT II	:	**Ecology and Ecosystems:** Ecology – Meaning - Definition – Scope – Objectives – Subdivisions of Ecology. **Ecosystem**–Concept - Structure - Functions – Energy Flow – Food Chain and Food Web – Examples of Ecosystems (Forest, Grassland, Desert, Aquatic).
UNIT III	:	**Biodiversity:** Definition – Biodiversity at Global, National and Local Level. Values of Biodiversity – Threats to Biodiversity – Conservation of Biodiversity. **Biodiversity of India:**Biogeographical Distribution – Hotspots of Indian Biodiversity – National Biodiversity Conservation Board and Its functions. Endangered and Endemic Species of India
UNIT IV	:	**Pollution Issues:** Definition – Causes – Effects and Control Measures of Air, Water, Soil, Marine, Noise, Thermal and Nuclear Pollutions. **Global Issues:** Global Warming and Ozone Layer Depletion. Future plans of Global Environmental Protection Organisations.
UNIT V	:	**Sustainable Development:**Key aspects of Sustainable Development – Strategies for Sustainable Development - Agriculture – Organic farming – Irrigation – Water Harvesting – Water Recycling – Cyber Waste and Management. **Disaster Management:**Meaning – Types of Disasters - Flood and Drought – Earth quake and Tsunami – Landslides and Avalanches – Cyclones and Hurricanes – Preventions and Consequences. Management of Disasters -

Text Book:

Study Material for **Environmental Studies**, Mannar Thirumalai Naicker College, Pasumalai, Madurai – 625 004.

Reference Books:

1. Study Material for **Environmental Studies**, Publications Division, Madurai Kamaraj University, Madurai – 625 021.
2. R.C. Sharma and Gurbir Sangha,**Environmental Studies**, Kalyani Publishers, 1, Mahalakshmi Street, T.Nagar, Chennai – 600 017.
3. Radha,**Environmental Studiesfor Undergraduate Courses of all Branches of Higher Education, (Based on UGC Syllabus),** Prasanna Publishers & Distributors, Old No. 20, Krishnappa Street, (Near Santhosh Mahal), Chepak, Chennai – 600 005.
4. S.N.Tripathy and Sunakar Panda,**Fundamentals of Environmental Studies**, Vrinda Publications (P) Ltd. B-5, Ashish Complex, (opp. To Ahicon Public School), MayurVihar, Phase-1, Delhi– 110 091.
5. G.Rajah,**Environmental Studies** for All UG Courses, (Based on UGC Syllabus), Margham Publications, 24, Rameswaram Road, T.Nagar, Chennai – 600 017.


SECOND SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc (IT)**	**Part III**	**: Core**
Semester	**: II**	**Hours**	**:04**
Sub.Code	**: 18UITC21**	**Credits**	**: 04**

PROGRAMMING IN C

Course Outcomes:

CO1: To understand and apply advanced programming concepts.

CO2: To understand the concept like pointers, structures, files and link list.

CO3: To exercise user defined functions to solve real time problems.
CO4: To develop programming skills for students.

UNIT I:

Overview of C: History of C – Importance of C – Basic Structure of C Programs – Programming Style – **Constants, Variables and Data Types:** Character Set – C Tokens – Keywords and Identifiers – Constants - Variables - Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data – **Operators and Expressions:** Arithmetic Operators- Relational Operators- Logical Operators- Assignment operators – Increment and Decrement Operators- Conditional Operators -Bitwise Operators- Special Operators – Arithmetic Expressions- Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical functions.

UNIT II:

Managing Input and Output Operations: Introduction-Reading a Character-Writing a Character – Formatted Input – Formatted Output – **Decision Making and Branching:**Introduction- Decision making with If Statement–Simple if Statement – The If…..Else statement - Nesting of If…. Else Statements –The Else If Ladder – The Switch statement – The ?: Operator –The Goto Statement – **Decision Making and Looping:**Introduction -The While Statement – The do Statement – The for statement – Jumps in Loops.

UNIT III:

Arrays: Introduction- One-Dimensional Arrays – Declaration of One-Dimensional Arrays, Initialization of One-Dimensional Arrays – Two-Dimensional Arrays – Initializing Two-Dimensional Arrays - Multi-Dimensional Arrays – Dynamic Arrays - **Character Arrays and Strings:** Introduction- Declaring and Initializing String Variables – Reading Strings from Terminal - Writing Strings to Screen – String Handling Functions.

UNIT IV:

User-Defined Functions: Introduction- Need for User-Defined Functions– A Multi-function program – Elements of User-Defined Functions –Definition of Functions – Return Values and Their Types – Function Calls – Function Declaration– Category of Functions – No Arguments and No Return Values –Arguments but No Return Values - Arguments with Return Values –No Arguments but Returns a Value –Functions that Return Multiple Value - Nesting of Functions – Recursion – Passing Arrays to Functions - Passing Strings to Functions – The Scope, Visibility and Lifetime of Variables -**Structures and Unions:** Introduction- Defining a Structure– Declaring Structure variables – Accessing Structure Members – Structure Initialization – Copying and Comparing Structure Variables – Operations on Individual Members – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields.

UNIT V:

Pointers: Introduction –Understanding Pointers-Accessing the Address of a Variable – Declaring Pointer Variables - Initialization of Pointer Variables – Accessing a Variable through its Pointer – Chain of Pointers – Pointer Increments and Scale Factors – Pointers and Character Strings – Pointers as Function Arguments – Pointers and Structures. **File Management in C:**Introduction – Defining and Opening a File - Closing a File – Input / Output Operations on Files – Error Handling During I/O Operations – Command Line Arguments.

Text Book:

Programming in ANSI C, E.Balagurusamy, 6th Edition, Tata McGraw Hill Publishing Company, 2012.

Unit I: Chapter 1 (Except 1.3-1.7, 1.10-1.12),

Chapter 2 (Except 2.9, 2.13),

Chapter 3 (Except 3.13)

Unit II: Chapters 4 – 6

Unit III: Chapter 7,

Chapter 8 (Except 8.5, 8.6, 8.7, 8.9, 8.10)

Unit IV: Chapter 9 (Except 9.20),

Chapter 10

Unit V: Chapter 11 (Except 11.8, 11.10, 11.12, 11.14, 11.15, 11.17),

Chapter 12 (Except 12.6)

Reference Books:

1. Programming with C,Schaum's Outline Series, Gottfried, Tata McGraw Hill, 2006

2. Programming with ANSI and Turbo C ,Ashok N.Kamthane , Pearson Education, 2006

3. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.

4. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

5. WEBSITE **:**https://www.spoken-tutorial.org

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc. (IT)**	**Part III**	**: Core**
Semester	**: II**	**Hours**	**: 06**
Sub Code	**:18UITCP2**	**Credits**	**: 04**

PROGRAMMING IN C – LAB

CourseOutcomes:

CO1: To understand the basic structure of the C-Programming, declaration and usage of variables.
CO2: To exercise conditional and iterative statements to write C programs.
CO3: To implement file operations in C programming for a given application.
CO4: Students will be able to get an in-depth knowledge in programming and technical skills.

1. Display the current date and time
2. Find the biggest number
3. Check for voting age
4. Student marks details
5. Perform Arithmetic operations
6. Display the Multidimensional array
7. Perform Matrix multiplication
8. Display Prime Numbers between 1 to 100
9. Perform Armstrong number checking
10. Find Factorial number
11. Display the Fibonacci series
12. Convert Decimal to binary
13. Perform sum of sine series
14. Perform sum of exponential series
15. Display the reverse of given number
16. Perform String handling functions
17. Check the Positive, negative and zero
18. Perform Swapping using pointer
19. Perform Sorting using structure
20. Display Floyds triangle
21. Merging the numbers
22. Display Pascal triangle
23. Identifying Vowels using file concept

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme : B.Sc (IT) **Part III : Allied**
Semester : II **Hours : 04**
Subject Code :18UITA21 **Credits : 04**

STATISTICAL AND NUMERICAL METHODS

Course Outcomes:

CO1:To make the students understand the Statistical and Numerical Methods concepts.

CO2:To design and conduct experiments as well as to analyze and interpret data.

CO3:To Identify formulate and solve the problems.

CO4: This course enable the students to use the problem solving skills in a wide variety of situations.

Unit- I

Measures of averages - Measures of dispersion – Skewness based on moments

Unit – II

Correlation and regression- Rank correlation coefficient.

Unit – III

Index numbersandCurvefitting (all types of curves)

Unit - IV

Errors in Numerical Computation – Iteration method – Bisection method – Regulafalsi method – Newton Raphson method.

Unit - V

Interpolation: Newton's Interpolation formulae – Central Difference Interpolation formulae(Gauss forward and backward formulae only) – Lagrange's Interpolation formula – Inverse Interpolation.

Textbook:

1. Dr.S.Arumugam& Isaac, **Statistics**, New Gamma Publications, Reprint 2012.

2.S.Arumugamand A.ThangaPandi Isaac, A.SomaSundaram, **Numerical Methods**, Scitech Publication, Third Edition, 2007.

Unit I: Chapters 2, 3, 4

Unit II: Chapter 6

Unit III: Chapters 5 and 9

Unit IV: Chapter 3 – Section 3.1 – 3.5.

Unit V: Chapter 7 – Section 7.1, 7.2, 7.3, 7.6.

Reference Books:

1. S.C. Gupta,V.K.Kapoor, **Elements of Mathematical Statistics,** Sultan Chand & Sons Publications, New Delhi, 2001.
2. T.Veerarajan and T.Ramachandran, **Numerical Methods,** Tata McGraw Hill, Second Edition, New Delhi, 2006.
3. S.S.Sastry, **Introductory Methods of Numerical Analysis**, Prentice Hall India Private Limited, Fourth Edition, New Delhi, 2008.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc (IT)**	**Part IV**	**: Skill**
Semester	**: II**	**Hours**	**: 02**
Sub. Code	**: 18UITSP2**	**Credits**	**: 02**

VISUAL PROGRAMMING – LAB

CourseOutcomes:
CO1: To design, create, build, and debug Visual Basic applications.
CO2: To explore Visual Basic's Integrated Development Environment (IDE).
CO3: To write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
CO4: It helps to get knowledge about the windows based application.
CO5: It provides the employability for the students in an IT company.

List of Programs:

1. Adam number
2. Add or Remove number
3. Arithmetic operation
4. Armstrong number
5. Ascending & Descending order
6. Average number
7. Car animation
8. Circle using random method
9. Count a number of digits
10. Currency exchange value
11. Display time & date
12. Factorial value
13. Fibonacci series
14. Generate the colors
15. Maximum of value
16. Multiplication table
17. Pass by reference
18. Pass by value
19. Positive, negative or zero
20. Prime number

21. Program using select case
22. Rectangle using random method
23. Reverse the given number
24. Simple interest
25. String function
26. Sum of columns
27. Sum of rows
28. Swapping the number
29. Types of lines

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc (IT)**	**Part IV**	**: Mandatory**
Semester	**: II**	**Hours**	**: 02**
Sub. Code	**: 18UVLG21**	**Credits**	**: 02**

VALUE EDUCATION

COURSE OUTCOMES		
CO1: Clarifying the meaning and concept of value - value education. **CO2**: To inspire **students** to develop their personality and social **values** based on the principles of human **values.** **CO3:** Developing sense of Love, Peace and Brotherhood at Local, national and international levels. **CO4**:To enable the students to understand the social realities and to inculcate an essential value system towards building a health society		
UNIT I	**:**	**Values and The Individual:** Values – Meaning – Definition – Importance – Classification of Values, Value Education – Meaning – Need for Value Education. Values and the Individual – Self-Discipline – Meaning – Tips to Improve Self-Discipline. Self-Confidence – Meaning - Tips to Improve Self-Confidence. Empathy – Meaning – Role of Empathy in motivating Values. Compassion – Role of Compassion in motivating Values. Forgiveness – Meaning - Role of Forgiveness in motivating Values. Honesty – Meaning – Role of Honesty in motivating Values. Courage – Meaning – Role of Courage in motivating Values.
UNIT II	**:**	**Religions and Communal Harmony:** Religions – Meaning **–** Major Religions in India - Hinduism – Values in Hinduism. Christianity – Values in Christianity. Islam – Values in Islam. Buddhism – Values in Buddhism. Jainism – Values in Jainism. Sikhism – Values in Sikhism. Need for Religious Harmony in India. Caste System in India – Need for Communal Harmony in India. Social Justice – Meaning – Factors Responsible for Social Justice.
UNIT III	**:**	**Society and Social Issues:** Society – Meaning – Values in Indian Society. Democracy – Meaning – Values in Indian Democracy. Secularism – Meaning – Values in Indian Secularism. Socialism – meaning – Values in Socialism. Social Issues – Alcoholism – Drugs – Poverty – Unemployment.

UNIT IV	:	**Human Rights and Marginalised People:** Human Rights – Meaning – Problem of Violation of Human Rights in India – Authorities available under the Protection of Human Rights Act in India. Marginalised People like Women, Children, Dalits, Minorities, Physically Challenged – Concept – Rights – Challenges. Transgender – Meaning – Issues.
UNIT V	:	**Social Institutions in Value Formation:** Social Institutions – Meaning – Important Social Institutions. Family – Meaning – Role of Families in Value Formation. Role of Press & Mass Media in Value Formation – Role of Social Activists – Meaning Contribution to Society – Challenges.

Text Book:

Text Module for **Value Education**, Mannar Thirumalai Naicker College, Pasumalai, Madurai – 625 004

Reference Books:

1. Text Module for **Value Education**, Publications Division, Madurai Kamaraj University, Madurai – 625 021.
2. N.S.Raghunathan, **Value Education**, Margham Publications, 24, Rameswaram Road, T.Ngar, Chennai – 600 017.
3. Dr.P.Saravanan, and P.Andichamy, **Value Education**, Merit India Publications, (Educational Publishers), 5, Pudumandapam, Madurai-625001.


THIRD SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part III**	**: Core**
Semester	**: III**	**Hours per week**	**: 05**
Sub. Code.	**: 18UITC31**	**Credit**	**: 05**

DATA STRUCTURES AND C++ PROGRAMMING

Course Outcomes:

CO1: To know the concepts of object oriented programming.
CO2: To understand the abstract data types stack, queue, dequeue and list.
CO3: To be able to implement the ADTs stack, queue, and dequeue using C++.
CO4: To understand the performance of the implementations of basic linear data structures.

Unit-I Basic concepts of Object Oriented Programming

Object Oriented Programming - Benefits of OOP's - Application of OOP - Structure of C++ program - Control statements, inline function, function overloading - specifying a class - defining member function - nesting of member function-array of object - friend function-constructor-parameterized constructor-copy constructor-destructor.

Unit-II Operator overloading, Inheritance and Polymorphism

Defining operator overloading-overloading unary operator-overloading binary operator -rules for operator overloading - single inheritance-multilevel inheritance - multiple inheritance - hierarchical inheritance-hybrid inheritance - virtual base class-pointer - pointer to object - this pointer - polymorphism-virtual function - pure virtual function

Unit –III Arrays, Searching and Sorting

Arrays - Introduction – Linear Arrays – Representation of Linear arrays in memory – Traversing linear arrays – Inserting and Deleting – Linear Search – Binary Search – Multidimensional Array – Pointers – Records – Representation of records in memory - Matrices – Sparse Matrices– Insertion Sort – Selection Sort.

Unit-IV Linked list, Stacks and Queues

Linked List – Introduction – representation of linked list in memory – Traversing a linked list – searching a linked list – memory allocation – insertion and deletion in a linked list – Stacks – Array Representation of Stacks -Linked Representation of Stacks – Quicksort, an application of stack – Recursion – Queues – Linked representation of queues

Unit –V Trees

Introduction – Binary Trees – Representing Binary Trees in Memory – Traversing Binary Tree – Binary Search trees – Searching and Inserting in Binary Search trees.

Text Books:

1. Balagurusamy.E, **Object Oriented Programming with C++,** Tata McGraw Hill, Seventh Edition, 2018, New Delhi.
   - Unit I - Chapter 1 – Section : 1. 5, 1. 6, 1. 8
     Chapter 2 – Section : 2. 6
     Chapter 3 – Section :3.25
     Chapter 4 – Section : 4.6, 4.10
     Chapter 5 – Section : 5.3,5.4, 5.7, 5. 13,5.15
     Chapter 6 – Section : 6 2,6.3, 6.7,6.11
   - Unit II - Chapter 7 – Section : 7.2,7.3,7.4,7.8
     Chapter 8 – Section : 8.3, 8.5 to 8.9
     Chapter 9 – Section : 9.2 to 9.5, 9.7,9.8

2. Pai. G. A. V, Seymour Lipschutz, **Data Structures,** Tata McGraw Hill, 2nd Edition, 2006, New Delhi.
   - Unit III – Chapter 4 (Full), Chapter 9 – Section: 9.3,9.4
   - Unit IV – Chapter 5 – Section : 5. 1 to 5. 8
     Chapter 6 – Section : 6. 2 to 6.4, 6. 6, 6.7, 6.10, 6.11
   - Unit V – Chapter 7 – Section : 7.1, 7. 2, 7.3, 7.4, 7.7, 7.8

Reference Books:

1. Chitra. A, Rajan.P.T**, Classical Data Structures,** Vijay Nicole Imprints**,** 1st Edition, 2006.
2. Samanta.D, **Classical Data Structures,** PHI Learning Private Limited, 2nd Edition, 2008, New Delhi.
3. Poornachandra Sarang, **Object-Oriented Programming With C++,** PHI Learning Private Limited, 2nd Edition, 2009, New Delhi.
4. Alok Kumar Jagadev, Amiya Kumar Rath and Satchidananda Dehuri, **Object-Oriented Programming Using C++,** Prentice-Hall of India Private Limited, 2007, New Delhi.

Reference Websites:

1. www.cplusplus.com/doc/tutorial/
2. www.tutorialspoint.com/cplusplus/
3. www.tutorialspoint.com/data_structures_algorithms/
4. www.studytonight.com/data-structures/

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part III**	**: Core**
Semester	**: III**	**Hours per week**	**: 05**
Sub. Code.	**: 18UITCP3**	**Credit**	**: 05**

DATA STRUCTURES USING C++ - LAB

Course Outcomes:

CO1: To develop knowledge of basic data structures for storage and retrieval of ordered or unordered data.

CO2: To develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.

CO3: Demonstrate a familiarity with major algorithms and data structures.

CO4: Understand how to apply the major object-oriented concepts to implement object oriented programs in C++.

List of Programs:

1. To perform Area calculation using Function overloading (Min three functions).
2. To perform String manipulation (three different types) using function overloading.
3. To swap two values between two class objects using friend function.
4. To find minimum of two numbers between two class objects using friend function.
5. To overload unary minus operator which changes sign of given vector (3 elements)
6. To overload Binary + operator which adds two complex numbers.
7. To process students mark list using multiple inheritance
8. Process employee details using hierarchical inheritance
9. To process family details using hybrid inheritance
10. To process electricity billing using binary file.
11. To process mark listing using binary file.
12. To perform stack operations.
13. To perform queue operations.
14. To manipulate singly linked list
15. To perform tree traversal.
16. To perform Insertion Sort
17. To perform Selection Sort

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF MATHEMATICS WITH CA
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc(IT)**	**Part III**	**: Allied**
Semester	**: III**	**Hours per week**	**: 04**
Sub. Code	**: 18UITA31**	**Credit**	**: 04**

OPERATIONS RESEARCH

Course Outcomes:
CO1: To develop skills in Mathematical formulation and Solving of LPP.
CO2: To solve specialized LPP like transportation and assignment problems.
CO3: To introduce about Network problems.
CO4: To develop skills in solving real life Network problems.

Unit-I:

Mathematical Formulation of a LPP: General form of a LPP – Summation notation – Matrix form – Canonical form – Standard form - Solution of LPP by Graphical Method.

Unit-II:

The Simplex Method – The Big M Method – Duality in LPP (Problems only).

Unit- III:

Transportation Problems: Mathematical Formulation of TP - Determining Initial Basic Feasible Solution (all methods) - Optimum solution of TP (MODI Method).

Unit -IV:

Assignment Problems: Mathematical formulation of Assignment Problems – Solution to Assignment Problems.

Unit -V:

Network Flow Problems – Minimal Spanning Tree Problem – Shortest Route Problems.

Text Books:

1. Dr. Arumugam. S, Thangapandi Isaac. A, **Topics in Operations Research – Linear Programming**, New Gamma Publishers Pvt. Ltd, March 2015, Palayamkottai, Tirunelveli.

2. KantiSwarup, P.K. Gupta, Man Mohan, **Operations Research**,17th Edition, Sultan Chand and Sons, 2014, New Delhi.

Unit I :	Text Book 1: Chapter 3 - Sections: 3.2, 3.4.
Unit II :	Text Book 1: Chapter 3 – Sections: 3.5, 3.6, 3.9.
Unit III :	Text Book 1: Chapter 4 – Section: 4.1
Unit IV :	Text Book 1: Chapter 5 – Sections: 5.1,5.2
Unit V :	Text Book 2: Chapter 24 – Sections: 24.2, 24.3, 24.4.

Reference Books:

1. Rathindra P. Sen, **Operations Research Algorithms and Applications**, PHI, EEE, 2010, New Delhi.

2. PanneerSelvam.R, **Operations Research**, PHI, Second Edition, 2010, New Delhi.

3. Kalavathy. S, **Operations Research**, Vikas publishing house Pvt Ltd., 4th Edition, 2013, New Delhi.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part IV**	**: Skill**
Semester	**: III**	**Hours per week**	**: 02**
Sub. Code.	**: 18UITSP3**	**Credit**	**: 02**

WEB TECHNOLOGY - LAB

Course Outcomes:

CO1: To demonstrate competency in the use of common HTML code.
CO2: To demonstrate proficiency in the use of a WYSIWYG design software.
CO3: To understand how CSS will affect web page creation.
CO4: To develop a dynamic webpage by the use of vbscript.

List of Programs:

1. Program to illustrate body and pre tags
2. Program to illustrate text Font tag
3. Program to illustrate comment,h1….h6, and div tag
4. Program to illustrate text formatting tags
5. Program to illustrate Order List tag
6. Program to illustrate Unorder List tag
7. Program to illustrate Nested and Definition tag
8. Program to illustrate Img tag
9. Program to illustrate Hyper Link tag (Anchor tag)
10. Program to illustrate Table tag
11. Program to illustrate Frame tag
12. Program to illustrate Form tag
13. Program to illustrate span tag
14. Program to illustrate CSS (cascading style sheet)
15. Program to illustrate Embedded Multimedia
16. Generate Date and Time using VbScript
17. Fibonacci Series Program using VbScript
18. Validation Program using VbScript
19. Program using Array Functions in VbScript
20. Program using String Functions in VbScript

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part IV**	**: NME**
Semester	**: III**	**Hours**	**: 02**
Sub.Code	**: 18UITN31**	**Credit**	**: 02**

PC SOFTWARE – LAB

Course Outcomes:

CO1: To create professional and academic documents.
CO2: To create personal, academic and business documents following current professional and/or industry standards.
CO3: To get knowledge about document maintenance and presentation which will be used in companies or offices.
CO4: To create presentations using custom animation and slide transition.

MICROSOFT WORD

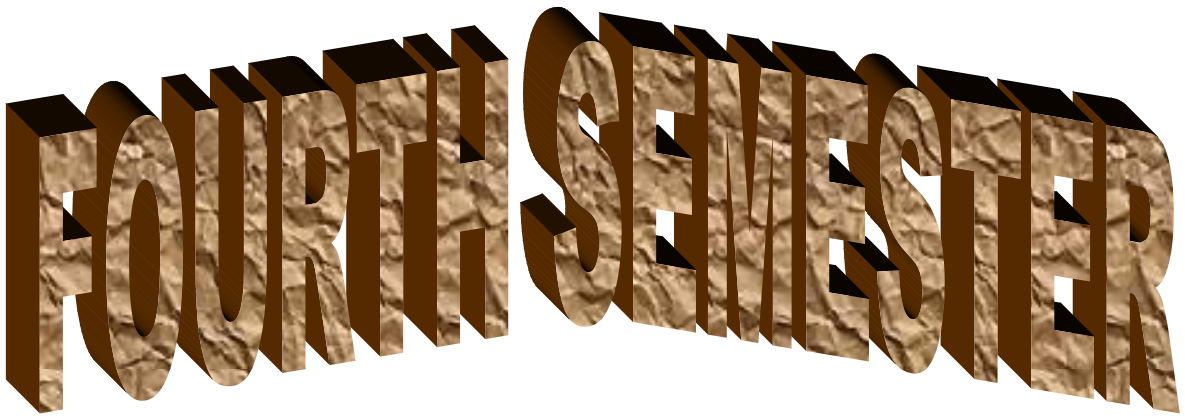
9. Document using header, footer and border.
10. Insert Picture To Create Invitation
11. Mail Merge
12. Table Manipulation
13. Designing a College Application Form
14. Welcome Message Using Macros

MICROSOFT EXCEL

5. Student Mark Details With Chart
6. Electricity Bill Preparation
7. Company Budget Using MS Excel
8. Multiple Worksheet
9. Sorting and Subtotal

MICROSOFT POWERPOINT

4. Blank slide Preparation
5. Templates Presentation
6. Animation of Cars
7. Using Custom Animation and Slide Transition


FOURTH SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part III**	**: Core**
Semester	**: IV**	**Hours per week**	**: 05**
Sub. Code	**: 18UITC41**	**Credit**	**: 04**

JAVA PROGRAMMING

Course Outcomes:
CO1: To understand the concept of object oriented programming.
CO2: To understand the concept of multithreading, package and exception.
CO3: To acquire programming knowledge in Java
CO4: To read and make elementary modifications to Java programs that solve real-world problems.

UNIT I

Java Evolution: Java Features – Difference between Java and C - Difference between Java and C++ - Java and Internet –Hardware and Software Requirements – Java Support Systems – Java Environment.

Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments – Constants, Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants – Type Casting.

UNIT II

Decision Making and Branching: Decision Making with If Statement – Simple if Statement – If-Else Statement – Nesting of If-Else Statement – The Else If Ladder – Switch Statement- The Conditional Operator.

Looping Statement: The While Statement – The Do Statement – For Statement – Jumps in Loops.

Classes, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – constructors- Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods.

UNIT III

Arrays, Strings and Vectors: One Dimensional Array – Creating an Array - Two Dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

Interfaces: Defining Interfaces -Extending Interfaces- Implementing Interfaces – Accessing Interface Variables.

UNIT IV

Packages: Java API Packages - Using System Packages – Naming Conversions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.

Multithreaded Programming: Creating Threads – Extending The Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods –Thread Exceptions – Thread Priority – Synchronization – Implement The Runable Interface.

UNIT V

Managing Errors and Exception: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements - Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.

Applet Programming: How Applet Differ from Applications – Preparing to Write Applet – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML – Running The Applet.

Servlets: The Life cycle of a Servlet – Using Tomcat for servlet development – A simple servlet.

Text Books:

1. Balagurusamy.E, **Programming with Java**, Tata McGraw Hill Private Limited, Fifth Edition, 2013, New Delhi.

UNITS **CHAPTERS**

Unit I: Chapters - 2 - Section 2.2 to 2.4,2.7 to 2.9
Chapters - 3 - Section 3.2, 3.5 to 3.7, 3.9 to 3.11
Chapters - 4- Section 4.2 , 4.3, 4.6 – 4.9

Unit II: Chapters - 6 - Section 6.2 - 6.8
Chapters - 7 - Section 7.2 - 7.5

Unit III: Chapters - 8 - Section 8.2 -8.12
Chapters - 9 - Section 9.2 - 9.8.
Chapters - 10- Section 10.2 - 10.5

Unit IV: Chapters - 11 - Section 11.2 - 11.10
Chapters - 12 - Section 12.2 – 12.10

Unit V: Chapters - 13 - Section 13.2 -13.7, 13.9
Chapters - 14 - Section 14.2 to 14.10

2. Herbert Schildt, **Java 2: The Complete Reference**, Tata McGraw Hill Private Limited, Seventh Edition, 2009, New Delhi.

Unit V: Chapter 31 – Pages 907 to 911

Reference Books:

1.Radha Krishna.P, **Object Oriented Programming With Java,** University Press India Private Limited, 3rd Edition, 2008, Hyderabad.

2.Debasish Jana, **Java Object Oriented Programming Paradigm**, Prentice Hall of India Private Limited, 3rd Edition, 2008, New Delhi.

3. Radha Krishna. P, **Object Oriented programming through Java**, University Press, 2017

Reference Websites:

1. www.tutorialspoint.com/java
2. www.javatpoint.com/java-tutorial
3. www.w3schools.com/java

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part III**	**: Core**
Semester	**: IV**	**Hours per week**	**: 05**
Sub. Code	**: 18UITCP4**	**Credit**	**: 05**

JAVA PROGRAMMING - LAB

Course Outcomes:

CO1: To understand better the object-oriented approach in programming.
CO2: To be able to write computer programs to solve real world problems in Java
CO3: To learn and appreciate the importance and merits of proper comments in source code and API documentations
CO4: To write simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.

List of Programs:

1. To find out the list odd and even numbers
2. To check for Vote programming
3. To find out theWeek days
4. To check Print n values
5. To check Biggest among three numbers
6. To prepare the Student mark list
7. To check Factorial value
8. To check Armstrong number
9. To check Adam number
10. Generate the prime number
11. To check Palindrome
12. To find out Sum of array elements
13. To display the Minimum & maximum number.
14. To check Matrix multiplication
15. Student details using multilevel inheritance
16. Exception handling using throw
17. Key events
18. Displaying shapes using applet
19. Applet program using parameter tag
20. To count the number of characters ,words & lines in a file

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION
(For those who joined in 2018-2019 and after)

Programme	**: B.Sc.(IT)**	**Part III**	**: Allied**
Semester	**: IV**	**Hours per week**	**: 04**
Subject Code	**: 18UITA41**	**Credit**	**: 04**

DIGITAL PRINCIPLES AND APPLICATIONS

Course Outcomes

CO1: To understand the concepts of binary, octal and hexadecimal conversions, digital logic gates and codes

CO2: To know about arithmetic, combinational logical circuits and data processing circuits

CO3: To get a strong idea in Flip-flops, counters and registers.

Unit-I

Number systems, Digital logic and Codes

Number systems:

Introduction – binary number system- binary to decimal conversion-decimal to binary conversion- octal numbers –Hexa decimal numbers.

Digital logic and Codes:

Basic Gates: NOT Gate-OR Gate- AND Gate-Universal Logic Gates: NOR and NAND Gate- Exclusive –OR Gate- ASCII code-Excess-3 code-Gray code.

Unit-II

Combinational Logic Circuits

Boolean Laws and Theorems-Sum of-Products Method-Truth table to Karnaugh Map-Pairs, Quads and octets – Karnaugh Map Simplification-Don't care Conditions- Product of Sum Method-Product of Sums Simplification.

Unit-III

Arithmetic Circuits and Data -Processing Circuits:

Arithmetic Circuits:

Binary Addition-Binary Subtraction-Unsigned Binary Numbers-Sign- magnitude Numbers-2's Complement representation-2's complement arithmetic-Arithmetic building blocks.

Data -Processing Circuits:

Multiplexer –Demultiplexer –1-of-16 decoder- BCD to decimal decoder- seven segment decoder-Encoder.

Unit-IV

Flip-flops:

Introduction- RS flip-flop Using NOR and NAND gates-Gated Flip- flops: Edge Triggered RS Flip-Flop –Edge Triggered D-Flip-flop –Edge Triggered JK flip flop- JK Master- Slave flip-flop.

Unit-V

Registers and Counters

Register:

Types of Registers- Serial In- Serial Out shift register – Serial In- Parallel Out shift register – Parallel In- Serial Out shift register – Parallel In- Parallel Out shift register.

Counters:

Ring counter-Asynchronous counter – Synchronous counter –UP/Down counter.

Text books:

1. Morris Mano. M, **Digital Logic and Computer Design**, Prentice Hall of India, 2002, New Delhi.

2. Salivahanan.S and Arivazhagan.S, **Digital Circuits and Design**, Vikas Publication House Private Ltd, Noida, 2nd edition,2009.

Reference Books:

1. Albert Paul Malvino and Donald P. Leach, **Digital principles and applications**, Tata McGraw Hill Publishing Company Ltd, 7th edition, 2005, New Delhi.

2. Stephen Brown ZvonkoVranesic, **Fundamentals of Digital Logic Design with VHDL**, special Indian Edition, TMH, 2006, New Delhi.

3. Saxena A.K**. Digital Electronics** CBS Publications, 2014.

Unit I: Chapter 5 Section: 5.1 to 5.8, Chapter 2 Section 2.1 to 2.2,

Chapter 4- Section 4.7

Unit II: Chapter 3 Section: 3.1 to 3.8

Unit III: Chapter 6 Section: 6.1 to 6.7, Chapter 4 Section: 4.1 to 4.6

Unit IV: Chapter 8 Section: 8.1 to 8.5, 8.8

Unit V: Chapter 9 Section: 9.1 to 9.5,

Chapter 8 Section: 8.1,8.2,8.7, Chapter 9 Section -9.4.1(Text Book no. 2)

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme	**: UG**	**Part IV**	**: Skill**
Semester	**: IV**	**Hours per week**	**: 2**
Sub. Code	**: 18UITSP4**	**Credit**	**: 2**

PHP WITH MYSQL –LAB

Course Outcomes:

CO1: To understand the basic program constructs such as if/else, switch, loops, arrays and functions and be able to use them in the PHP script.

CO2: To use built-in features of PHP such as data and string manipulation.

CO3: To test and debug PHP scripts while working with live data.

CO4: To Alter the content of a web page dynamically using the combination of data from the MySQL database and PHP methods such as the type of browser the user has, the date, and time.

List of Programs:

1. Program to display Text messages.
2. Program to print an array.
3. Program to print each element of an array using for each().
4. Program to sort elements in an array in ascending and descending order.
5. Program to find the sum of elements in an array.
6. Program to join the array elements into a string.
7. Program to merge two arrays into a new array.
8. Program to remove the duplicated values from an array.
9. Programs to create simple Login and Logout using sessions.
10. Program to connect to the server and selecting database.
11. Program to insert records to the table in Database.
12. Program to fetch records from the table in Database.
13. Program to Store an image in Database.
14. Program to Read image from Database.
15. Program to create a simple Registration form.

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Programme	**: UG**	**Part IV**	**: NME**
Semester	**: IV**	**Hours per week**	**: 02**
Sub. Code	**: 18UITN41**	**Credit**	**: 02**

HTML PROGRAMMING - LAB

Course Outcomes:

CO1: To demonstrate competency in the use of common HTML code.
CO2: To demonstrate proficiency in the use of a WYSIWYG design software.
CO3: To understand how CSS will affect web page creation.
CO4: To develop a webpage using tables and frames.

List of Programs:

1. Program to illustrate body and pre tags
2. Program to illustrate text Font tag
3. Program to illustrate comment,h1….h6, and div tag
4. Program to illustrate text formatting tags
5. Program to illustrate Ordered List tag
6. Program to illustrate Unordered List tag
7. Program to illustrate Nested and Definition tag
8. Program to illustrate Img tag
9. Program to illustrate Hyper Link tag (Anchor tag)
10. Program to illustrate Table tag
11. Program to illustrate Frame tag
12. Program to illustrate Form tag
13. Program to illustrate span tag
14. Program to create a web page using style sheet
15. Program to design a bio-data


FIFTH SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Class	**: B.Sc (IT)**	**Part III**	**: Core**
Semester	**: V**	**Hours**	**: 06**
Sub Code	**: 18UITC51**	**Credits**	**: 04**

RELATIONAL DATABASE MANAGEMENT SYSTEM

Course Outcomes:

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

CO1: Explain the structure and model of the relational database system.

CO2: Make a study of SQL and Relational database design.

CO3: Analyze different information about the organization requiring an electronic database and translate them to user requirements.

CO4**:** Interpret knowledge in transaction processing with relational database design.

CO5: Create and populate a RDBMS for a real life application, with constraints, keys using SQL.

Unit I

Introduction**: View of Data - Database languages- Relational databases – Database design – Transaction Management – Database Architecture-**Introduction to the Relational Model: **Structure of Relational Databases – Databases Schema – Keys – Schema Diagrams - Relational Query Languages – Relational Operations.**

Unit II

Introduction to SQL: **Overview of the SQL Query Language – SQL Data Definition - Basic Structure of SQL Queries – Additional Basic Operations - Set Operations – NULL Values - Aggregate Functions – Nested Sub Queries – Modification of the Databases**. Intermediate SQL: **Join expressions – Views – Transactions - Integrity Constraints – SQL Datatypes and Schemas.**

Unit III

Advanced SQL: **Functions and Procedures – Triggers-**Formal Relational Query Languages: **The Relational Algebra – The Tuple Relational Calculus – The Domain Relational calculus.** Database Design and the ER Model: **The Entity Relationship Model – Constraints - Entity Relationship Diagrams.**

Unit IV

Relational Database Design: **Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Functional Dependency Theory – Decomposition using Multivalued Dependencies – More Normal Forms.** Transaction Management: **Transactions- Transaction Concept –Serializability.**

Unit V

Error Handling: Exceptions-Built – in Exceptions-User Defined Exceptions-**Subprograms in PL/SQL:** Describing a Subprogram-Procedure-Functions-**Trigger:** Sample Trigger-Trigger Concept

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S .Sudarshan, Data Base System Concepts (Sixth Edition) McG. Hill International Edition, 2011.

Unit I	**Chapter 1 –1.3-1.6,1.8,1.9**
	Chapter 2– 2.1-2.6
Unit II	**Chapter 3– 3.1-3.9**
	Chapter 4 – 4.1-4.5
Unit III	**Chapter 5 – 5.2,5.3**
	Chapter 6 – 6.1-6.3
	Chapter 7 – 7.2,7.3,7.5
Unit IV	**Chapter 8– 8.2-8.4,8.6,8.7**
	Chapter 14– 14.1,14.6

2. Dr.P.S.Deshpande , **SQL & PL/SQL for Oracle 11g Black Book ™,** Dreamtech Press, New Delhi, Reprint 2007.

Unit V Chapter 30 Page No : 542-546

Chapter 31 Page No : 560-563

Chapter 33 Page No : 609-625

Reference Books:

1. C.J.Date, An Introduction to Database Systems Vol.1, Narosha Publishing House, New Delhi,1995.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems (Third Edition), McGraw-Hill Education, New Delhi,2003.
3. Bulusu Lakshman Oracle9i PL/SQL: Adeveloper's Guide, Apress

Websites:

1. https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm
2. https://www.webopedia.com/TERM/R/RDBMS.html

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Class	**: B.Sc(IT)**	**Part III**	**: Core**
Semester	**: V**	**Hours**	**: 06**
Sub Code	**: 18UITCP5**	**Credits**	**: 05**

RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

COURSE OUTCOMES:

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

CO1 Use data manipulation language to query, update, and manage a database
CO2 Describe the fundamental elements of relational database management systems
CO3 Analyze the database using queries to retrieve records
CO4 Create views to satisfy the user's changing requirements
CO5 Apply PL/SQL for processing database

TABLE MANIPULATION

1. Table Creation, Renaming a Table, Copying another Table, Dropping a Table
2. Table Description: Describing Table Definitions, Modifying Tables, Joining Tables, Number and Date Functions.

SQL QUERIES AND SUB QUERIES

3. SQL Queries: Queries, Sub Queries, and aggregate functions
4. DDL: Experiments using database DDL SQL statements
5. DML: Experiment using database DML SQL statements
6. DCL: Experiment using database DCL SQL statements

EXCEPTION HANDLING AND PL/SQL

7. Exception Handling: PL/SQL Procedure for application using exception handling
8. Functions: PL/SQL Procedure for application using functions
9. Cursor: PL/SQL Procedure for application using cursors
10. Trigger: PL/SQL Procedure for application using triggers
11. Package: PL/SQL Procedure for application using package

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Class : B.Sc (IT) **Part III: Core**
Semester : V **Hours : 06**
Subject Code : 18UITC52 **Credits : 05**

OPERATING SYSTEM

Course Outcomes:

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

CO1: Understand the concept of Operating system types and its structures.

CO2: Apply the different process synchronization techniques to avoid Deadlocks.

CO3: Analyze the various process scheduling algorithms to make effective communication between the processes.

CO4: Evaluate the page replacement algorithms for efficient use of memory and File system implementation.

CO5: Build Multiprocessor systems by using process synchronization techniques and memory management Techniques.

Unit I

Introduction: What Is an Operating System? – Mainframe Systems – Desktop systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments.**Operating-System Structures :** System Components - Operating System Services- System Calls –System Programs-System Structure- Virtual Machines - System Design and Implementation- System Generation.

Unit II

Processes: Process Concept-Process Scheduling – Operations on Processes- Cooperating Processes- Interprocess Communication – Communication in Client- Server Systems. **CPU Scheduling:** Basic Concepts - Scheduling Criteria-Scheduling Algorithms- Multiple–Processor Scheduling – Real-Time Scheduling-Algorithm Evaluation –ProcessScheduling Models.

Unit III

Process Synchronization: The Critical-Section Problem –Synchronization Hardware-Semaphores- Classic Problems of Synchronization – Critical Regions – Monitors- OS Synchronization. **Deadlocks:** System Model - Deadlock Characterization – Methods for Handling Deadlocks –Deadlock Prevention –Deadlock Avoidance-Deadlock Detection - Recovery from Deadlock.

Unit IV

Memory Management: Swapping – Contiguous Memory Allocation- Paging – Segmentation- Segmentation with Paging- **Virtual Memory:** Demand Paging – Process Creation – Page Replacement – Allocation of Frames- Thrashing – Operating System Examples.

Unit V

File-System Implementation: File-System Structure - File-System Implementation – Directory Implementation – Allocation Methods – Free-space Management – Efficiency and performance – Recovery – Log Stuctured File System – NFS. **Mass-Storage Structure:** Disk Structure –Disk Scheduling- Disk Management- Swap- Space Management – RAID Structure – Disk Attachment – Stable-Storage Implementation – Tertiary-Storage Structure.

Text Book:

1. Silberchatz A., Galvin P.B., Gagne G., "**Operating System Concepts",** Sixth Edition,
   2003, John Wiley & Sons, INC.

Unit I	Chapter 1, Chapter 2
Unit II	Chapter4, Chapter 6
Unit III	Chapters - 7.2 To 7.8, Chapter 8
Unit IV	Chapters – 9.2 To 9.6, Chapters 10.2 To 10.7
Unit V	Chapters 12 , Chapter 14

Reference Books:

1. Milan Milan Kovic, **Operating System Concepts and Design,** Tata McGraw Hill, New Delhi, 1997.
2. Harvey M. Deitel, **Operating System**, Pearson Education, New York, Third edition, 2008.

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Programme	**: B.Sc (IT)**	**Part III**	**: Elective I**
Semester	**: V**	**Hours**	**: 05**
Sub Code	**: 18UITE51**	**Credits**	**: 04**

COMPUTER NETWORKS

Course Outcomes:

On the successful completion of the course, learners should be able to

CO1: Explain about building blocks of Computer Networks, components and transmission media.

CO2: Demonstrate the functionalities and protocols in the layers of ISO/OSI network model.

CO3: Make use of data link layer protocols in Error detection and correction

CO4: Apply suitable routing strategies for a given network and Choose appropriate access control, congestion control and congestion avoidance technique for given traffic scenario.

CO5: Assess the functions of Application layer paradigms and protocols and Design for the real- time applications.

Unit I

Introduction: Data Communications – Networks – Protocols and Standards – **Network Models**: Layered Tasks – The OSI Model – Layers in the OSI Model – TCP/IP protocol suite.

Unit II

Physical Layer: **Transmission Media**: Guided media – Unguided Media: Wireless - **Wireless WANs: Cellular Telephone and Satellite Networks**: Cellular Telephony – Satellite Networks.

Unit III

Data Link Layer: **Error Detection and Correction**: Introduction – Block Coding – Linear Block Codes – Cyclic Codes – Checksum –**Data Link Control**: Framing – Flow Control and Error Control – Protocols – Noiseless Channels–Noisy Channels

Unit IV

Network Layer: **Delivery, Forwarding and Routing**: Delivery – Forwarding – Multicast Routing Protocols–**Congestion Control and Quality of Service**: Data Traffic – Congestion – Congestion Control – Quality of Service.

Unit V

Application Layer: Domain Name System-DOMAIN NAME SPACE -DNS in the Internet-**Remote Logging, Electronic Mail, and File Transfer:** Electronic Mail-File Transfer-**WWW and HTTP**:Architecture-Web Documents-HTTP.

Text Book:

1. Behrouz A.Forouzan, **Data Communications and Networking**, Tata McGraw Hill Education Private Limited, New Delhi, Fourth Edition, Eighteenth reprint 2010.

Unit I: Chapter 1 – Section: 1.1, 1.2, 1.4 Chapter 2 – Section: 2.1- 2.4.

Unit II: Chapter 7 – Section: 7.1, 7.2 Chapter 16 – Section: 16.1, 16.2.

Unit III: Chapter 10 – Section: 10.1-10.5 Chapter 11 – Section: 11.1-11.5.

Unit IV: Chapter 22 – Section: 22.1, 22.2, 2.4 Chapter 24 – Section: 24.1- 24.3, 24.5.

Unit V: Chapter 25 – Section: 25.2, 25.4, Chapter 26 –Section: 26.2, 26.3, Chapter 27– Section : 27.1- 27.3.

Reference Books:

1. Andrew S.Tanenbaum, Computer Networks, Prentice Hall of India Pvt Ltd., New Delhi, Fourth Edition, 2004.
2. William Stallings, Data and Computer Communications, Prentice Hall of India, New Delhi, Seventh Edition, 2004.

Websites:

1. https://www.javatpoint.com/types-of-computer-network
2. https://www.tutorialspoint.com/computer_fundamentals/computer_networking
3. https://www.studytonight.com/computer-networks/

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Programme : B.Sc (IT) **Part III : Elective**
Semester : V **Hours : 05**
Subject Code : 18UITE52 **Credits : 04**

BIOMETRICS

Course Outcomes:

On Successful Completion of this Course, the Students are able to

CO1: Describe the importance of Authentication System and raise awareness of privacy issues for end users and students.

CO2: Use of different types ofbiometric system.

CO3: Differentiating the different types of biometrics and their uses.

CO4: Importance of Liveness Testing.

CO5: Apply Facial, iris biometric, voice biometric, physiological biometrics etc. for identification.

Unit I

How Authentication Technologies Work? Passwords and Pins-Cards and Tokens-Biometrics-Multifactor Authentication-Subverting the System-Deploying Authentication Systems-Economics of Authentication.**How Biometrics Work?** Brief History of Biometrics-Why use Biometrics? Key Elements of Biometric Systems

Unit II **Fingerprint and Hand Geometry**: History of Fingerprints-Fingerprints Cards-Manual Matching of Fingerprints-The First age of Automation-The Second age of Automation-Template Extraction and size-Robustness, Expected Accuracy-Vulnerabilities.**Facial and Voice Recognition:** Facial Recognition Applications- Facial Recognition Technology-Voice Verification

Unit III

Eye Biometrics: Iris and Retina Scanning – **Signature Recognition and Keystroke Dynamics:** How Signature Recoginition Works? History and Development-Implementation Issues-Limitations-Keystroke Dynamics History-Application-Digraph Representation-Other uses.

Unit IV

Esoteric Biometrics: Vein Pattern-Facial Thermography-DNA-Sweat Pores-Hand Grip-Fingernail Bed-Body odor-Ear-Gait-Skin Luminescence-Brain Wave Pattern-Footprint and Foot Dynamics. **Biometric Liveness Testing**: Why test for Liveness? Why not? What is Liveness Testing? Difficulties with Liveness Testing-Best Approaches to Liveness Testing.

Unit V

Biometrics in Large Scale Systems: Getting Started-Documenting the Procurement Process-Specifying the Systems. **Biometric Testing and Evaluation:** Who Tests and Who Benefits? The Three Bears Principle-Best Practices for Biometric Testing-Types of Testing.

Text Book:

1. John D.Woodward, Jr, Nicholas M.Orlans, Peter T. Higgins, **Biometrics – The Ultimate Reference**, Dream Tech Publishers, New Delhi, 2003.

   Unit I Chapters - 1, 2
   Unit II Chapters - 3, 4
   Unit III Chapters - 5, 6
   Unit IV Chapters - 7, 8
   Unit V Chapters - 9, 11

Reference Books:

1. Paul Reid, **Biometrics for Network Security**, Prentice Hall Series in Computer Networking and Distributed, New Delhi, 2004.
2. James L. Wayman (Editor), Anil Jain (Editor), Davide Maltoni , Dario Maio, **Biometric Systems: Technology, Design and Performance Evaluation**,Springer Publications, London, 2005.

Websites:

1. https://www.techopedia.com/definition/26991/biometric-data
2. www.biometric-security-devices.com/types-of-biometric-devices.html
3. www.idiap.ch/en/scientific-research/biometrics-security-and-privacy

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Class : B.Sc(IT) **Part III : Elective**
Semester : V **Hours : 05**
Subject Code : 18UITE53 **Credits : 04**

SYSTEM SOFTWARE

Course Outcomes:

On successful completion of the course, the learners should be able to:

CO1 Describe the various machine architectures and explain the function of assemblers, loader and linkers, Macroprocessors, Compilers and DBMS

CO2 Make use of the features of dependent and independent software

CO3 Focus the algorithm and data structures of assemblers, loader, compilers

CO4 Interpret the code using analysis and optimization techniques

CO5 Imagine an editor that use high level source code and parse the data

UNIT I

Background: System software and machine architecture – The simplified Instructional Computer (SIC) – SIC Machine architecture – SIC/XE Architecture - Traditional (CISC) Machines – VAX Architecture – Pentium Pro Architecture - RISC Machines – UltraSPARC Architecture – PowerPC Architecture – Cray T3E Architecture.

UNIT II

Assemblers: Basic Assembler Functions- A Simple SIC Assembler – Assembler Algorithm and Data Structures – Machine – Independent Assembler Features – Literals – Symbol-Defining Statements – Expressions – Program Blocks – Control Sections and Program Linking – Assembler Design Options – One – Pass Assemblers – Multi-Pass Assemblers.

UNIT III

Loaders and Linkers: Basic Loader Functions – Design of an Absolute Loader – A simple Bootstrap Loader – Machine – Dependent Loader Features – Relocation- Program Linking-Algorithm and Data Structures for a Linking Loader. **Macro Processors:** Basic Macro Processors Functions – Macro Definition and Expansion – Macro Processor Algorithm and Data Structures.

UNIT IV

Compilers: Basic Compiler Functions – Grammars – Lexical Analysis – Syntactic Analysis – Code Generation – Machine – Independent Compiler Features – Structured Variables-Machine – Independent Code Optimization – Storage Allocation - Block Structured Languages – Compiler Design Options – Division into Passes – Interpreters – P –Code Compilers – Compiler – Compliers.

UNIT V

Other System Software: Database Management Systems – Basic Concepts of a DBMS – Levels of Data Description – Use of a DBMS – Text Editors – Overview of the Editing Process – User Interface – Editor Structure.

Text Book:

1. Leland L.Beck, D.Manjula, **SYSTEM SOFTWARE**, Pearson Education, India, Third Edition, 2007.

Unit I : Chapter 1: 1.2 - 1.5

Unit II : Chapter 2: 2.1, 2.3, 2.4

Unit III : Chapter 3: 3.1, 3.2

Chapter 4: 4.1

Unit IV : Chapter 5: 5.1, 5.3, 5.4

Unit V : Chapter 7: 7.1, 7.2

Reference Books:

1. D.M.Dhamdhere**, Introduction to System Software**, Silicon Press, USA, reprint, 1997.
2. John J Donovan, **Systems Programming**, Tata McGraw Hill, New Delhi, Forty Sixth reprint, 2009.
3. I.A.Dhotre, A.A.Puntambekar, **System Software**, Technical Publications, First Edition, 2007.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Class : B.Sc IT **Part III : Elective**
Semester : V **Hours : 05**
Subject Code: 18UITE54 **Credits : 04**

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

On successful completion of the course, the learners should be able to:

CO1: Explain about Concepts of Security, types of attacks, cryptographic algorithms, various internet security protocols and basics of authentication.

CO2: Determine about various cryptographic techniques, algorithms types and digital signature.

CO3: Classify various attacks, symmetric key and asymmetric cryptographic algorithms, internet security protocols and various user authentication mechanism.

CO4: Assess the cryptographic techniques, DES and cryptographic algorithms, and different security protocols.

CO5: Interpret the, cryptography techniques, symmetric and asymmetric cryptographic algorithms , security protocols, security mechanism.

Unit I

Introduction to the Concepts of Security: Introduction – The need for security- Security Approaches – Principles of Security – Types of Attacks – Cryptography Techniques – Introduction – Plain Text and Cipher Text – Substitution Techniques – Transposition Techniques – Encryption and Decryption – Symmetric and Asymmetric Key cryptography – Steganography – Key range and Key size – Possible type of Attacks.

Unit II

Computer Based Symmetric Key Cryptographic Algorithms: Introduction – Algorithm types and Modes – An Overview of Symmetric Key Cryptography – Data Encryption Standard (DES) – International Data Encryption Algorithm (IDEA) – RC$ - RC5 – Blowfish – Advanced Encryption standard (AES).

Unit III

Computer Based Asymmetric Key Cryptographic Algorithms: Introduction – An Overview of Asymmetric Key Cryptography – RSA Algorithm – Elgamal Cryptography – Symmetric and Asymmetric Key Cryptography – Digital Signature – Knapsack Algorithm –

Elgamal Digital Signature – Attacks on Digital Signature – Problems with Public Key Exchange . **Public Key Infrastructure (PKI) : Introduction –** Digital Signature - Private Key Management – The PKIX model – Public Key Cryptographic standards (PKCS) – XML - PKI and Security .

UnitIV

Internet Security Protocols : Introduction – Basic Concepts – Secure Socket Layer (SSL) - Transport Layer Security (TLS) – Secure Hyper Text Transfer Protocol (SHTTP) – Secure Electronic Transaction (SET) – SSL Versus SET – 3-D Secure Protocol – Email Security – Wireless Application Protocol (WAP) Security – Security in GSM – Security in #G – IEEE 802.11 Security – Link Security versus Network Security.

UNIT V

User Authentication Mechanism: Introduction - Authentication Basics – Passwords – Authentication Tokens – Certificate Based Authentication – Biometric Authentication – Kerberos – Key Distribution Centre – Security Handshake Pitfalls – sngle sign on Approaches – attacks on Authentication Schemes. **Network Security, firewalls and Virtual Private Networks (VPN) :** Introduction – Brief Introduction to TCP/IP – Firewalls – IP Security – Virtual Private Network – Intrusion.

Text book:

1. Atul Kahate, Cryptography and Network Security – McGraw Hill Education (India) Private Limited First Edition 2013.

Unit I: Chapter 1, 2: 1.1-1.5, 2.1 – 2.9.

Unit II: Chapter 3: 3.1 – 3.9.

Unit III: Chapter 4, 5: 4.1 – 4.11, 5.1 – 5.6

Unit IV: Chapter 6: 6.1-6.14.

Unit V: Chapter 7, 9: 7.1 – 7.11, 9.1 – 9.6.

References:

1. William Stallings, Cryptography and Network Security – Prentice Hall Publications 4 th Edition 2005.

2. Behrouz A.Forouzan , Cryptography and Network Security – McGraw Hill Publications.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
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Class	**: B.Sc (IT)**	**Part III**	**: Elective**
Semester	**: V**	**Hours**	**: 05**
Subject Code:	**18UITE55**	**Credits**	**: 04**

SOFTWARE ENGINEERING

COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: Explain about software engineering life cycle and process model in software development.

CO2: Prepare the SRS, Design document, Project plan of a given software system.

CO3: Apply Project Management and Requirement analysis, Principles to S/W project development.

CO4: Analyze the cost estimate and problem complexity using various estimation techniques

CO5: Assess SQA in software project through various testing strategies with quality management.

Unit I

Introduction to Software Engineering: The Evolving role of Software – Software – The changing Nature of Software – Legacy software –**A Generic View of Process**: Software Engineering-A Process framework-The Capability Maturity Model Integration(CMMI)-**Process Models:** Prescriptive Models -The Waterfall Model – Incremental Process Models – Incremental Model – The RAD Model – Evolutionary Process Models – Prototyping – The Spiral Model.

Unit II

Requirements Engineering: Requirements engineering tasks – Initiating the requirements Engineering Process- Eliciting Requirements - Negotiating Requirements – Validating Requirements **Building the Analysis Models** –Requirement analysis-Scenario-Based Modeling-Flow-Oriented Modeling-Creating a Behavioral Model.

Unit III

Design Engineering: Design Process and Design Quality-Design Concepts-The Design Model-**Modeling Component-Level Design**: What is a Component? Designing Class-Based Components-Designing Conventional Components. **Performing User Interface Design**: The Golden Rules-User Interface Analysis and Design-Design Evaluation.

Unit IV

Testing Strategies: A strategic approach to Software Testing-Test strategies for Conventional Software- Validation testing –System testing –**Testing Tactics:** Software Testing fundamentals-Black-box and White Box Texting-,White Box Testing, Basic Path testing-Control Structure Testing-Black Box Testing.

Unit V

Estimation: Observations on Estimation-Resource-Software Project Estimation-Decomposition Techniques-Empirical Estimation Models-**Quality Management:** Quality Concepts-Software Quality Assurance – Software Reviews-Formal Technical Reviews.

Text book:

1. R.S. Pressman, **Software Engineering: A Practitioner's Approach**, McGraw Hill Education (India) Private Limited, Sixth Edition, New Delhi, 2010.

Unit I: Chapter 1-Section 1.1-1.5,

Chapter 2 - Section 2.1-2.3,

Chapter 3- Section 3.1-3.4

Unit II: Chapter 7- Section 7.1-7.5,

Chapter 8- Section 8.1, 8.2, 8.5, 8.6, 8.8

Unit III: Chapter 9- Section 9.1-9.4,

Chapter 11- Section 11.1, 11.2, 11.5

Chapter 12- Section 12.1-12.2, 12.5

Unit IV: Chapter 13- Section 13.1, 13.3, 13.5, 13.6,

Chapter 14- Section 14.1-14.6

Unit V: Chapter 15- Section 15.1, 15.5-15.7

Chapter 23- Section 23.1, 23.4-23.7

References:

1. Richard Fairley, Software Engineering, Tata McGraw Hill,2016
2. Ian Sommerville, Software Engineering, 8th Edition, Pearson Education, 2008.

Websites:

1. https://www.geeksforgeeks.org/software-engineering/
2. https://www.guru99.com/software-engineering-tutorial.html
3. https://www.tutorialride.com/software-engineering/software-engineering-tutorial.htm

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme : B.Sc (IT) | **Paper III : Elective**
Semester : V | **Hours : 05**
Subject Code : 18UITE56 | **Credits : 04**

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Outcomes:
On successful completion of the course, the learners should be able to
CO1: Describe the modeling concept for object oriented development in the system.
CO2: Apply the concept of domain and application analysis for designing UML Diagrams.
CO3: Classify the different classes based on the classification theory and its approaches.
CO4: Evaluate the UML models for various development stages of System using the appropriate UML notation.

CO5: Develop and explore the conceptual model into various scenarios and applications.

Unit I

An overview of object-oriented systems development: Introduction – Two Orthogonal Views of the Software – Object-Oriented Systems Development Methodology – **Object basics:** Object State and Properties – Object Behavior and Methods – Object Respond to Messages – Encapsulation and Information hiding – Class hierarchy – Polymorphism – Object Relationships and Associations – Aggregations and Object Containment – Advanced Topics. **Object-Oriented Systems Development Life Cycle:** Introduction – The Software Development Process – Building High Quality Software – A Use Case Driven Approach – Reusability.

Unit II

Introduction – Rumbaugh et al.'s Object Modelling Technique – The Booch Methodology – The Jacobson et al. Methodologies – Patterns – Frameworks – The Unified Approach – **Unified Modeling language**: Static and Dynamic Models – UML diagrams – UML Class Diagrams – Use-Case Diagram – UML Dynamic Modeling – Model Management: Packages and Model Organization – UML Extensibility.

Unit III
Identifying Use-Cases: Use-Case driven object oriented analysis – Use-Case model – Developing Effective Documentation – **Classification:** Introduction – Classifications Theory – Approaches for Identifying Classes – Noun Phrase Approach – Common Class Patterns Approach – Use-Case Driven Approach – Classes, Responsibilities and Collaborators – Naming Classes

Unit IV

Introduction - Associations - Super–Sub Class Relationships – A-Part-of Relationships-Aggregation – Class Responsibility: Identifying attributes and methods – Defining Attributes by Analyzing Use Cases and Other UML Diagrams – Object Responsibility:Methods and Messages – The Object-Oriented Design Process – The Object-Oriented Design Axioms – Corollaries – Design Patterns **Designing Classes**: Class visibility – Refining attributes – Designing Methods and protocols – **Object Storage And Object Interoperability**: Database Management Systems – Distributed Databases and Client-Server Computing

Unit V

Introduction – User Interface Design as a Creative Process – Designing View Layer Classes – Macro-Level Process – Micro-Level Process – The Purpose of a View Layer Interface – Prototyping the User Interface. **Software Quality Assurance:** Introduction – Quality Assurance Tests – Testing Strategies – Impact of Object Orientation on Testing – Test Cases – Test Plan – Continuous Testing – Myers's Debugging Principles.

Text Books

1. Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 1999.

Unit I	Chapter 1 - 1.1 to 1.
	Chapter 2 - 2.5 to 2.12, 2.14
	Chapter 3 - 3.1 to 3.4
Unit II	Chapter 4 - 4.1, 4.3 to 4.8
	Chapter 5 - 5.2, 5.5 to 5.10
Unit III	Chapter 6- 6.4, 6.6
	Chapter 7 - 7.1 to 7.8
Unit IV	Chapter 8- 8.1 to 8.4, 8.6, 8.7, 8.9
	Chapter 9 - 9.2 to 9.5
	Chapter 10 - 10.5, 10.6,10.8
	Chapter 11 - 11.3, 11.5
Unit V	Chapter 12 - 12.1 to 12.7
	Chapter 13 – 13.1 to 13.8

References

1. Craig Larman, "Applying UML and Patterns", Second Edition, Pearson Education, 2002.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley Long man, 1999.
3. Bernd Bruegge, Allen H. Dutoit, "Object Oriented Software Engineering using UML, Patterns and Java", Pearson Education, 2004.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Class : B.Sc(IT) **Part IV : Skill**
Semester : V **Credits : 02**
Sub code :18UITSP5 **Hours : 02**

ANDROID PROGRAMMING LAB

Course Outcomes:
On successful completion of the course, the learners should be able to

CO1: Understand different mobile application models/architectures and patterns.

CO2: Design and develop User Interfaces for the Android platform.

CO3: Apply layout design for list view and text view.

CO4: Create Android application for user application.

CO5: Implement a mobile development framework to the development of a mobile application.

1. Create " Hello Android" Application
2. How to create and display a new form, window or activity
3. Working With Different Layouts
4. Create simple and effective Login form on Android
5. Create registration form in android
6. Build a simple user interface
7. How to use Toast and Intents in android programming
8. Build android app using Widgets
9. Create Simple Browser
10. Add a simple ListView on App
11. Changing the font for Android Textviews
12. Context menu for Android
13. Android App using Color Picker
14. Create simple app with database
15. Create Age Calculator App


SIXTH SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Class : B.Sc(IT) **Part III : Core**
Semester : V I **Hours : 6**
Sub. Code : 18UITC61 **Credits : 4**

.NET PROGRAMMING

Course Outcomes:

On the successful completion of the course, learners should be able to:

CO1: Represent the insights of the Internet programming

CO2: Demonstrate design and implement complete application over the web

CO3: Connect MS.NET framework developed by Microsoft.

CO4: Evaluate the usage of recent platforms like C#, XML, and ASP.Net which is used in the development of web applications

CO5: Defend the deployment and the security in the .NET framework.

Unit-I:

Introducing C#-Understanding .NET: The C# Environment-Overview of C#-Literals,Variables and Data Types-Operators and Expressions-Decision Making andBranching-Decision Making and Looping.

Unit –II:

Methods in C#- Handling Arrays –Manipulating Strings- Structures and Enumerations.

Unit-III:

Classes and Objects - Inheritances and Polymorphism - Interface: Multiple Inheritance

Unit-IV:

Operator Overloading-Delegates and Events.

Unit-V:

Managing Console I/O Operations-Managing Errors and Exceptions.

Text Book:

1. Balagurusamy .E ,Programming in C # , Tata McGraw Hill, New Delhi, Fourth Edition, 2004.

Units Chapters

Unit I Chapters - 1 To 7

Unit II Chapters - 8 To 11

Unit III Chapters - 12 To 14

Unit IV Chapters - 15, 16

Unit V Chapters - 17, 18

Reference Books:

1. Rober Powell, Richard Weeks, C# and .NET Framework, Tech Media Publication, New Delhi, 2008.
2. E.Balagurusamy, Programming in C# and .NET, Tata McGraw Hill, New Delhi, 2010.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme : B.Sc (IT) **Part III : Core**
Semester : V I **Hours : 06**
Subject Code : 18UITCP7 **Credits : 05**

.NET PROGRAMMING LAB

Course Outcomes:

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

CO1: How to use C# and Visual Studio 2010 to build .NET Framework applications

CO2: Explain the purpose of the .NET Framework.

CO3: Apply the syntax of basic C# programming constructs.

CO4: Modify the given type of value to another type using boxing and unboxing techniques.

CO5: Conclude and call methods in a C# application using catch, handle and throw exceptions.

1. C# program for printing the following format:
 1
0 1
1 0 1
 0 1 0 1
2. C# program for boxing and unboxing.
3. C# program for properties.
4. C# program for inheritance.
5. C# program for the different parameter passing methods.
6. C# program for delegate.
7. C# program for the preparation of menu card.
8. C# program to implement the various user interfaces.
9. C# program for base class constructor.
10. C# program for operator overloading.
11. C# program for window application.
12. C# program for pascal triangle.
13. C# program for class and object.
14. C# program for method overloading and overriding.
15. C# program for user and pre-defined exception.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Class : B.Sc. IT **Part III : Core**

Semester : VI **Hours : 06**

Subject Code : 18UITPR1 **Credits : 05**

PROJECT AND VIVA – VOCE

Course Outcomes

CO1: The Project Lab is one that involves practical work for understanding andsolving problems in the field of computing.

CO2: Students will select individually commercial or Technical Project based onApplication Development Technologies.

CO3: With the known technologies they can develop the software

Course Description

The Project is conducted by the following Course Pattern.

Internal

Presentation Submission	**40**

External

Project Report Viva Voce	**60**
Total	**- 100**

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme : B.Sc(IT) **Part III : Elective**
Semester : VI **Hours : 05**
Sub Code : 18UITE61 **Credits : 04**

E- COMMERCE

Course Outcomes:

On the successful completion of the course, learners should be able to:

CO1: Understand the basic concepts of E-Commerce and its uses.

CO2: Analyzing network infrastructure and security systems.

CO3: Analyze the impact of E-Commerce on business models and strategy.

CO4: Assess electronic payment systems,

CO5: Distinguish various E-Commerce trading relationships.

UNIT- I

Foundation of E – Commerce: Foundation of E - Commerce - Business to Consumer (B2C) Electronic Commerce – Business to Business (B2B) Electronic commerce.

UNIT- II

Network Infrastructure for E – Commerce: Network Infrastructure E - Commerce -The Internet, Intranets and Extranets as E - Commerce Infrastructure.

UNIT- III

Web security: Web security - Cryptography – Firewall.

UNIT- IV

Electronic Payment Systems: Electronic Payment Systems**.**

UNIT-V

Mobile commerce: Mobile commerce – WAP (Wireless ApplicationProtoco l) - Legal Requirements in E –Commerce.

Text Book:

1. Mamta Bhusry, **E – Commerce,** Firewall Media (An Imprint of Laxmi Publications Pvt. Ltd), New Delhi, Second Edition, 2005.

   Unit I : Chapters 1, 2, 3.

   Unit II : Chapters 4, 5.

   Unit III : Chapters 6, 7, 8.

   Unit IV : Chapters 9.

   Unit V : Chapters 10, 11, 12.

Reference Books:

1. P.T.Joseph, S.J, **E - Commerce**, Prentice Hall of India Pvt Ltd, New Delhi, Third Edition, 2008.
2. Pete Loshin, John Vacca, **Electronic Commerce**, Firewall Media (An Imprint of Laxmi Publications Pvt.Ltd.), New Delhi, Fourth Edition, 2004.

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Class : B.Sc (IT) **Part III : Elective**
Semester : VI **Hours : 05**
Subject Code : 18UITE62 **Credits : 04**

MOBILE COMPUTING

Course Outcomes:

On Successful Completion of this Course, the learners should be able to:

CO1 Explain the principles and theories of mobile computing technologies.
CO2 Describe infrastructures and technologies of mobile computing.
CO3 Use of Wireless application Protocol (WAP) in mobile computing .
CO4 Importance of GSM Architecture and GPRS in mobile computing.
CO5 Apply CDMA and 3Generation networks.

Unit I

Introduction: Mobility of Bits and Bytes-Wireless The Beginning- Mobile Computing-Dialogue Control-Networks-Middleware and Gateways-Application and Services-Developing Mobile Computing Applications-Security in Mobile Computing-Standards-Why are they Necessary?-Standards Bodies-Players in the Wireless Space.

Unit II

Mobile Computing Architecture: History of Computers-History of Internet- Internet-The Ubiquitous Network-Architecture for Mobile Computing- Three - tier Architecture-Design Considerations for Mobile Computing-Mobile Computing through Internet-Making Existing Applications Mobile-enabled.

Unit III

Global System for Mobile Communications(GSM): Global System for Mobile Communications-GSM Architecture-GSM Entities- Call Routing in GSM-PLMN Interfaces-GSM Addresses and Identifiers-Network Aspects in GSM-GSM Frequency Allocations-Authentication and Security.

Unit IV

General Packet Radio Service (GPRS): Introduction-GPRS and Packet Data Network-GPRS Network Architecture- GPRS Network Operations-Data Services in GPRS-Applications for GPRS-Limitations of GPRS-Billing and Charging in GPRS.

Unit V

Wireless Application Protocol (WAP): Introduction-WAP-MMS-GPRS Applications-**CDMA and 3G:** Introduction- Spread-Spectrum Technology- IS-95- CDMA versus GSM-Wireless Data- Third Generation Networks- Applications on 3G.

Text Book:

1. Asoke k Talukder, Hasan Ahmed, Roopa R Yavagal, **Mobile Computing, Technology, Applications and Service Creation**, TMH Publishing Company, New Delhi, Second Edition 2010.

Unit I Chapters - 1
Unit II Chapters – 2
Unit III Chapters – 5.1 To 5.7, 5.9, 5.11
Unit IV Chapters – 7.1 To 7.8
Unit V Chapters – 8.1 To 8.4, 9.1 To 9.7

Reference Books:

1. Tomasz Imielinski, Henry F. Korth Springer, **Introduction to Mobile Computing,** Murray Hill, US,1996.

2. Jochenschiller, **Mobile Communication,** Pearson, New York, 2nd Edition, 2003.

Websites:

1.https://geekflare.com/learn-cloud-computing/

2. https://publish.illinois.edu/mobilecomputing/websites/

3. https://www.edx.org/learn/cloud-computing

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme : B.Sc (IT) **Part III : Elective**
Semester : VI **Hours : 05**
Sub Code : 18UITE63 **Credits : 04**

ARTIFICIAL INTELLIGENCE

Course Outcomes:

On Successful Completion of this Course, the learners are able to

CO1 Describe the concept of Artificial Intelligence.
CO2 Analyze the search techniques and knowledge representation.
CO3 Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
CO4 Acquire knowledge to solve problems in areas ranging from optimization Problems to text analytics.
CO5 Learn the purpose of heuristic search techniques.
CO6 Use different machine learning techniques to design AI machine and enveloping applications for real world problems.

Unit I

What is Artificial Intelligence?: The AI problems- The Underlying Assumption- What is an AI technique?-The Level of the Model-Criteria for Success, **Problems, Problem Spaces and Search:** Defining the Problem as a State Space Search-Production Systems, Problem Characteristics, Production System Characteristics, Issue in the Design of Search Programs.

Unit II

Heuristic Search Techniques: Generate and Test, Hill Climbing, Best – First Search, Problem Reduction, Constraint Satisfaction, Means – Ends Analysis.

Unit III

Knowledge Representation Issues: Representation and Mappings – Approaches to Knowledge Representation, Issues in Knowledge Representation -The Frame Problem-**Using predicate Logic:** Representing Simple Facts in Logic-RepresentationInstance and ISA Relationships, Computable Functions and Predicates- Resolution-Natural Deduction.

Unit IV

Representing knowledge using Rules: Procedural Versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning- Matching -Control Knowledge.

Unit V

Symbolic Reasoning Under Uncertainty: Introduction to Nonmonotonic Reasoning – Logic for Nonmonotonic Reasoning- Implementation Issues – Augmenting Problem Solver Implementation of DFS- Breadth–First search.

Text Book:

1. Elaine Rich, Kevin Knight, **Shivashankar B Nair, Artificial Intelligence,** Tata McGraw Hill Ltd, New Delhi, Third edition, 2009.

Unit I	:	Chapters 1 – Section 1.1 – 1.5.
		Chapter 2– Section 2.1, 2.5
Unit II	:	Chapter 3 – Section 3.1 –3.6
Unit III	:	Chapter 4 – Section 4.1 – 4.4.
		Chapter 5 – Section 5.1–5.5
Unit IV	:	Chapter 6 – Section 6.1 – 6.5
Unit V	:	Chapter 7 – Section 7.1 – 7.6

Reference Books:

1. Stuart J.Russell and Peter Norvig, **Artificial Intelligence: A Modern Approach**, Pearson Education, New Delhi, Second Edition, 2009.
2. Simon Haykin, **Neural Networks and learning Machines**, Prentice Hall, New Delhi, Third Edition, 2008.
3. www.techopedia.com/definition/190/artificial-intelligence-ai.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Class : B.Sc(IT) **Paper III : Elective**
Semester : VI **Hours :05**
Sub.Code : 18UITE64 **Credits :04**

DATA MINING AND WAREHOUSING

Course Outcomes:

On successful completion of this course, the learners should be able to:

CO1: Visualize data mining principles and techniques
CO2: Discover the knowledge imbibed in the high dimensional system.
CO3: Illustrate algorithms for finding the hidden interesting patterns in data.
CO4: Determine the overview of developing areas – Web mining, Text mining and Big Data
Mining Tools

CO5: Analyzethe concepts of Data warehousing Architecture and implementation.
CO6 Develop research interest towards advances in data mining.

UNIT I

Data Warehousing: Introduction – Data Warehouse Architecture – Dimensional Modeling – Categorization of Hierarchies – Aggregate Function.

UNIT II

Data Mining: What is Data Mining? Data Mining: Definitions – KDD vs. DataMining – DBMS vs. DM – Other Related Areas – DM Techniques – Other MiningProblems – Issues and Challenges in DM – DM Application Areas – DMApplications – Case Studies – Association Rules: Apriori Algorithm – Partition Algorithm – Pincer Search Algorithm – Border Algorithm.

UNIT III

Clustering Techniques: Clustering Paradigms – Partitioning Algorithms – K-Medoid Algorithms - CLARA – CLARANS – Hierarchical Clustering- DBSCAN –Categorical Clustering Algorithm – STIRR.

UNIT IV

Decision Trees: Tree Construction Principle – Best Split – Splitting Indices –Splitting Criteria – Decision Tree Construction Algorithms – CART – ID3. GeneticAlgorithm: Basic Steps of GA - Other Techniques – What is a Neural Network –Support Vector Machines.

UNIT V

Web Mining: Introduction - Web Mining– Web Content Mining – Web StructureMining – Web Usage Mining – Text Mining – Hierarchy of Categories – TextClustering.

Text Book:

1. Arun K. Pujari, Data Mining Techniques, Universities Press, Hyderabad, ThirdEdition, 2013.

Units Chapters

Unit I Chapter 2 - Section: 2.1 To 2.5

Unit II Chapter 3 – Section 3.2 To 3.11

Chapter 4 - Section: 4.4 To 4.6, 4.13

Unit III Chapters 5 - Section: 5.2 To 5.8, 5.11, 5. 12.

Unit IV Chapters 6 - Section: 6.3 To 6.9.

Chapters 8 - Section: 8.2.

Chapters 9 - Section: 9.2, 9.6.

Unit V Chapter 10 - Section: 10.1 To 10.6, 10.9, 10.10

Reference Books:

1. M. H. Dunham, Data Mining: Introductory and Advanced Topics, Pearson Education, New Delhi, 2001.
2. D. Hand, H. Mannila and P. Smyth, Principles of Data Mining, Prentice Hall, New Delhi, 2001.

MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme : B.Sc(IT) **Part III : Elective**
Semester : VI **Hours : 05**
Subject code : 18UITE65 **Credits: 04**

CLOUD COMPUTING

Course Outcomes:
On successful completion of this course, the learners should be able to:
CO1: Define Cloud Computing model and classify its types.
CO2: Apply virtualization techniques in cloud environment to construct porting applications.
CO3: Analyze the various services in the cloud computing to connect the user into network.
CO4: Evaluate the various security attacks to provide the secure data in the cloud environment.
CO5: Build the customize applications in the clouds by using cloud APIs.

Unit I

Define cloud Computing: Defining Cloud Computing – Cloud types –The NIST model, the cloud cube model, Deployment models, Service models, Characteristics of cloud computing-merits and demerits of cloud computing.

Unit II

Understanding Cloud Architecture: Cloud computing stack: composability – Infrastructure – platforms - Virtual appliances - Communication protocols – Applications. **Understanding Services and Applications by Type:** DefiningIaaS(Infrastructure as a Service) – Defining Platform as a Service(PaaS) – Defining Software as a Service(SaaS) – Defining Identity as a Service(IDaas) – Defining Compliance as a Service(CaaS)

Unit III

Understanding Abstraction and Virtualization: Using Virtualization Techniques – Load balancing and Virtualization – Understanding Hypervisors – Porting Applications

Unit IV

Exploring Platform as a Service: Defining services - Using PAAS application frameworks-**Using Google Web services:** Exploring Google Applications – Surveying the Google Application Portfolio – Exploring the Google Toolkit – Working with the Google App Engine.

Unit V

Understanding Cloud Security: Securing the Cloud- Securing Data – Establishing Identity and Presence – **Moving Applications to the Cloud**: Applications in the Clouds – Applications and cloud APIs.

Text Book:

1. Barrie Sosinsky, "**Cloud Computing Bible"**, Wiley, India 2014.

   Unit 1: Chapter 1

   Unit 2: Chapter 3, 4

   Unit 3: Chapter 5

   Unit 4: Chapter 7, 8

   Unit 5: Chapter 12, 14

Reference Books:

1. Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, "**Cloud Computing: Principles and Paradigms**", Wile, 2011.
2. Antony T Velte, "**Cloud Computing: A Practical Approach**", McGraw Hill, 2009.

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DEPARTMENT OF INFORMATION TECHNOLOGY
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Programme : BSc. (IT) **Part III : Elective**
Semester : VI **Hours : 05**
Subject Code: 18UITE66 **Credits : 04**

INTERNET OF THINGS

Course Outcomes

On successful completion of this course, the learners should be able to:

CO1: Describe and explain about IoT, Physical and Logical design of IoT, IoT levels, domain Specific IoTs

CO2: Determine physical and logical design of IoT

CO3: Compare Physical and Logical IoT, different levels and domain specific IoTs

CO4: Conclude the importance of IoT, Physical and Logical IoT, IoT levels, domain specific IoTs

CO5: Design and develop Physical and Logical IoT, IoT deployment templates

Unit I

Introduction to Internet of things: Introduction to Internet of things– Definition & Characteristics of IoT - **Physical Design of IoT** – Things in IoT - IoT protocols. **Logical Design of IoT :** IoT Functional blocks- IoT communication Models- IoT communication APIs. **IoT Enabling Technologies**– Wireless Sensor Networks- Cloud Computing- Big data Analysis – Communication Protocols – Embedded systems.

Unit II

IoT Levels & Deployment Templates: IoT Level-1 IoT Level-2 IoT Level -3 IoT Level-4 IoT Level-5 IoT Level -6. IoT physical devices and endpoints- What is an IoT device – Basic building blocks of an IoT Device.

Unit III

Domain Specific IoTs: Introduction – Home Automation- Smart Lighting- Smart Appliances- Intrusion Detection-Smoke/ Gas Detectors. **Cities**– Smart Parking- Smart Lighting- Smart roads– Structural Health Monitoring – Surveillance – Emergency Response. **Environment –** Weather Monitoring- Air Pollution Monitoring - Noise Pollution Monitoring - Forest Fire Detection – River Floods Detection Energy- Re- Logistics-Agriculture.

Unit IV

IoT and M2M : Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT – Software Defined Networking – Network Function Virtualization – **IoT System Management with NETCONF – YANG** – Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Limitations of SNMP – Network Operator Requirements – NETCONF – YANG – IoT Systems Management with NETCONF – YANG.

Unit V

IoT Platforms Design Methodology : Introduction - IoT Design Methodology **–** Introduction – IoT Design Methodology **–** Purpose and Requirements Specification – Process Specification – Domain Model Specification – Information Model Specification – Service Specifications – IoT Level Specification – Functional View Specifications – Operational View Specifications – Device & Component Integration – Application Development

Text Book:

1. Arshdeep Bahga , Vijay Madisetti, **Internet of Things -** A Hands on Approach University Press (India)Private Limited, New Delhi,2014
   Unit I : Chapter 1: 1.1-1.2, 1.3-1.4.
   Unit II : Chapter 1 & 7: 1.5,7.1
   Unit III: Chapter 2 : 2.1 – 2.10
   Unit IV: Chapter 3 &4 : 3.1-3.4, 4.1-4.6.
   Unit V : Chapter 5 : 5.1 – 5.3

Reference Books:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1 st Edition, Academic Press, 2014.
2. Francis da Costa, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1 st Edition, A Press Publications, 2013.

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DEPARTMENT OF INFORMATION TECHNOLOGY
(For those who joined in 2018-2019 and after)

Programme : B.Sc (IT) **Part IV : Skill**
Semester : VI **Hours : 02**
Subject Code : 18UITS61 **Credits : 02**

NUMERICAL APTITUDE

Course Outcomes

On successful completion of this course, the learners should be able to:

CO1: Understanding the number system, logarithms, linear equations, Permutations and Combinations.

CO2: Practicing the number system, techniques for fractions and to be familiar with arithmetic ability

CO3: Manipulation on modern Mathematics and reasoning.

CO4: Interpretation of arithmetic and algebraic functions.

CO5: Application and Evaluation of numerical ability.

Unit - I:

Numbers: Numbers- HCF- LCM of Numbers- Decimal Fractions- Square root and cube root – Average- Problem on numbers- Surds.

Unit -II:

Arithmetic: Percentages- Profit & Loss- Simple Interest and Compound Interest.

Unit -III:

Arithmetic: Time and Distance- Time and Work-Clocks- Calendars.

Unit -IV:

Algebra: Logarithms- Problems on age.

Unit -V:

Modern Mathematics: Permutations- Combinations.

Text Book:

1. R.S. Agarwal, Quantitative Aptitude for Competitive Examinations, S. Chand Limited, New Delhi, 2011.

   Unit I : Chapter 1, 2, 3, 5, 6, 7, 9.

   Unit II : Chapter 10, 11, 21, 22.

   Unit III : Chapter 15, 17, 27, 28.

   Unit IV : Chapter 8, 23.

   Unit V : Chapter 30.

Reference Books:

1. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, TMH, New Delhi, 4th Edition, 2011.

2. Arun Sharma, How to prepare for Quantitative Aptitude for the CAT, TMH, NewDelhi, 2011.