

B.Sc., COMPUTER SCIENCE

Syllabus

Program Code: UCS

2018- Onwards



MANNAR THIRUMALAI NAICKER COLLEGE

(AUTONOMOUS)

Re-accredited with "A" Grade by NAAC

PASUMALAI, MADURAI – 625 004

Eligibility for Admission

Candidates seeking admission to the B.Sc Degree course must have the Higher Secondary Education, (should have studied Computer Science and Mathematics in HSC) of the Government of Tamil Nadu or any other state or its equivalent qualification.

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 x 01= 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 x 01 = 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	<u>--10 marks*</u>
Total	<u>--25 marks</u>

** 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 each unit (One question from each Unit) 3 x 15 = 45 Marks

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.

PROGRAMME EDUCATION OUTCOMES (PO)

PEO1: Effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation.

PEO2: Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.

PEO3: Graduates are trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.

PEO4: Showing continuous improvement in their professional career through lifelong learning, appreciating human values and ethics.

PROGRAMME OUTCOMES (PO)

The computer Science graduate will be able to

PO1: Apply knowledge of computing and mathematics appropriate to the discipline and to provide effective solution in the area of computing.

PO2: Function effectively on teams to accomplish shared computing design, evaluation, or implementation goals.

PO3: Capable of adapting to new technologies and constantly upgrade their skills with an attitude towards independent and problem solving.

PO4: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO5: Understand and commit to professional ethics and cyber regulations, responsibilities and norms of professional computing practice.

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: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PROGRAMME SPECIFIC OUTCOMES

PSO1 : To understand the principles and working of computer systems. Students can assess the hardware and software aspects of computer systems.

PSO2 : To understand the structure and development methodologies of software systems. Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms.

PSO3 : To apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm.

PSO4 : To investigate and evaluate new technologies and make recommendations with respect to their application. Appreciate the importance of new and emerging technologies, and the strategies available for life-long learning.

DEPARTMENT OF COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)
COURSE PATTERN

Study Component	I Sem	II Sem	III Sem.	IV Sem.	V Sem	VI Sem	Total Hrs/week	Total Credit	No.of Papers	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 Subjects/	5(4) 5(4)	5(5) 5(5)	5(5) 5(5)	5(4) 5(4)	6(5) 6(5) 6(4)	6(5) 6(4) 6(4)	76	63	14	1400
Elective					5(4) 5(4)	5(4) 5(4)	20	16	4	400
Allied Subject	4(4)	4(4)	4(4)	4(4)			16	16	4	400
Part – IV										
Skill Based Subjects/	2(2)	2(2)	2(2)	2(2)	2(2)	2(2)	12	12	6	600
EVS/VE/	2(2)	2(2)					4	4	2	200
NME			2(2)	2(2)			4	4	2	200
Part – V										
Extension Activities				0(1)			0	1	1	100
Total	30 (22)	30 (24)	30 (24)	30 (23)	30 (24)	30 (23)	180	140	41	4100

SEMESTER – I

Subject Code	Title of the Paper	No. of Papers	Hours / week	Credits	Maximum Marks		
					Internal	External	Total
18UTAG11	பகுதி-Iதமிழ் தற்கால கவிதையும் உரைநடையும்	1	6	3	25	75	100
18UENG11	English-I: Exploring Language Through Literature-I	1	6	3	25	75	100
18UCSC11	Part III: Core Subject Programming in C	1	5	4	25	75	100
18UCSCP1	Programming in C - Lab	1	5	4	40	60	100
18UCSA11	Part III: Allied Subject Discrete Mathematics	1	4	4	25	75	100
18UCSSP1	Part IV : Skill Subject PC Software - Lab	1	2	2	40	60	100
18UEVG11	Part IV: Mandatory Subject Environmental Studies	1	2	2	25	75	100
	Total	6	30	22	205	495	700

SEMESTER - II							
Subject Code	Title of the Paper	No. of Papers	Hours / week	Credits	Maximum Marks		
					Internal	External	Total
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
18UCSC21	Part III: Core Subject Data Structures and C++ Programming	1	5	5	25	75	100
18UCSCP2	Data Structures and C++ Programming - Lab	1	5	5	40	60	100
18UCSA21	Part III: Allied Subject Statistical and Numerical Methods	1	4	4	25	75	100
18UCSSP2	Part IV : Skill Subject Photoshop- Lab	1	2	2	40	60	100
18UVLG21	Part IV: Mandatory Subject Value Education	1	2	2	25	75	100
	Total	7	30	24	205	495	700

SEMESTER – III							
Subject Code	Subject	No.of Papers	Hours/ Week	Credits	Maximum Marks		
					Int	Ext.	Tot.
18UTAG31	Part I: Tamil காப்பிய இலக்கியமும் சிறுகதையும்	1	6	3	25	75	100
18UENG31	Part II: English Exploring Language Through Literature-III	1	6	3	25	75	100
18UCSC31	Part III: Core Subject Programing in Java	1	5	5	25	75	100
18UCSCP3	Programing in Java – Lab	1	5	5	40	60	100
18UCSA31	Part III: Allied Subject Operations Research	1	4	4	25	75	100
18UCSSP3	Part IV: Skill Subject Android Application Development– Lab	1	2	2	40	60	100
18UCSN31	Part IV: Non-Major Elective Web Programing- Lab	1	2	2	40	60	100
	Total	7	30	24	220	480	700

SEMESTER – IV							
Subject Code	Subject	No.of Papers	Hour s/ Week	Credits	Maximum Marks		
					Int.	Ext.	Tot.
18UTAG41	Part I: Tamil பழந்தமிழ் இலக்கியமும் புதினமும்	1	6	3	25	75	100
18UENG41	Part II: English Exploring Language Through Literature-IV	1	6	3	25	75	100
18UCSC41 18UCSCP4	Part III: Core Subject Programming in PHP Programming in PHP – Lab	1 1	5 5	4 4	25 40	75 60	100 100
18UCSA41	Part III: Allied Subject Numerical Aptitude	1	4	4	25	75	100
18UCSSP4	Part III: Skill Subject Web Designing – Lab	1	2	2	40	60	100
18UCSN41	Part IV: Non-Major Elective Multimedia- Lab	1	2	2	40	60	100
18UEAG40- 18UEAG49	Extension Activities	1	0	1	-	100	100
	Total	8	30	23	320	480	800

SEMESTER – V							
Subject Code	Title of the Paper	No. Of Courses	Hrs / Week	Credits	Maximum Marks		
					INT.	EXT.	TOT
18UCSC51	Part –III Core Subject Computer Networks	1	6	5	25	75	100
18UCSC52	Relational Data Base Management System	1	6	5	25	75	100
18UCSCP5	Relational Data Base Management System - Lab	1	6	4	40	60	100
	Core Elective –I						
18UCSE51	Operating System	1	5	4	25	75	100
18UCSE52	Data Mining	1	5	4	25	75	100
18UCSE53	System Software	1	5	4	25	75	100
	Core Elective –II						
18UCSE54	Cryptography and Network Security	1	5	4	25	75	100
18UCSE55	Artificial Intelligence	1	5	4	25	75	100
18UCSE56	Internet of Things	1	5	4	25	75	100
18UCSSP5	Part IV : Skill Subject Linux 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
	Part-III Core Subject						
18UCSC61	C# and.Net Programming	1	6	5	25	75	100
18UCSCP6	C# and .Net Programming – Lab	1	6	4	40	60	100
18UCSPR1	Project and Viva-Voce	1	6	4	40	60	100
	Core Elective-III						
18UCSE61	Software Engineering	1	5	4	25	75	100
18UCSE62	Software Project Management	1	5	4	25	75	100
18UCSE63	Mobile Computing	1	5	4	25	75	100
	Core Elective-IV						
18UCSE64	Cloud Computing	1	5	4	25	75	100
18UCSE65	Biometrics	1	5	4	25	75	100
18UCSE66	Neural Networks	1	5	4	25	75	100
	Part IV : Skill Subject						
18UCSSP6	Python Programming - Lab	1	2	2	40	60	100
	Total	6	30	23	195	405	600

FIRST SEMESTER



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

Programme : B.Sc (CS)
Semester : I
Subject Code: 18UCSC11

Part III : Core
Hours : 05
Credits : 04

PROGRAMMING IN C

Course Outcomes:

- CO1:** To know about the fundamentals and basics of C language.
- CO2:** To impart the knowledge about pointers which is the backbone of effective memory handling.
- CO3:** To study the advantages of user defined data type which provides flexibility for application development.
- CO4:** This course provide the student to built the basic programming skills.

Unit -I:

Overview of C and Data types :History of C – importance of C – character set – C tokens – keywords and identifiers – constants – variables – data types – declaration of variables – defining symbolic constants – declaring variable as constants - operators – managing input and output operations: Reading and writing Character.

Unit -II:

Decision Making and Branching: Introduction – simple if – else...If – nested if – ladder if – switch statement – conditional operators – goto statements – while statement – do...While statement – for statement.

Unit-III:

Arrays and Strings: Introduction – one dimensional array – Declaration of one Dimensional array – initialization of one dimensional arrays – two dimensional arrays – initializing two dimensional arrays - multi dimensional array – declaring and initializing string variables – reading and writing strings-String handling Functions.

Unit -IV:

Function and Structures: Introduction to functions – Need for user defined functions – definition of a function – 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 – recursion –

Introduction to Structure and Unions – defining and declaring a structure variables – accessing structure members – arrays of structures – structures and functions– unions–size of structures –bit fields.

Unit -V:

Pointers and File Management: Introduction to pointers – understanding pointers – Accessing the address of a variable - declaring and initializing of pointer variables- Introduction to file – defining and opening a file – closing a file – input/output operations on files- error handling during I / O operations- Random access to files- Command line arguments.

Text Book :

1. E.Balagurusamy, **Programming in ANSI C**, Tata McGraw Hill Education Private Limited, Sixth Edition, New Delhi, 2012.

Unit I – Chapter 1 – Section : 1.1, 1.2,
Chapter 2 – Section : 2.1 to 2.8, 2.11, 2.12
Chapter 3 – Section : 3.1-3.9
Chapter 4 – Section : 4.1- 4.5

Unit II – Chapter 5 – Section : 5.1 -5.9
Chapter 6 – Section : 6.1-6.4

Unit III – Chapter 7 – Section : 7.1 -7.7
Chapter 8 – Section : 8.1-8.4 ,8.8

Unit IV – Chapter 9 – Section : 9.1, 9.2, 9.5, 9.7, 9.8, 9.9 -9.13, 9.16
Chapter 10 – Section: 10.1 - 10.4, 10.8, 10.11-10.14

Unit V – Chapter 11 – Section : 11.1 -11.5
Chapter 12- Section :12.1-12.7

Reference Books:

1. Byron Gottfried, **Programming with C**, McGraw Hill Education (India) Private Limited, New Delhi, Third Edition, 2014.
2. Yashavant Kanetkar, **Let Us C**, BPB Publications, New Delhi, Tenth Edition, 2010.
3. Brain W.Kernigham & Dennis Ritchie, **C Programming**, Prentice Hall, Second Edition, 1988.
4. WEBSITE : <https://www.spoken-tutorial.org>



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Programme : B.Sc (CS)	Part III :
Core	
Semester : I	Hours : 05
Subject Code : 18UCSCP1	Credits : 04

PROGRAMMING IN C –Lab

Course Outcomes:

- CO1:** The purpose of this course is to introduce to students to the field of programming using C language.
- CO2:** The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C language.
- CO3:** Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- CO4:** This course provide the student to built the basic programming skills.

1. Simple interest calculation
2. Find the biggest from two numbers-ordinary /switch case/conditional operator methods.
3. Find the biggest from three numbers.
4. Check the given number is odd or even –ordinary/switch case/conditional operator methods.
5. Prime number checking.
6. Print all prime numbers between any two given limit.
7. Check the given character is vowels or not.
8. Perform various arithmetic operations using switch case.
9. Find the sum of digits of a given number.
10. Binary to decimal-Decimal to binary conversion.
11. Display the PASCAL’S triangle.

Arrays:

1. Arrange -n numbers in ascending and descending order.
2. Arrange -N strings in alphabetical order.
3. Palindrome checking.
4. Matrix addition/ subtraction/multiplication.

Function and structure:

1. Calculate the factorial value by recursion.
2. Reverse a string by recursion.
3. Mark list processing- array of structures.
4. EB bill calculation – array of structures.

Files:

1. Create a data file to store N numbers and separate odd and even numbers.
2. Create a data file to store characters and separate vowel and non-vowels.



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Programme : B.Sc (CS)
Semester : I
Subject Code : 18UCSA11

Part III : Allied
Hours : 04
Credits : 04

DISCRETE MATHEMATICS

Course Outcomes:

- 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 to Graph 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. Seymour Lipchitz, **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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Programme : B.Sc (CS)
Semester : I
Subject Code : 18UCSSP1

Part IV : Skill
Hours : 02
Credits : 02

PC Software – Lab

CourseOutcomes:

- CO1:** To become productive by acquiring a basic understanding of Microsoft Word, Microsoft Excel, Microsoft Access and Microsoft PowerPoint and learn to share data between these applications.
- CO2:** To familiarize the students in preparation of documents and presentations with office automation tools.
- CO3:** Provide hands-on use of Microsoft Office 2013 applications Word, Excel, Access and PowerPoint. Completion of the assignments will result in MS Office applications knowledge and skills.
- CO4:** This course will provide the student with good opportunities in desktop publishing job.

MS – Word

1. Preparing a Leave Letter.
2. Designing your Bio-Data
3. Create the Time Table.
4. Create Mail Merge.
5. Advertisement Designing.

MS – Excel

1. To find Mean and Median.
2. Perform Student's Mark statement.
3. Display Score boards using Pie Charts.
4. Display Sales Analysis using Bar Charts.

MS – Access

1. Create an Employee table.
2. Create a Stock Table and insert 10 records.
3. Create Student Mark list.

MS – PowerPoint

1. Slide show presentation for your Bio data.
2. Displaying College details.
3. Displaying Advertisement Presentation.



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Programme : B.Sc (CS)
Semester : I
Subject Code :18UEVG11

Part IV : Mandatory
Hours : 02
Credits : 02

ENVIRONMENTAL STUDIES

COURSE OUTCOMES	
<p>CO1:To gain knowledge on the importance of environmental education and ecosystem.</p> <p>CO2:To acquire knowledge about environmental pollution- sources, effects and control measures of environmental pollution</p> <p>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</p> <p>CO4: To make the student to understand the various pollution problems control mechanisms.</p>	
UNIT I	<p>: 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.</p> <p>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.</p>
UNIT II	<p>: Ecology and Ecosystems: Ecology – Meaning - Definition – Scope – Objectives – Subdivisions of Ecology.</p> <p>Ecosystem–Concept - Structure - Functions – Energy Flow – Food Chain and Food Web – Examples of Ecosystems (Forest, Grassland, Desert, Aquatic).</p>
UNIT III	<p>: Biodiversity: Definition – Biodiversity at Global, National and Local Level. Values of Biodiversity – Threats to Biodiversity – Conservation of Biodiversity.</p> <p>Biodiversity of India:Biogeographical Distribution – Hotspots of Indian Biodiversity – National Biodiversity Conservation Board and Its functions. Endangered and Endemic Species of India</p>
UNIT IV	<p>: Pollution Issues: Definition – Causes – Effects and Control Measures of Air, Water, Soil, Marine, Noise, Thermal and Nuclear Pollutions.</p> <p>Global Issues: Global Warming and Ozone Layer Depletion. Future plans of Global Environmental Protection Organisations.</p>
UNIT V	<p>: Sustainable Development:Key aspects of Sustainable Development – Strategies for Sustainable Development - Agriculture – Organic farming – Irrigation – Water Harvesting – Water Recycling – Cyber Waste and Management.</p> <p>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 -</p>

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 Studies for 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 COMPUTER SCIENCE
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Programme : B.Sc (CS)	Part III : Core
Semester : II	Hours : 05
Subject Code : 18UCSC21	Credits : 05

DATA STRUCTURES AND C++ PROGRAMMING

Course Outcomes:

- CO1:** To learn how C++ supports Object Oriented principles such as abstraction, polymorphism etc.
- CO2:** To understand the linear and non linear data structures available in solving problems.
- CO3:** Using the data structures and algorithms in real time applications.
- CO4:** This will improve the domain skill about organizing data and efficient implementation of data structure

Unit-I :

Basic concepts of object oriented programming –benefits of oops –application of oops-Beginning with C++: A simple c++ program - structure of c++ program – Tokens, Expressions and Control Structures: basic data types – user defined data types – derived data type- operators in c++- control structures.

Unit -II :

Function in C++: The Main Function-inline function –function overloading-specifying a class-defining member function –nesting of member function-arrays of objects – friendly functions – constructors – parameterized constructors –copy constructor – destructors.

Unit -III :

Defining operator overloading- overloading unary operators-overloading binary operators-rules for operator overloading-inheritance-single inheritance-multilevel inheritance-multiple inheritance-hierarchical inheritance-virtual base classes – introduction – pointers-pointers to objects-this pointer-virtual functions-pure virtual functions.

Unit -IV:

Sorting: Bubble Sort – Searching Linear search-Binary search-Stacks-Array Representation of Stacks-Linked Representation of Stacks-Recursion-Queues.

Unit -V :

Trees –introduction –binary trees-representing binary trees in Memory- traversing Binary trees.

Text Books:

1. E. Balagurusamy, **Object Oriented Programming with C++**, McGraw Hill Education (India) Private Limited, New Delhi, Sixth Edition, 2014.

Unit I : Chapter 1 – Sections : 1.5,1.6,1.8
Chapter 2 – Section : 2.3,2.6
Chapter 3 – Sections : 3.5,3.6,3.8,3.14,3.25

Unit II : Chapter 4 – Sections : 4.2,4.6,4.10
Chapter 5 – Sections : 5.3,5.4,5.7,5.13,5.15
Chapter 6 – Sections : 6.2,6.3,6.7,6.11

Unit III : Chapter 7 – Sections : 7.2,7.3,7.4,7.8
Chapter 8 – Sections : 8.3,8.5,8.6,8.7,8.9
Chapter 9 – Sections : 9.1,9.2,9.3,9.4,9.6,9.7

2. Seymour Lipschultz, **Data Structure**, Tata McGraw-Hill Education Private Limited, New Delhi, Twentieth Reprint, 2011.

Unit IV : Chapter 4 – Sections :4.6,4.7,4.8.
Chapter 6 – Sections : 6.2,6.3,6.4,6.7,6.10

Unit V : Chapter 7 – Sections : 7.1,7.2,7.3,7.4.

Reference Books

1. D.Ravichandran, **Programming with C++**, Tata McGraw Hill Education (India) Private Limited, New Delhi,Sixth Reprint, 2005 .
2. Joyce Farrell, **OOP Using C++**, Cengage Learning, 4thEdition, 2013.
3. A. Chitra, PTRajan, **Data Structure**, Tata McGraw-Hill Education (India)) Private Limited, New Delhi, Fifth Reprint, 2011 .



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

Programme : B.Sc (CS)
Semester : II
Subject Code: 18UCSCP2

Part III : Core
Hours : 05
Credits : 05

DATA STRUCTURES AND C++ PROGRAMMING - Lab

Course Outcomes:

CO1: To learn practical knowledge about Object Oriented principles such as abstraction, polymorphism etc.

CO2: To understand the linear and non linear data structures available in solving problems.

CO3: Using the data structures and algorithms in real time applications.

CO4: This will improve the domain skill about organizing data and efficient implementation of data structure

1. Conversion of Fahrenheit and Celsius using class.
2. Calculate multiplication and division using inline function.
3. Perform area calculation the function overloading
4. Print the employee details using Arrays of object.
5. Swapping of two numbers using friend function.
6. Change the sign using overloading unary minus
7. Overload binary + operator this adds two complex numbers.
8. Calculate BMI using single inheritance
9. Generate salary bill using multiple inheritance.
10. Calculate square and cube of a number using hierarchical inheritance.
11. Process Student Mark list Multilevel inheritance.
12. Print the Student Mark list using Virtual Base class.
13. Sort N numbers using Bubble Sort.
14. Search an element using Linear Search
15. Search an element using Binary Search.
16. Perform stack operations using Array.
17. Perform stack operations using Linked List.
18. Print Fibonacci series using Recursion.
19. Perform queue operations using Array.
20. Traversal of Tree.



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

Programme : B.Sc (CS)
Semester : II
Subject Code : 18UCSA21

Part III : Allied
Hours : 04
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 numbers and Curve fitting (all types of curves)

Unit - IV

Errors in Numerical Computation – Iteration method – Bisection method – Regula-falsi 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 COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme : B.Sc (CS)
Semester : II
Subject Code : 18UCSSP2

Part IV : Skill
Hours : 02
Credits : 02

PHOTOSHOP-Lab

Course Outcomes:

CO1: To educate student about designing software practically

CO2: To make them learn a job oriented course.

CO3: To make student learn image editing and Animation.

CO4: To improve the design skills for the students.

1. Simple Image Editing.
2. Color change, image extraction and merging images.
3. Smoothing of sharp edges.
4. Text on images.
5. Remove red eyes.
6. Working with Layers.
7. Filter and layers.
8. Pop Art.
9. Old halftone print Effect.
10. Adding comic element to the picture.
11. Masking and Color Techniques
12. Drop shadow layer style.
13. Blending Images
14. Removing Noises.
15. Full sized and Simplified logos



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

Programme : B.Sc (CS)
Mandatory
Semester : II
Subject Code : 18UVLG21

Part IV :
Hours : 02
Credits : 02

VALUE EDUCATION

COURSE OUTCOMES	
<p>CO1: Clarifying the meaning and concept of value - value education.</p> <p>CO2: To inspire students to develop their personality and social values based on the principles of human values.</p> <p>CO3: Developing sense of Love, Peace and Brotherhood at Local, national and international levels.</p> <p>CO4:To enable the students to understand the social realities and to inculcate an essential value system towards building a health society</p>	
UNIT I	<p>: 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.</p>
UNIT II	<p>: 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.</p>
UNIT III	<p>: 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.</p>

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 COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme : UG	Part III	: Core
Semester : III	Hours per week	: 05
Sub Code : 18UCSC31	Credit	: 05

PROGRAMMING IN JAVA

Course Outcomes:

- CO1:** To identify classes, objects, members of a class and relationships among them needed for a specific problem.
- CO2:** To use the Java programming language for various programming technologies.
- CO3:** To study the advantages of user defined data type which provides flexibility for application development.
- CO4:** Demonstrate the concepts of Polymorphism and Inheritance.

Unit - I

Java Evolution: Java History -Java Features –How Java Differs from C and C++ - Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software requirements – Java Support Systems – Java Environment. **Overview of Java Language**– Simple Java Programs – Java Program Structure – Java Tokens – Java Statement – Implementing a Java Program – Java Virtual Machine – Command Line Arguments – Constants and Variables – Giving Values to Variable – Scope of Variables – Symbolic Constants – Type Casting.

Unit - II

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 Expression – Precedence of Arithmetic Operators – type conversions in Expressions – Operator Precedence and Associativity Mathematical Function. **Decision Making and Branching:** Decision Making with If Statement – Simple If Statement – If-Else Statement – Nesting If-Else Statement – Else If Ladder Statement – Switch Statement –The conditional operators.

Looping Statement: The While Statement – Do Statement– For Statement – Jump in Loops. **Class Object and Methods:** Defining a Class – Field Declaration – Method Declaration – Creating Objects – Accessing Class Members – Method Overloading – Static Member – Nesting of Methods – Inheritance: Extending A Class – Overriding method – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Methods With Variable Args– Visibility Controls.

Unit - III

Arrays, Strings and Vectors: One Dimensional Array – Creating an Array - Two Dimensional Arrays – Strings – Vectors – Wrapper Class – EnumeratedTypes.**Interface:** Define Interfaces- Extending Interfaces– Implementing Interfaces – Accessing Interface Variables.

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

Unit- IV

Multithreaded programming: Creating Thread – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exception – Thread Priority – Synchronization – Implementing the Runnable Interface. **Managing errors and exception:** Types of Errors – Exceptions – Syntax of Exception Handling Code –Multiple Catch Statements - Using Finally Statement – Throwing Our Own Exception – Using Exception for Debugging.**Applet Programming:** How Applet Differ from Applications – Preparing to Write Applet – Building AppletCode – Applet Life Cycle – Creating and Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to Html – Running the Applet.

Unit - V

Graphics Programming:Graphics class – Lines and Rectangle – Circle and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – UsingControlLoops in Applet – Drawing Bar Chart. **Managing input and output in Java:**Concept of Streams – Stream Class – Byte Stream Class – Character Stream Class – Using Stream – Other Useful I/O Class – Using the File Class – Input and Output Exceptions – Creation of Files – Reading/Writing Characters - Reading / Writing Bytes – Random Access File – Interactive Input and Output.

Text Book:

1. Balagurusamy. E., **Programming with Java**, Tata McGraw Hill Private Limited, Fifth Edition, 2016, New Delhi.

Unit I:	Chapters	2 - Section 2.1 -2.9.
	Chapters	3 - Section 3.2, 3.5 to 3.7, 3.9 -3.11.
	Chapters	4 - Section 4.2 , 4.3, 4.6 -4.9.
Unit II:	Chapters	5 - Section 5.2 - 5.15.
	Chapters	6 - Section 6.2 - 6.8.
	Chapters	7 - Section 7.2 - 7.5.
	Chapters	8 - Section 8.2 - 8.6,8.8 – 8.18.

Unit III:	Chapters	9 - Section 9.2 - 9.8.
	Chapters	10 - Section 10.2 - 10.5.
	Chapters	11 - Section 11.2 - 11.10.
Unit IV:	Chapters	12 - Section 12.2 - 12.10
	Chapters	13 - Section 13.2 - 13.7, 13.9.
	Chapters	14 - Section 14.2 - 14.10.
Unit V:	Chapters	15 - Section 15.2 – 15.9 .
	Chapters	16 - Section 16.2 - 16.16.

Reference Books:

1. Radha Krishna.P, **Object Oriented Programming with Java**, University Press India Private Limited, Third Edition, 2008, Hyderabad.
2. Debasish Jana, **Java Object Oriented Programming Paradigm**, Prentice Hall of India Private Limited, Third Edition, 2008, New Delhi.
3. Xavier.C, **Programming with Java**, Scitech Publication India Private Limited, Third Edition, 2004, Chennai.

Online References:

1. <https://www.mooc-list.com/course/object-oriented-programming-java-coursera>
2. https://spoken-tutorial.org/tutorialsearch/?search_foss=Java&search_language=English



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

Programme	: UG	Part III	: Core
Semester	: III	Hours per week	: 05
Sub Code	: 18UCSCP3	Credit	: 05

PROGRAMMING IN JAVA - LAB

Course Outcomes:

- CO1:** To build software development skills using java programming for real world applications.
- CO2:** To develop software in the Java programming language.
- CO3:** To implement complex problems using java programming.
- CO4:** To familiarize the students with the concepts of Graphics.

- 1) Print the values using Command line arguments.
- 2) Calculate Harmonic series for given number.
- 3) Sort the given number using Bubble sort.
- 4) Instantiate Class methods and members.
- 5) Single Inheritance.
- 6) Student mark list using multilevel inheritance.
- 7) Volume using Method overloading.
- 8) Method overriding.
- 9) Multiply two matrices.
- 10) Sort the Strings in an alphabetical order.
- 11) String buffer.
- 12) Employee salary using an Interface.
- 13) Arithmetic operation using Package.
- 14) Multithreading.
- 15) Exception Handling
- 16) Draw the Face using an Applet.
- 17) Using control statements in an Applet.



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

Programme	: B.Sc.(Computer Science)	Part III	: Allied
Semester	: III	Hours per week	: 04
Sub. Code	:18UCSA31	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. Kanti Swarup, P.K. Gupta, Man Mohan, **Operations Research**, 17th Edition, Sultan Chand and Sons, 2014, New Delhi.

Unit I :	Book 1: Chapter 3 - Sections: 3.2, 3.4.
Unit II :	Book 1: Chapter 3 – Sections: 3.5, 3.6, 3.9.
Unit III :	Book 1: Chapter 4 – Section: 4.1
Unit IV :	Book 1: Chapter 5 – Sections: 5.1,5.2

Unit V : 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. Panneer Selvam. 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 COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme	:UG	Part IV	: Skill
Semester	: III	Hours per week	: 02
Sub Code	: 18UCSSP3	Credit	: 02

ANDROID APPLICATION DEVELOPMENT-LAB

Course Outcomes:

CO1: Develop a grasp of the Android OS architecture.

CO2: Understand different mobile application models/architectures and patterns.

CO3: Design and develop User Interfaces for the Android platform.

CO4: **Apply** 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 List View on App
11. Changing the font for Android Text views
12. Context menu for Android
13. Android App using Color Picker
14. Create simple app with database
15. Create AgeCalculator App



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

Programme	: UG	Part IV	: NME
Semester	: III	Hours per week	: 02
Sub Code	: 18UCSN31	Credit	: 02

WEB PROGRAMMING – LAB

Course Outcomes:

- CO1:** To make the students to understand the basics of web designing by using HTML tags.
CO2: Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
CO3: To make the students to design web pages using Forms and Frames.
CO4: To understand and practice embedded dynamic scripting on client side Internet Programming.

HTML

1. Creation of HTML Document using basic html tags.
2. Creation of formatting tags.
3. Creation of Webpage using text, color, background, font elements.
4. Creation of Webpage using table tags.
5. Creation of Webpage for image tags.
6. Creation of Webpage using HREF tags with the attributes alink, vlink.
7. Creation of Webpage showing Ordered and Unordered list for favorite hobbies.
8. Creation of Webpage ,when user clicks on the link it should go top and bottom of the page.
9. Creation of College application forms using forms.
10. Creation of Webpage for frame for your personal data.
11. Creation of image map.
12. Creation of Webpage for any online Registration form.

DHTML

13. Creation of Webpage using Inline style sheet in CSS.
14. Creation of Webpage using Internal style sheet in CSS.
15. Creation of Webpage using External Style sheet in CSS.

FOURTH SEMESTER



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

Programme	: UG	Part III	: Core
Semester	: IV	Hours per week	: 05
Sub Code	: 18UCSC41	Credit	: 04

PROGRAMMING IN PHP

Course Outcomes:

CO1: To understand the concepts and architecture of the World Wide Web.

CO2: To develop a dynamic web page by the use of Java script and DHTML.

CO3: To make the students to develop skills to create server-side scripts using PHP.

CO4: To develop hands on experience using open source technologies such as HTML, CSS, Java script, PHP & MYSQL

UNIT I

FUNDAMENTALS OF PHP: Introduction – My First PHP Program – Whitespace – Echo – Echo Quotes - Variables – Constants – Operators – Pre/Post – Increment & Pre/Post-Decrement.

UNIT II

LOOPS, STRINGS AND STATEMENTS : Loops-While Loop – For Loop – For Each Loop – Do While Loop – Strings – If and Switch Statement.

UNIT III

ARRAYS AND FUNCTIONS: Arrays: Creating an Array with Array identifier – Creating Array in Mix Environment – Counting Number of elements in Array – Calculating Array values – Checking Element Existence inside an array – Associative arrays. Functions: Returning Function – Function within a function – Passing argument by value – Passing argument by Reference – Returning values from function – Variable Functions.

UNIT IV

DATABASES: Introduction – Database Tables-Queries-PHP MySQL Connection to a database-Connecting to a MySQL Database-Closing a Connection. PHP MySQL Creating Database and Tables-Creating a Database-Creating a Table-MySQL Data Types-Primary Key and Auto Increment Fields-PHP MySQL Select-Display the result in an HTML Table-PHP MySQL The WHERE Clause-The WHERE clause- PHP MySQL ORDER BY keyword-The ORDER BY keyword-Sort Ascending or Descending-Order by Two Columns-PHP MySQL Update-Update data in a database-PHP MySQL Delete from –Delete data in a Database.

UNIT V

COOKIES, SESSIONS AND FORMS: Cookies – Sessions – Forms – Running the program.**MORE ON PHP:** Date and Time – Files – Reading a File – Appending in a File – Deleting a File -Include function – Require function – PHP Database ODBC.

Text Book:

Dinesh Maidasani, **PHP**, Firewall Media (An Imprint of Laxmi Publication Pvt Ltd.,) First Edition, 2007, reprint 2008, 2013, New Delhi.

Unit I	:	Chapters	- 1
Unit II	:	Chapters	- 2
Unit III	:	Chapters	- 3
Unit IV	:	Chapters	- 4
Unit V	:	Chapters	- 5,6

Reference Books:

1. Bayross (Ivan), **Web Enabled Commercial Application Development using HTML, Java script, DHTML and PHP with CDROM**, BPB Publication, Fourth Edition, 2010, New Delhi.
2. Guengerich (Steve), **PHP6 and MYSQL**, Willey India, Fourth Edition, 2014, New Delhi.
3. Murah.J and Harris.R, **PHP and MYSQL** ,Mike Murach& Associates ,Inc., 2010

Online references:

1. https://spoken-tutorial.org/tutorial-search/?search_foss=PHP+and+MySQL&search_language=English
2. <https://www.mooc-list.com/course/building-web-applications-php-coursera>



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DEPARTMENT OF COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme	: UG	Part III	: Core
Semester	: IV	Hours per week	: 05
Sub Code	: 18UCSCP4	Credit	: 04

PROGRAMMING IN PHP- LAB

Course Outcomes:

- CO1:** Helps the students to develop programming skills in Script.
- CO2:** Using PHP to manipulate files.
- CO3:** Using the PHP, MyAdmin utility to admin the MySQL database.
- CO4:** Gain confidence to create dynamic website on real world problems.

PHP

1. Declaration and accessing variables in PHP.
2. Decision making in PHP.
3. Control structure in PHP.
4. OTP generation in PHP
5. Price chart creation in PHP.
6. Types of arrays in PHP.
7. Forms in PHP.
8. Program to create a Simple Calculator.
9. Programs to create simple Login and Logout using sessions.
10. To send email in PHP.
11. Basic connection program in PHP / MySql.
12. Electricity bill preparation using PHP with MySql.
13. Employee pay slip preparation using PHP with MySql.
14. Student mark list preparation using PHP with MySql.
15. File upload in PHP with MySql.
16. Image Upload in PHP with MySql.
17. Combine Java script and PHP for client side validation.
18. Combine Java script and PHP for server side validation



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

Programme : UG	Part III	: Allied
Semester : IV	Hours per week	: 04
Sub. Code : 18UCSA41	Credit	: 04

NUMERICAL APTITUDE

Course Outcomes

CO1: To introduce basic concepts of Mathematics.

CO2: To develop the computational skills.

CO3: To improve required skills to face competitive examinations.

CO4: To create skills in solving real life word problems.

Unit I:

HCF and LCM of numbers - Simplification.

Unit II:

Average - Problems on ages.

Unit III:

Ratio and Proportion - Alligation or Mixture.

Unit IV:

Simple Interest - Calendar.

Unit V:

Permutations and Combinations – Pie charts.

Text Book:

1. Aggarwal. R.S., **Quantitative Aptitude**, 7th Fully Revised Edition, S.Chand & Company Limited, Reprint 2008, New Delhi.

Unit I – Chapter 2 (All solved problems and first 10 Exercise problems)

Chapter 4 (All solved problems and first 10 Exercise problems)

Unit II – Chapter 6 (All solved problems and first 10 Exercise problems)

Chapter 8 (All solved problems and first 10 Exercise problems)

Unit III – Chapter 12 (All solved problems and first 10 Exercise problems)

Chapter 20 (All solved problems and first 10 Exercise problems)

Unit IV – Chapter 21 (All solved problems and first 10 Exercise problems)

Chapter 27 (All solved problems and first 10 Exercise problems)

Unit V – Chapter 30 (All solved problems and first 10 Exercise problems)

Chapter 38 (All problems including Exercise)

Reference Books:

1. AbhigitGuha, **Quantitative Aptitude**, 4th Edition, Tata McGraw Hill Publication, 2011, New Delhi.
2. MohanRao.U, **Quantitative Aptitude**, Scitech Publications, Reprint 2013, Chennai.
3. Dipak Kumar Yugnirmal, **Quantitative Aptitude**, Unicorn books Pvt Ltd., 2016, New Delhi.



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

Programme	: UG	Part IV	: Skill
Semester	: IV	Hours per week	: 02
Sub Code	: 18UCSSP4	Credit	: 02

WEB DESIGNING- LAB

Course Outcomes:

CO1: Helps the students to develop programming skills in HTML, DHTML.

CO2: Students gain the skills and project-based experience needed for entry into web design and development careers.

CO3: Review the current topics in Web & Internet technologies.

CO4: To analyze the web page and identify its elements and attributes.

HTML

1. Creation of HTML Document using basic tags.
2. Creation of Character Entities.
3. Creation of Webpage using text, color, background, font elements.
4. Creation of Webpage in HTML to show Block level elements and text level elements.
5. Creation of Bookshop inventory using Ordered and Unordered list.
6. Creation of Exam result webpage using Table tags and their attributes.
7. Creation of India map using image map and hyperlinks.
8. Creation of Bio-data using forms.
9. Creation of Webpage for College details using frames.
10. Creation of online job application form using forms.

DHTML

11. Creation of Webpage using Inline style sheet in CSS.
12. Creation of Webpage using Internal style sheet in CSS.
13. Creation of Webpage using External Style sheet in CSS.



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

Programme	: UG	Part IV	: NME
Semester	: IV	Hours per week	: 02
Sub Code	: 18UCSN41	Credit	: 02

MULTIMEDIA-LAB

Course Outcomes:

- CO1:** Understand multimedia technology and tools.
- CO2:** Develop an application using action script language.
- CO3:** Develop effective web template using various website components.
- CO4:** Identify the basic components of multimedia skills.

Flash

1. Create an animation to represent the growing moon.
2. Create an animation to indicate a ball bouncing on steps.
3. Simulate movement of a cloud.
4. Simulate a ball hitting another ball.
5. Draw the fan blades and to give proper animation.
6. Display the background given (filename: tulip.jpg) through your name.
7. Create an animated cursor using `startdrag("ss", true); mouse.hide();`

Adobe Photoshop

8. Design a visiting card containing at least one graphic and text information.
9. Prepare a cover page for the book in your subject area. Plan your own design.
10. Extract the flower only from given photographic image and organize it on a background. Selecting your own background for organization.
11. Adjust the brightness and contrast of the picture so that it gives an elegant look.
12. Remove the arrows and text from the given photographic image.
13. Type a word and apply the effects shadow emboss.
14. Display the background given (filename: garden.jpg) through your name using mask.
15. Change Given CMYK image into Black & White.

FIFTH SEMESTER



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

Programme : B.Sc (CS)	Part III	:
Core		
Semester : V	Hours	: 06
Subject Code: 18UCSC51	Credits	: 05

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: Classify the routing protocols and analyze how to assign the IP addresses for the given network

CO5: Justify how digital signatures are used to provide authentication

UNIT I

Introduction: Data communications– Networks –Network Types– Standards and Administration -
Network Models: Protocol Layering–TCP/IP Protocol Suite– The OSI Model.

UNIT II

Transmission Media: Introduction-Guided media – Unguided media (Wireless)–**Other Wireless Networks:** Cellular Telephony – Satellite Networks.

UNIT III

Error Detection and Correction: Introduction – Block Coding – Linear Block Codes – Cyclic Codes – Checksum –**Data Link Control:** DLC services– Data-Link Layer Protocols– HDLC– Point –To-Point Protocol

UNIT IV

Network Layer: Network Layer Services-Packet Switching-IPV4 Addresses-Forwarding of IP packets-**Unicast Routing:** Introduction-Routing Algorithms-Unicast Routing Protocols-
Multicast Routing: Introduction-Multicasting Basics-Intradomain Multicast Protocols- Interdomain Multicast Protocols-IGMP

UNIT V

Cryptography and Network Security: Introduction– Confidentiality – Other Aspects of Security

Text Book:

1. Behrouz A.Forouzan, **Data Communications and Networking**, Tata McGraw Hill Education Private Limited, New Delhi, Fifth Edition, 2013.

Unit I : Chapter 1 – Section: 1.1, 1.2, 1.3, 1.5

Chapter 2 – Section: 2.1- 2.3

Unit II : Chapter 7 – Section : 7.1,7.2,7.3

Chapter 16 – Section: 16.2,16.3

Unit III : Chapter 10 – Section :10.1-10.5

Chapter 11 – Section :11.1-11.4

Unit IV : Chapter 19- Section: 18.1,18.2,18.4,18.5

Chapter 20- Section: 20.1-20.3

Chapter 21-Section: 21.1-21.5

Unit V : Chapter 31- Section: 31.1-31.3

Reference Books:

1. Andrew S.Tanenbaum, **Computer Network**, Prentice Hall of India, New Delhi, Fifth Edition, 2014.
2. Prakesh C.Gupta, **Data Communications & Computer Networks**, Prentice Hall of India, New Delhi, Third Edition, 2006.
3. William Stallings, **Data and Computer Communications**, Prentice Hall of India, New Delhi, Seventh Edition, 2004.

Web Resources:

1. <https://beginnersbook.com/2019/03/introduction-to-computer-network/>
2. <https://www.computernetworkingnotes.com/networking-tutorials/>
3. <https://www.tutorialride.com/computer-network/computer-network-tutorial.htm>



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Programme	: B.Sc (CS)	Part III	:
Core			
Semester	: V	Hours	: 06
Subject Code	: 18UCSC52	Credits	: 05

RELATIONAL DATABASE MANAGEMENT SYSTEM

COURSE OUTCOMES

On successful completion of the course, the learners should 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

1. Dr.P.S.Deshpande , SQL & PL/SQL for Oracle 11g Black Book TM, 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: A developer's Guide, Apress

Web Resources:

1. <https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm>
2. <https://www.webopedia.com/TERM/R/RDBMS.html>
3. <https://www.webucator.com/tutorial/learn-sql/relational-database-basics.cfm>



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DEPARTMENT OF COMPUTER SCIENCE
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Programme : B.Sc (CS)
Semester : V
Sub code : 18UCSCP5

Part III : Core
Hours : 06
Credits : 04

RELATIONAL DATABASE MANAGEMENT LAB

Course Outcomes:

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

- CO1:** Write the basic database language commands to create simple database.
- CO2:** Apply PL/SQL for processing database.
- CO3:** Analyze the database using queries to retrieve records.
- CO4:** Evaluate the importance of queries and procedures to create real world applications.
- CO5:** Develop solutions using database concepts for real time requirements.

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



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

Programme : B.Sc (CS)
Semester : V
Subject Code : 18UCSE51

Part III : Core Elective -I
Hours : 05
Credits : 04

OPERATING SYSTEM

Course Outcomes

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

- CO1:** Define Operating System, its components and Goals, basic concepts, structure and functions of operating systems
- CO2:** Explain the mutual exclusion primitives, semaphores and concurrent programming.
- CO3:** Implement processor scheduling, deadlock prevention and avoidance for a given scenario.
- CO4:** Compare contiguous vs noncontiguous memory allocation and fixed and variable partition multiprogramming
- CO5:** Analyze the necessity of Disk Scheduling and various file systems.

UNIT I

Introduction To Operating System: Introduction, Operating System Components And Goals, Operating System Architecture. Process Concepts: Introduction, Process States, PROCESS MANAGEMENT, INTERRUPTS, INTERPROCESS COMMUNICATION

UNIT II

Asynchronous Concurrent Execution: Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software Solutions To The Mutual Exclusion Problem, Hardware Solution To The Mutual Exclusion Problem, Semaphores. Concurrent Programming: Introduction, Monitors.

UNIT III

Deadlock And Indefinite Postponement: Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource Concepts, Four Necessary Conditions For Deadlock, Deadlock Solution, Deadlock Prevention, Deadlock Avoidance With Dijkstra's Banker's Algorithm, Deadlock Detection, Deadlock Recovery. Processor Scheduling: Introduction, Scheduling Levels, Preemptive Vs Non-Preemptive Scheduling Priorities, Scheduling Objective, Scheduling Criteria, Scheduling Algorithm

UNIT IV

Real Memory Organization And Management: Introduction, Memory Organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous vs Non Contiguous Memory Allocation, Fixed Partition Multiprogramming, Variable Partition Multiprogramming Virtual Memory Management : Introduction, Page Replacement, Page Replacement Strategies , Page Font Frequency, Page Size

UNIT V

Disk Performance Optimization: Introduction, Why Disk Scheduling Necessary, Disk Scheduling Strategies, Rotational Optimization File and Database System: Introduction, Data Hierarchy, File System, File Organization, File Allocation, Free Space Management, File Access Control

Text book:

1. Operating Systems by H.M.Deitel, P.J.Deitel, D.R.Choffnes- Pearson education Third Edition-2008

UNIT I	Chapter 1: 1.1, 1.2, 1.12, 1.13, Chapter-3: 3.1, 3.2, 3.3, 3.4, 3.5
UNIT II	Chapter 5: 5.1, 5.2, 5.3, 5.4(up to 5.42), 5.5, 5.6 Chapter -6: 6.1, 6.2
Unit-III	Chapter 7: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10 Chapter 8: 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7
Unit-IV	Chapter 9: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.8, 9.9 Chapter 11: 11.1, 11.5, 11.6, 11.8, 11.9, 11.10
Unit-V	Chapter 12: 12.1, 12.4, 12.5, 12.6 Chapter 13: 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8,

Reference Books

1. A. Tanenbaum, 'Modern Operating Systems', Prentice Hall India, 2003.
2. An Introduction to Operating Systems Concepts and Practice by Pramod Chandra P.Bhatt, PHI 2nd Edition, 2008.
3. Silberschatz A, Galvin P.B., Gange G, Operating System Concepts, John Wiley & Sons, INC, New Delhi, Sixth Edition, 2002.
4. Milan Milenkovic, Operating System Concepts and Design, Tata McGraw Hill, New Delhi, Third Edition, 1997.
5. M.J. Bach, 'Design of Unix Operating system', PrenticeHall, 1986. Computer Engineering IIT Roorkee A joint venture by IISc and IITs, funded by MHR

Web Resources:

1. <https://codescracker.com/operating-system/>
2. <http://yumpu-download.tiny-tools.com/pages.php?id=27375301>
3. <https://www.cl.cam.ac.uk/teaching/1011/OpSystems/os1a-slides.pdf>



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
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Class : B.Sc (CS)
Semester : V
Subject Code : 18UCSE52

Part III : Elective
Hours : 05
Credits : 04

DATA MINING

Course Outcomes:

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

CO1: Know the data mining principles, techniques and discover the knowledge imbibed in the

high dimensional system.

CO2: Study algorithms for finding the hidden interesting patterns in data in real life.

CO3: Expose the students to the concepts of Data warehousing Architecture, implementation and analyze the various models.

CO4: Prepare evaluation criteria for classification methods and clustering

CO5: Study the overview of Web mining, Text mining and Big Data Mining Tools and develop application tools

UNIT I

Data Mining – why Data Mining Now – The data Mining Process – Data Mining Applications – Data Mining Techniques – Some Data Mining Case Studies – The Future of Data Mining – Guidelines for Successful Data Mining – Data Mining Software.

UNIT II

Introduction – Basics – The Task and Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm – Direct Hashing and Pruning DHP-Mining Frequent Patterns without Candidate Generation – Performance Evaluation of Algorithms – Software for Association Rule Mining.

UNIT III

Introduction – Decision Tree – Building a decision Tree- The Tree Induction Algorithm – Decision Tree Rules – Decision tree summary –Other Evaluation Criteria for classification methods – Classification Software- Cluster Analysis – Desires Features of cluster analysis – Types of data- computing distance- Types of Cluster analysis methods – Partitional Methods – Hierarchical Methods –cluster Analysis Software.

UNIT IV

Introduction – Web Mining- Web Technology and characteristics – Locality and Hierarchy in the web – Web content Mining – Web Usage Mining – Web Structure Mining – Web Mining Software.

UNIT V

Dataware houses-Dataware house design-data warehouse metadata-OLAP- Characteristics of OLAP systems-Multidimensional view and Datacube - Datacube implementations-Datacube operations

Text book:

1. Introduction to Data Mining with Case studies, G.K. Gupta, PHI Third Edition, 2006

UNIT I	:	Chapters - 1.1 to 1.9.
UNIT II	:	Chapters - 2.1 to 2.11
UNIT III	:	Chapters -3.1 to 3.3, 3.7, 3.8, 3.12, 3.13, 4.1 to 4.7, 4.11
UNIT IV	:	Chapters –5.1 to 5.7
UNIT V	:	Chapters -7.4, 7.5, 7.7, 8.2, 8.3, 8.5, 8.6, 8.7

Reference Books

1. Data Mining Concepts & Technologies, Jiawei Han, Michelinekamber, Morgan Kaufmann, Second Edition, 2005.
2. Data Mining, Vikram Pudi,P.Radha Krishna, Oxford University Press, First Edition, 2009.
3. Data Warehousing – Reema Thareja Oxford University Press – 2009.
4. Insight into Data Mining Theory and Practice – K.p. Soman, Shyam Diwakar, V.Ajay, Prentice Hall of India – 2008

Web Resources:

1. https://www.exinfm.com/pdf/files/intro_dm.pdf
2. <https://maths-people.anu.edu.au/~steve/pdcn.pdf>
3. <https://www.guru99.com/data-mining-tutorial.html>



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

Programme : B.Sc (CS)
Semester : V
Sub Code : 18UCSE53

Part III : Elective
Hours : 05
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 – Compilers.

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.Dhamdhare, **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.

Web Resources:

1. http://www.darshan.ac.in/Upload/DIET/Documents/CE/Darshan%20-%20Sem5%20-%202150708%20-%20SP_25112015_054658AM.pdf
2. <http://ecomputernotes.com/fundamental/disk-operating-system/system-software>
3. https://www.technicalsymposium.com/SYSTEM_SOFTWARE_FULL_NOTES.html



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

Programme :B.Sc(CS)	Part III : Elective
Semester : V	Hours : 05
Subject code : 18UCSE54	Credits : 04

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

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

CO1: Understand the concept of Symmetric key and Asymmetric key cryptography

CO2: Apply the symmetric-key ciphers and asymmetric key ciphers to encrypt data

CO3: Analyze the different crypto systems in asymmetric key cryptography for data authentications

CO4: Evaluate the various digital signature schemes to check the user authentication

CO5: Compose secure data exchange between sender and receiver by using message integrity and message authentication

UNIT I

Introduction: Security Goals – Cryptographic Attacks – Services and Mechanism – Techniques

Traditional symmetric-key ciphers: Introduction – Substitution Ciphers – Transposition Ciphers – Stream and Block Ciphers

UNIT II

Introduction to Modern Symmetric-key Ciphers: Modern Block Ciphers – Modern Stream Ciphers. **Data Encryption Standard (DES):** Introduction – DES Structure – DES Analysis – Security of DES – Multiple DES-Conventional Encryption Algorithms – Examples of Block Ciphers Influenced by DES

UNIT III

Advanced Encryption Standard (AES): Introduction – Transformations – Key Expansion – The AES Ciphers – Examples – Analysis of AES. **Asymmetric-key Cryptography:** Introduction – RSA Cryptosystem – Rabin cryptosystem – Elgamal Cryptosystem – Elliptic Curve Cryptosystems

UNIT IV

Message Integrity and Message Authentication: Message Integrity – Random Oracle Model – Message Authentication. **Digital Signature:** Comparison – Process – Services – Attacks and Digital Signature – Digital Signature Schemes – Variations and Applications.

UNIT V

Key Management: Symmetric-key Distribution – Kerberos – Symmetric-key Agreement – Public-key Distribution –Hijacking. **System Security:** Description of the System- Users, Trust and Trusted Systems – Buffer overflow and Malicious Software – Malicious Programs

– Worms – Viruses – Intrusion Detection Systems(IDS) – Firewalls: Definitions, Construction and Working Principles.

Text book:

1. Behrouz A.Forouzan, Debdeep Mukhopadhyay, ”**Cryptography and Network Security**”, 2nd Edition, TataMcgraw Hill Education Pvt Ltd, New Delhi, 2013.

Unit – I	:	Chapter 1, 3
Unit – II	:	Chapter 5, 6
Unit – III	:	Chapter 7, 10
Unit – IV	:	Chapter 11, 13
Unit – V	:	Chapter 15, 19

Reference Books:

1. Atul Kahate, “**Cryptography and Network Security**” Third Edition, Mcgraw Hill Education (India) Pvt.Ltd, NewDelhi,2011.
2. S.Bose, P.Vijayakumar “**Cryptography and Network Security**”, Pearson Edition, Chennai,2017

Web Resources:

1. <https://nptel.ac.in/courses/106105031/>
2. http://www.cse.iitm.ac.in/~chester/courses/16e_cns/slides/01_Introduction.pdf
3. http://www.cse.iitm.ac.in/~chester/courses/16e_cns/slides/01_Introduction.pdf



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

Programme : B.Sc (CS)
Semester : V
Subject Code : 18UCSE55

Part III : Elective
Hours : 05
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 and design AI machine and enveloping applications for real world problems.

UNIT I

AI: The Problem- Assumptions- AI technique- Level of the model- Criteria for success- Problems: Problem Spaces and Search- Production Systems- Problem Characteristics- Reduction 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 Issue: Representation and Mappings – Approaches, issue in Knowledge representation- Frame problem. Using Predicate Logic :Representation of simple facts in logic-Instance and ISA relationships- Computable function 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 Non Monotonic Reasoning – Logic for Non Monotonic 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.

Web Resources:

1. www.techopedia.com/definition/190/artificial-intelligence-ai.
2. <https://hackr.io/tutorials/learn-artificial-intelligence-ai>
3. www.edx.org/learn/artificial-intelligence



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

Programme : B.Sc (CS)
Semester : V
Subject Code: 18UCSE56

Part III : Elective
Hours : 05
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- 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- SmartLighting- 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 & 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 Madiseti, **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

References:

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”, 1st Edition, A Press Publications, 2013.

Web Resources:

1. <https://www.edureka.co/blog/iot-tutorial/>
2. <https://www.gangboard.com/blog/iot-tutorial/>
3. https://www.cs.ucy.ac.cy/courses/EPL422/slides19/Topic10b-IoT_intro.pdf



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

Programme : B.Sc (CS)
Semester : V
Subject Code: 18UCSSP5

Part IV: Skill
Hours : 02
Credits : 02

LINUX LAB

Course Outcomes:

On successful completion of this Lab the student will be able to

CO1: Know the student setup users and groups, Configure user defaults, logins and user profiles.

CO2: Effectively use the UNIX/Linux system to accomplish typical personal, office, technical, and software development tasks.

CO3: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.

1. Basic Commands in Linux.
2. Number Checking in Linux
3. Multiplication Table in Linux.
4. Roman Letter Conversion in Linux.
5. Checking File or Directory in Linux.
6. File Operations in Linux.
Create, Copy, Delete, Rename
7. Directory Operations in Linux
Create, Remove, Toggle
8. Directory Operations in Linux
Copy, Move
9. Listing the files regarding their names in Linux.
10. Changing the access rights in Linux.
11. Counting number of users currently logged in Linux.
12. List of files having full access rights in Linux.
13. Counting number of lines, words and characters in a file in Linux
14. Fibonacci series in shell scripting.
15. Odd or even in shell scripting

SIXTH SEMESTER



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

Class : B.Sc (CS)
Semester : VI
Sub Code : 18UCSC61

Paper III : Core
Hours : 06
Credits : 05

C# AND.NET PROGRAMMING

COURSE OUTCOMES

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

CO1 Represent the insights of the Internet programming

CO2 Demonstrate design and implement complete application over the web

CO3 ConnectMS.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 and Branching-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.
- 2.

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.

Web Resources:

<https://www.guru99.com › net-framework>
<https://docs.microsoft.com › en-us › dotnet>
<https://www.c-sharpcorner.com>



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

Class	: BSc (CS)	Paper III	: Core
Semester	: VI	Hours	: 06
Subject Cod	: 18UCSCP6	Credits	: 04

C# AND.NET PROGRAMMING LAB

Course Outcomes:

On successful completion of the course, the learners should 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 print number pattern
2. C# program for pascal triangle
3. C# program for boxing and unboxing.
4. C# program for Structures and Enumerations
5. C# program for properties.
6. C# program for classes and objects.
7. C# program for inheritance.
8. C# program for the different parameter passing methods.
9. C# program for delegate.
10. C# program for the preparation of menu card.
11. C# program to implement the various user interface.
12. C# program for base class constructor.
13. C# program for operator overloading.
14. C# program for window application.
15. C# program for method overloading and overriding.
16. C# program for user and pre-defined exception.



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DEPARTMENT OF COMPUTER SCIENCE
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Class	: B.Sc. CS	Part III	: Core
Semester	: VI	Hours	: 06
Subject Code	: 18UCSPR1	Credits	: 04

PROJECT AND VIVA – VOCE

Course Outcomes

- CO1** The Project Lab is one that involves practical work for understanding and solving problems in the field of computing.
- CO2** Students will select individually Commercial or Technical Project based on Application 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	}	40
Submission		

External

Project Report	}	60
Viva Voce		

Total	- 100
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DEPARTMENT OF COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme : B.Sc (CS)
Semester : VI
Subject Code : 18UCSE61

Part III : Elective
Hours : 05
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:** 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>



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DEPARTMENT OF COMPUTER SCIENCE
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Programme : B.Sc(CS)	Part III	: Elective
Semester : VI	Hours	: 05
Subject code: 18UCSE62	Credits	: 04

SOFTWARE PROJECT MANAGEMENT

COURSE OUTCOMES:

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

- CO1:** Define the methods used to evaluate and select projects for investment of funds.
- CO2:** Elaborate knowledge on the principles and techniques of software project management.
- CO3:** Prepare organization behavior and general management techniques used for project.
- CO4:** Organize test case design and types of testing.
- CO5:** Evaluate the levels of testing.

UNIT I

Software Projects And Project Models: Introduction: Software projects Vs Other types of projects – SPM Activities – Plans, methods, Methodologies – Categorizing software projects - Stepwise project planning - Project evaluation: Technical assessment – Cost-benefit analysis – Cost-benefit evaluation techniques – Risk evaluation – Selection of an appropriate project approach: Choice of process models .

UNIT II

Software Project Handling : Software Effort Estimation: The basis for software estimating - Effort estimation techniques Activity planning: Sequencing and Scheduling activities – Network planning models –Precedence networks – Activity on arrow networks - Critical path - Resource Allocation: Resource requirements – Scheduling - Cost schedules - Monitoring and Control: Visualizing progress - Cost monitoring – Earned value analysis - Prioritizing monitoring – change control. Software Quality - SQA plan, Techniques, Conventions and Metrics.

UNIT III

Testing Fundamentals : Introduction to Testing as an Engineering activity: Testing as a Process- TMM – Testing fundamentals: Basic Definitions, Software Testing Principles, The Tester’s Role – Defects, Hypotheses and Tests: Origins of Defects, Defect Classes, The Defect Repository and Test Design, Defect Examples.

UNIT IV

Testing Approaches : Test case design (Black box): Test Case Design Strategies, Random Testing, Equivalence Class Partitioning, Boundary Value Analysis - Test case design (White box): Test Adequacy Criteria, Coverage and Control Flow Graphs, Covering Code Logic, Paths: Evaluating Test Adequacy Criteria.

UNIT V

Testing Methods : Levels of Testing: Unit, Integration Test, System Test, Regression, Alpha, Beta and Acceptance test - Test goals, policies, plans and documentation - Test Planning – Testing Tools: Overview of Software testing tools – Case study using an Open source Testing tool .

Text book:

1. Bob Hughes and Mike Cotterell, Software Project Management, 5th edition, McGraw-Hill Higher Education, 2009.

UNIT I	CHAPTER 1, 2	1.1-1.24,2.1-2.40
UNIT II	CHAPTER 3, 4	3.1-3.13, 4.1-4.2
UNIT III	CHAPTER 5	5.1-5.33
UNIT IV	CHAPTER 9	9.1-9.49
UNIT V	CHAPTER 11	11.1-11.81

References

1. Ilene Burnstein, “Practical Software Testing”, Springer International Edition, Seventh Indian, Reprint 2010.
2. RenuRajani and Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, New Delhi, 2005.
3. Paul C. Jorgensen “Software Testing, A Craftsman’s Approach”, 2nd Edition, 2007, CRC Press.

Web Resources:

1. <https://www.wrike.com> › project-management-guide
2. <https://www.mavenlink.com> › resources › what-is-project-management-sof...
3. <https://www.javatpoint.com> › software-project-management



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

Programme : B.Sc(CS)
Semester : VI
SubjectCode :18UCSE63

Part III: Elective
Hours :05
Credits :04

MOBILE COMPUTING

Course Outcomes:

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

CO1: Describe the Architecture, Application and Services of Mobile Computing.

CO2: Build an Application Based on the User Requirements.

CO3: Select Appropriate Framework for Developing Applications based on the Problem Requirements.

CO4: Explains the importance of Emerging Technologies, GPRS, CDMA and 3G, Security Issues.

CO5: Design and Develop Mobile Applications for Societal and Environmental IT Problems.

UNIT I

Introduction: Mobility of Bits & Bytes– Wireless – The Beginning–Mobile Computing– DialogueControl–Networks–MiddlewareandGateways–ApplicationandServices– Developing mobile computing applications–Security in mobile computing.Mobile computing architecture: Internet–The ubiquitous network–Architecture for mobile computing–Three-tier architecture–Design considerations for mobile computing–Mobile computing through internet.

UNIT II

Mobilecomputingthroughtelephony: Evolution of Telephony– Multipleaccessprocedures–Satellitecommunicationsystems–Mobile computing through telephone–developing an IVR application–Voice XML–TAPI– Computer supported telecommunication Applications,**EmergingTechnologies:**Introduction–Bluetooth–RFID– Wireless broadband-MobileIP–IPV6–Javacard.

UnitIII

Global System for mobile communications(GSM):GSM Communications–GSM Architecture–GSM Entities–Call routing in GSM–PLMN interfaces–GSM addresses & identifiers–Network Aspectsin GSM–MobilityManagement–GSMfrequency allocation– Personalcommunication sservice–Authentication &security.

General Packet Radio Service(GPRS):Introduction–GPRS & Packet data network– Network architecture–Network operations–DataServices in GPRS –Applications for GPRS – Limitations of GPRS–Billing & Charging in GPRS–EDGE.

UNIT IV

Wireless Application Protocol(WAP): Introduction –WAP–MMS–GPRS– Applications.**CDMAand3G:**Spread SpectrumTechnology–IS-95–CDMA versus GSM– WirelessData–Third generation networks-Applications on 3G.

UNIT V

Wireless LAN:Advantages–IEEE 802.11standards–Wireless LAN Architecture– Mobility in wireless LAN–Deploying WLAN–Mobile Adhoc networks and Sensor networks–Wireless LAN.Security–Wireless access in Vehicular environment-Wireless local loop–Hiper LAN–WIFI versus 3G.**Security Issues in mobile computing:**Information Security–Security techniques and algorithms–Security Protocols–Public key infrastructure– Trust–Security models–Security Frameworks fo rmobile environment.

Text book:

1. Asokek Talukder, HasanAhmed, RoopaRYavagal, **Mobile Computing Technology, Applications and Service Creation**, Second Edition, Tata Mc Graw Hill, New Delhi, 2012.

UNIT I – Chapters1.1to1.9,2.3,2.4,2.5,2.6,2.7
UNIT II– Chapters3,4
UNIT III – Chapters5,7
UNIT IV – Chapters8,9
UNIT V – Chapters10,20

ReferenceBooks:

1. Jochen Schiller, **Mobile Communications**, 2nd Edition, Pearson Education, Delhi, 2003.
2. William Stallings,**Wireless Communications and Networks**, 2nd Edition, Pearson Education, Delhi, 2004.

Web Resources:

1. <https://www.minigranth.com> › mobile-computing
2. <https://www.simplilearn.com> › mobile-technology-platforms-applications-t...
3. kosmi.snubi.org › APAMI › resource › Tutorials › T2-Leong



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(For those who joined in 2018-2019 and after)

Class	:B.Sc(CS)	Part III	: Elective
Semester	: VI	Hours	: 05
Sub code	: 18UCSE64	Credits	: 04

CLOUD COMPUTING

Course Outcomes

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

- CO1:** Define Cloud Computing and its types
- CO2:** Explain the architecture of cloud computing
- CO3:** Make use of Virtualization Techniques
- CO4:** Analyze the different Google applications
- CO5:** Propose the various applications in the Cloud

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: compos ability – Infrastructure – platforms - Virtual appliances - Communication protocols – Applications.

Understanding Services and Applications by Type: Defining IaaS(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.

Web Resources:

1. <https://www.citrix.com › en-in › glossary › what-is-cloud-computing>
2. <https://data-flair.training › Blog Home › Cloud Computing Tutorials>
3. https://www.tutorialspoint.com › cloud_computing



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

Class : B.Sc (CS)
Semester : VI
Subject Code : 18UCSE65

Part III : Elective
Hours : 05
Credits : 04

BIOMETRICS

Course Objective:

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

CO1: Relate the security infrastructure in the industry and generally in information sensitive environments.

CO2: Show the brief functioning of biometric system.

CO3: Describe the different types of biometric and their accuracy.

CO4: Analyze the awareness of privacy issues for end users and for students.

CO5: Develop the likelihood that biometric technologies, when deployed, will be as protective of personal and informational privacy as possible.

UNIT I:

Working of Authentication Technologies – working principles of Biometrics .

UNIT II:

Fingerprint and Hand Geometry – Facial and Voice Recognition

UNIT III:

Eye Biometrics: Iris and Retina Scanning – Signature Recognition and Keystroke Dynamics.

UNIT IV:

Esoteric Biometrics-Biometric liveness Testing.

UNIT V:

Biometrics in Large Scale Systems – Biometric Testing and Evaluation.

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



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF COMPUTER SCIENCE
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Programme : B.Sc (CS)
Semester : VI
Subject Code : 18UCSE66

Part III : Elective
Hours : 05
Credits : 04

NEURAL NETWORKS

Course Outcomes:

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

CO1: Know the basics of biological Neural Network and its types.

CO2: Attain the capability to apply the algorithms and techniques of neural network in real life problem domains

CO3: Categorize the different types of neural networks and its architecture.

CO4: Predict human behavior in social web and related communities.

CO5: Construct solution for fuzzy network and Patterns Recognition Applications

UNIT I

Introduction: Brain as a Neural Network – Basic Properties of Neurons- Artificial Neural networks- **Learning:** Learning and Training-Learning Rules-Stability and Plasticity.

UNIT II

Hopfield, Perceptron and related models: Hopfield Model-Basic Models of Hopfield Network-Cellular Neural Networks- Perceptron -Other Associative Models. **Adaptive Resonance Theory:** Network for ART-1-ART-2 Network.

UNIT III

Self-Organization Maps: Kohonen Map-Adaptive of Learning Vector Quantization- Multilayer self – organizing feature map. **Feed-Forward Back Propagation networks-** Training of Multilayer Feed-Forward Networks by back propagation-Training Aspects and Variations of Back propagation Method- Back propagation as stochastic approximation.

UNIT IV

Hybrid Learning Neural Networks-Counter Propagation Network-Radial Basis Function Networks-**Probabilistic Models, Fuzzy ARTMAP and Recurrent Networks:** Probabilistic Neural Networks-General Regression Neural Networks –Fuzzy ARTMAP-Recurrent back propagation neural networks.

UNIT V

Application of Neural Networks: Design and Optimization of Systems-System Identification and Monitoring- Patterns Recognition Applications-Motion and Vibration Control Applications.

Text book:

1. M.Ananda Rao, J.Srinivas “Neural Networks Algorithms and Applications”, Narosa

Publishing House, Fifth Reprint 2010.

UNIT I : Chapters: 1, 2

UNIT II : Chapters: 3, 4

UNIT III : Chapters: 5, 6

UNIT IV : Chapters: 7, 8

UNIT V : Chapters: 9

Reference Book:

1. Laurene Fausett, "Fundamentals of Neural Networks" , Pearson Education,2004..
2. Simon Haykin, "Neural Networks- A comprehensive foundation", Pearson Education, 2003.
3. S.N.Sivanandam, S.Sumathi,S. N. Deepa "Introduction to Neural Networks using MATLAB 6.0", TATA Mc Graw Hill, 2006.



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DEPARTMENT OF COMPUTER SCIENCE
(For those who joined in 2018-2019 and after)

Programme	: B.Sc (CS)	Part IV	: Skill
Semester	: VI	Hours	: 02
Sub Code	: 18UCSSP6	Credits	: 02

PYTHON PROGRAMMING LAB

COURSE OUTCOMES:

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

- CO1** Recall the basics of declaration of variables, statements and expressions
- CO2** Develop the program using branching and looping statements
- CO3** Interpret the logic into code using Recursion, Function and Module
- CO4** Examine the logical skill of python program using exception
- CO5** Create a new modules and interfaces implementing the concept

LIST OF EXPERIMENTS

1. Find the Square root
2. Calculate the Area of a triangle
3. Quadratic Equation
4. Swap two variables
5. Generate a Random number
6. Convert Kilometers to Miles
7. Convert Celsius to Fahrenheit
8. Largest among three numbers
9. Prime numbers in interval
10. Factorial of a number
11. Fibonacci sequence
12. Armstrong number in an interval
13. Find factors of number
14. Make a simple calculator
15. Fibonacci sequence using recursion
16. Sum of Natural numbers using recursion
17. Add two matrices
18. Multiply two matrices
19. Check whether a string is Palindrome or Not
20. Count the number of each vowel