# MANNAR THIRUMALAI NAICKER COLLEGE

# PASUMALAI, MADURAI– 625 004

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

(Re-accredited with 'A' Grade by NAAC)

## B.Sc., Computer Science

## SYLLABUS AND REGULATIONS

UNDER
CHOICE BASED CREDIT SYSTEM (CBCS)
**(For those who joined during 2018-2019 and after)**

**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 x01= 06 Marks

**Part –B**

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

**Part –C**

One question out of two 1 x 10 =10 Marks

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Total 30 Marks

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Pattern of the question paper for the Summative Examinations:

**Note: Duration- 3 hours**

**Part –A**

Ten multiple choice questions 10 x01 = 10 Marks

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

**Part –B**

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

(One question from each Unit)

**Part –C**

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

(One question from each Unit)

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Total 75 Marks

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**The Scheme of Examination (Environmental Studies and Value Education)**

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

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

**Question Paper Pattern**

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

**Part –A**

(Answer is not less than 150 words)

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

**Part –B**

(Answer is not less than 400 words)

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

Total 30 Marks

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

**Part –A**

(Answer is not less than 150 words)

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

(One question from each Unit)

**Part –B**

(Answer is not less than 400 words)

Three questions out of Five 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 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.

**MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)**
**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)<br>5(4) | 5(5)<br>5(5) | 5(5)<br>5(5) | 5(4)<br>5(4) | 6(5)<br>6(5)<br>6(4) | 6(5)<br>6(4)<br>6(4) | 76 | 63 | 14 | 1400 |
| **Elective** | | | | | 5(4)<br>5(4) | 5(4)<br>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**<br>**தற்கால கவிதையும் உரைநடையும்** | 1 | 6 | 3 | 25 | 75 | 100 |
| 18UENG11 | English-I:<br>Exploring Language ThroughLiterature-I | 1 | 6 | 3 | 25 | 75 | 100 |
| | **Part III: Core Subject** | | | | | | |
| 18UCSC11 | Programming in C | 1 | 5 | 4 | 25 | 75 | 100 |
| 18UCSCP1 | Programming in C - Lab | 1 | 5 | 4 | 40 | 60 | 100 |
| | **Part III: Allied Subject** | | | | | | |
| **18UCSA11** | Discrete Mathematics | 1 | 4 | 4 | 25 | 75 | 100 |
| 18UCSSP1 | **Part IV : Skill Subject**<br>PC Software - Lab | 1 | 2 | 2 | 40 | 60 | 100 |
| 18UEVG11 | **Part IV: Mandatory Subject**<br>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<br>பக்தி இலக்கியமும் நாடகமும் | 1 | 6 | 3 | 25 | 75 | 100 |
| 18UENG21 | English-II: Exploring Language Through Literature-II | 1 | 6 | 3 | 25 | 75 | 100 |
| | **Part III: Core Subject** | | | | | | |
| 18UCSC21 | Data Structuresand C++ Programming | 1 | 5 | 5 | 25 | 75 | 100 |
| 18UCSCP2 | Data Structuresand C++ Programming - Lab | 1 | 5 | 5 | 40 | 60 | 100 |
| 18UCSA21 | **Part III: Allied Subject**<br>Statistical and Numerical Methods | 1 | 4 | 4 | 25 | 75 | 100 |
| | **Part IV : Skill Subject** | | | | | | |
| 18UCSSP2 | Photoshop- Lab | 1 | 2 | 2 | 40 | 60 | 100 |
| | **Part IV: Mandatory Subject** | | | | | | |
| 18UVLG21 | 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**<br>காப்பிய இலக்கியமும் சிறுகதையும் | 1 | 6 | 3 | 25 | 75 | 100 |
| 18UENG31 | **Part II: English**<br>Exploring Language Through Literature-III | 1 | 6 | 3 | 25 | 75 | 100 |
| | **Part III: Core Subject** | | | | | | |
| 18UCSC31 | Programming in Java | 1 | 5 | 5 | 25 | 75 | 100 |
| 18UCSCP3 | Programming in Java – Lab | 1 | 5 | 5 | 40 | 60 | 100 |
| 18UCSA31 | **Part III: Allied Subject**<br>Operations Research | 1 | 4 | 4 | 25 | 75 | 100 |
| 18UCSSP3 | **Part IV: Skill Subject**<br>Android Application Development– Lab | 1 | 2 | 2 | 40 | 60 | 100 |
| 18UCSN31 | **Part IV: Non-Major Elective**<br>Web Programming- Lab | 1 | 2 | 2 | 40 | 60 | 100 |
| | **Total** | **7** | **30** | **24** | **220** | **480** | **700** |

**SEMESTER – IV**

| Subject Code | Subject | No.of Papers | Hours / 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<br>18UCSCP4 | **Part III: Core Subject** Programming in PHP<br>Programming in PHP – Lab | 1<br>1 | 5<br>5 | 4<br>4 | 25<br>40 | 75<br>60 | 100<br>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 |
| 18UCSC61 | **Part-III Core Subject** 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 |
| 18UCSSP6 | **Part IV : Skill Subject** Python Programming - Lab | 1 | 2 | 2 | 40 | 60 | 100 |
| | **Total** | **6** | **30** | **23** | **195** | **405** | **600** |

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

**Programme : B.Sc (CS)** | **Part III : Core**
**Semester : I** | **Hours : 05**
**Subject Code: 18UCSC11** | **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 – | Chapter11 – 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

**CourseOutcomes:**

**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)** **Part III : Allied**
**Semester : I** **Hours : 04**
**Subject Code : 18UCSA11** **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 toGraph Theory**, Scitech Publications India Pvt Ltd, Chennai, Reprint 2006.

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

**Reference Books**

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

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**Programme : B.Sc (CS)** | **Part IV : Skill**
**Semester : I** | **Hours : 02**
**Subject Code : 18UCSSP1** | **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)** **Part IV : Mandatory**
**Semester : I** **Hours : 02**
**Subject Code :18UEVG11** **Credits : 02**

## ENVIRONMENTAL STUDIES

| **COURSE OUTCOMES** | | |
|---|---|---|
| **CO1**:To gain knowledge on the importance of environmental education and ecosystem.<br>**CO2**:To acquire knowledge about environmental pollution- sources, effects and control measures of environmental pollution<br>**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<br>**CO4:** To make the student to understand the various pollution problems control mechanisms. | | |
| UNIT I | **:** | **Environment and Earth:** Environment – Meaning – Definition - Components of Environment – Types of Environment. Interference of man with the Environment. Need for Environmental Education. Earth – Formation and Evolution of Earth– Structure of Earth and its components – Atmosphere, Lithosphere, Hydrosphere and Biosphere.<br>**Natural Resources:** Renewable Resources and Non-Renewable Resources. Natural Resources and Associated Problems. Use and Exploitation of Forest, Water, Mineral, Food, Land and Energy Resources. |
| UNIT II | **:** | **Ecology and Ecosystems:** Ecology – Meaning - Definition – Scope – Objectives – Subdivisions of Ecology.<br>**Ecosystem**–Concept - Structure - Functions – Energy Flow – Food Chain and Food Web – Examples of Ecosystems (Forest, Grassland, Desert, Aquatic). |
| UNIT III | **:** | **Biodiversity:** Definition – Biodiversity at Global, National and Local Level. Values of Biodiversity – Threats to Biodiversity – Conservation of Biodiversity.<br>**Biodiversity of India:**Biogeographical Distribution – Hotspots of Indian Biodiversity – National Biodiversity Conservation Board and Its functions. Endangered and Endemic Species of India |
| UNIT IV | **:** | **Pollution Issues:** Definition – Causes – Effects and Control Measures of Air, Water, Soil, Marine, Noise, Thermal and Nuclear Pollutions.<br>**Global Issues:** Global Warming and Ozone Layer Depletion. Future plans of Global Environmental Protection Organisations. |
| UNIT V | **:** | **Sustainable Development:**Key aspects of Sustainable Development – Strategies for Sustainable Development - Agriculture – Organic farming – Irrigation – Water Harvesting – Water Recycling – Cyber Waste and Management.<br>**Disaster Management:**Meaning – Types of Disasters - Flood and Drought – Earth quake and Tsunami – Landslides and Avalanches – Cyclones and Hurricanes – Preventions and Consequences. Management of Disasters - |

**Text Book:**

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

**Reference Books:**

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

**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** | **: II** | **Hours** | **: 05** |
| **Subject Code** | **: 18UCSC21** | **Credits** | **: 05** |

## DATA STRUCTURES AND C++ PROGRAMMING

**CourseOutcomes:**

**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++ programm –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 Farell, **OOP Using C++**, Cengage Learning, 4$^{th}$Edition, 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**
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|---|---|---|---|
| **Programme** | **: B.Sc (CS)** | **Part III** | **: Core** |
| **Semester** | **: II** | **Hours** | **: 05** |
| **Subject Code: 18UCSCP2** | | **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.

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**DEPARTMENT OF COMPUTER SCIENCE**
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**Programme : B.Sc (CS)** | **Part III : Allied**
**Semester : II** | **Hours : 04**
**Subject Code : 18UCSA21** | **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 – Regulafalsi method – Newton Raphson method.

**Unit - V**

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

**Textbook:**

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

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

Unit I: Chapters 2, 3, 4

Unit II: Chapter 6

Unit III: Chapters 5 and 9

Unit IV: Chapter 3 – Section 3.1 – 3.5.

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

**Reference Books:**


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

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

**Programme : B.Sc (CS)** | **Part IV : Skill**
**Semester : II** | **Hours : 02**
**Subject Code : 18UCSSP2** | **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. Smoothening 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

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

**Programme : B.Sc (CS)** | **Part IV : Mandatory**
**Semester : II** | **Hours : 02**
**Subject Code : 18UVLG21** | **Credits : 02**

## VALUE EDUCATION

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

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

**Text Book:**

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

**Reference Books:**


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