

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc Software Engineering

(Choice Based Credit System)

(with effect from the academic year 2017-2018 onwards)

Sem	Part I/ II/ III/ IV/V	Subject No	Subject Status	Subject Title	Contact Hrs / week	L Hrs/ week	T Hrs/ week	P Hrs/ week	C Credits
I	I	1	Language	Tamil/Other Language	6	6	0	0	4
	II	2	Language	English	6	6	0	0	4
	III	3	Core	Programming in C	5	5	0	0	4
	III	4	Major Practical - I	Programming in C	4	0	0	4	2
	III	5	Allied -I	Discrete Mathematics	3	3	0	0	3
	III	6	Allied Practical - I	Computer Basics	4	0	0	4	2
	IV	7	Common	Environmental Studies	2	2	0	0	2
Subtotal					30	22	0	8	21
II	I	8	Language	Tamil/Other Language	6	6	0	0	4
	II	9	Language	English	6	6	0	0	4
	III	10	Core	Programming in C++	5	5	0	0	4
	III	11	Major Practical - II	Programming in C++	4	0	0	4	2
	III	12	Allied -II	Digital Design	3	3	0	0	3
	III	13	Allied Practical - II	Linux	4	0	0	4	2
	IV	14	Common	Value Based Education	2	2	0	0	2
Subtotal					30	22	0	8	21
III	III	15	Core	Java Programming	5	5	0	0	4
	III	16	Core	Data Structures	5	5	0	0	4
	III	17	Major Practical - III	Java Programming	6	0	0	6	3
	III	18	Allied -III	Scripting Languages	4	4	0	0	3
	III	19	Allied Practical - III	Scripting Languages	4	0	0	4	2
	III	20	Skill Based I Core	Computer Architecture	4	4	0	0	4
	IV	21	Non-Major Elective	1. Fundamentals of Internet 2. Basic Programming Design	2	2	0	0	2
Subtotal					30	20	0	10	22
IV	III	22	Core	Software Engineering	5	5	0	0	4
	III	23	Major Practical - IV	Data Structure	6	0	0	6	3
	III	24	Major Elective - I	1. Mobile Computing 2. Embedded System 3. Open Source	5	5	0	0	4

				Technologies					
	III	25	Allied -IV	E-Commerce	4	4	0	0	3
	III	26	Allied Practical - IV	PYTHON	4	0	0	4	2
	III	27	Skill Based II Common	Personality Development & Yoga	4	4	0	0	4
	IV	28	Non-Major Elective	1. HTML 2. Programming in C	2	2	0	0	2
	V		Extension Activity	NCC, NSS, YRC, YWF					1
				Subtotal	30	20	0	10	23
V	III	29	Core	Dot NET Technologies	5	5	0	0	4
	III	30	Core	Database Management System	5	5	0	0	4
	III	31	Core	Software Testing	5	5	0	0	4
	III	32	Major Practical - V	Dot NET	4	0	0	4	2
	III	33	Mini Project		4	0	0	4	4
	III	40	Major Elective - II	1. Data Mining 2. Cryptography 3. Cloud Computing	5	5	0	0	4
	III	41	Skill Based III Common	Computers for Digital Era	2	2	0	*	2
				Subtotal	30	22	0	8	24
VI	III	42	Core	Software Quality	4	4	0	0	4
	III	43	Core	Oracle	4	4	0	0	4
	III	44	Core	Operating Systems	4	4	0	0	4
	III	45	Core	Computer Networks and Communication	4	4	0	0	4
	III	46	Major Practical - VII	Oracle	4	0	0	4	2
	III	47	Major Project		6	0	0	6	7
	III	48	Major Elective - III	1. Network Security 2. Software Agents 3. Multimedia Technologies	4	4	0	0	4
				Subtotal	30	20	0	10	29
								Total	140* *

- * 10 hours of practical
- L-Lecture T-Tutorial P-Practicals

Programming in C

L T P C
3 1 0 4

Objective: To obtain knowledge about the structure of the programming language C and to develop the program writing and logical thinking skill.

Unit – I: INTRODUCTION

C Declarations:- Character Set – C tokens – Keywords and Identifiers – Identifiers – Constants – Variables – Data types – Declaration of Variables – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaring Variable as Constant. Operators and Expressions:- Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Expressions. Managing Input and Output Operations:- getchar() – putchar() – scanf() – printf(). (14L)

Unit – II: CONTROL STRUCTURES

Decision Making and Branching:- Decision Making with IF Statement – Simple IF statement – The IF...Else Statement – Nesting of IF...Else Statements – The ELSE IF ladder – The Switch Statement – The ?: Operator – The GOTO statement. Decision Making and Looping:- The WHILE Statement – The DO Statement – The FOR statement. (10L)

Unit – III: ARRAYS

One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays - Two-dimensional arrays – Initialization of Two-dimensional arrays – Multi-dimensional arrays. Character Arrays and Strings:- Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions. (10L)

Unit – IV: FUNCTIONS

User-Defined functions:- Need for User-defined functions – Definition of functions – Return Values and their Types – Function Calls – Function Declaration – Category of functions – No Arguments and No return values – Arguments but No return Values – Arguments with return values – No arguments but a return a value – Recursion – Passing Arrays to functions – Passing Strings to functions – The Scope, Visibility and lifetime of a variables. Structures and

Unions:- Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Arrays of structures –Unions. (14L)

Unit – V: POINTERS AND FILES

Pointers:- Understanding pointers – Accessing the Address of a Variable – Declaring Pointer Variables – Accessing a variable through its pointer – Pointer Expressions –Pointers as function arguments. File Management in C:- Defining and Opening a file – Closing a File – Input/output Operations on files – Error Handling during I/O Operations. (12L)

Text Book:

Programming in ANSI C – 6th Edition by E Balagurusamy – Tata McGraw Hill Publishing Company Limited.

Reference Books:

1. Computer System and Programming in C by Manish Varhney, Naha Singh – CBS Publishers and Distributors Pvt Ltd.
2. Introduction to Computer Science, IITL Education Solutions Limited, Second Edition, Pearson Education
3. Computer Basics and C Programming by V. Rajaraman – PHI Learning Private Limited
4. Programming with C, Third Edition, Byron S Gottfried, Tata McGraw Hill Education Private Limited.

Programming in C

L T P C
0 0 4 2

Objective: To develop skills in implementing algorithms through the programming Language C and to explore the features of C by applying sample problems.

Each exercise should be completed within two hours.

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. To find all possible roots of a quadratic equation using if statement
2. Program to check vowel or consonant using switch case statement
3. Evaluate Sine series using while loop
$$\sin(x) = x - x^3/3! + x^5/5! - \dots - x^n/n$$
4. Sort a list of numbers in ascending order
5. Search an element in an array
6. Reverse a number
7. Check the given string is palindrome or not
8. Find the binomial coefficient (nC_r) value using recursion
9. Multiply two matrices (check for compatibility)
10. Transpose of a matrix
11. Find the sum of 'n' numbers by making function call
12. Alphabetical sorting (passing array as argument to function)
13. Exchange values using pointers and function
14. Prepare the student details using structure
15. Prepare mark sheet using file

Discrete Mathematics

L T P C
3 0 0 3

Objective: To apply basic concepts for clear understanding of mathematical principles and to solve practical problems.

Unit – I: RELATIONS

Introduction to Relations – Binary relation – Classification of Relations – Composition of Relations – Inverse of Relation – Closure operation on Relations – Matrix representation of Relation - digraphs. **(9L)**

Unit – II: FUNCTIONS

Introduction to Functions – Addition and Multiplication of Functions - Classifications of Functions – Composition of Function – Inverse Function. **(6L)**

Unit – III: MATHEMATICAL LOGIC

Introduction – Statement (Propositions) – Laws of Formal Logic –Basic Set of Logical operators/operations - Propositions and Truth Tables – Algebra Propositions - Tautologies and Contradictions – Logical Equivalence – Logical Implication – Normal Forms. **(10L)**

Unit – IV: MATRIX ALGEBRA

Introduction – Definition of a Matrix - Types of Matrices – Operations on Matrices – Related Matrices – Transpose of a Matrix – Symmetric and Skew-symmetric Matrices – Complex Matrix – Conjugate of a Matrix – Determinant of a Matrix – Typical Square Matrices – Adjoint and Inverse of a Matrix – Singular and Non-singular Matrices – Adjoint of a Square Matrix – Properties of Adjoint of a Matrix – Properties of Inverse of a Matrix. **(10L)**

Unit – V: GRAPH

Introduction – Graph and Basic Terminologies – Types of Graphs – Sub Graph and Isomorphic Graph – Operations on Graphs – Representation of Graph. **(10L)**

Text Book:

DISCRETE MATHEMATICS, Swapan Kumar Chakraborty and Bikash Kanti Sarkar, OXFORD University Press.

Reference Books:

1. DISCRETE MATHEMATICS, Third Edition, Seymour Lipschutz and Marc Lars Lipson, Tata McGraw Hill Education Private Limited.
2. Discrete Mathematical Structures with Applications to Computer Science by J.P.Tremblay, R.Manohar TMH edition

Computer Basics

L T P C
0 0 4 2

Objective: To develop skills in implementing algorithms through the programming Language C and to explore the features of C by applying sample problems.

Each exercise should be completed within two hours.

It is compulsory to complete all the exercises given in the list in the stipulated time.

(Any open source Office or MS Office)

1. Usage of Numbering, Bullets, Indents and Headers in a Word Document
2. Prepare a Calendar in a Word Document
3. Design a wedding invitation in Word Document
Usage of Spell Check, Find and Replace Picture Insertion and Alignment
4. Prepare a semester wise mark statement for a computer class of 20 students using any spreadsheet' worksheet. Total, average and rank the student marks. Give proper headings. Make the column headings bold and italic.
5. Consider the sample employee worksheet and calculate their salary.
6. Use any spreadsheet to use mathematical, statistical and logical functions
7. Use any spreadsheet to plot a chart for marks obtained by the students (out of 5) vs. frequency (total number of students in class is 50).
8. Create a database for a Telephone Directory. Create a table named phone book with relevant fields. Enter a minimum of 10 records.
9. Create a student database and create validation rules for fields like age, date of birth, pincode etc.
10. Enter data to the student database using a form.
11. Create a query and add criteria to the query.
12. Create a tabular auto report.
13. Customize a report in report design.

Reference Books:

1. Microsoft Office 2016 Step By Step, Lambert, Joan , Frye, Curtis D., Phi Learning
2. Microsoft Access 2016 Step By Step, By Lambert, Joan Phi Learning
3. Microsoft Excel 2016 Step By Step, Curtis Frye, Phi Learning
4. Browse the Internet for Open Source Office Software

Object Oriented Programming in C++

L T P C
3 1 0 4

Objective: To gain the basic knowledge of object oriented programming concepts and to understand the detail idea of C++ streams, Inheritance, Overloading of operators, functions, constructors, File Handling and templates concepts of C++ programming.

Unit – I: Principles of Object Oriented Programming

Basic Concepts of Object Oriented Programming. **Classes and Objects:** Introduction – Specifying a Class – Defining Member Functions – Making an Outside Function Inline – Nesting of Member Functions - Private Member Functions – Static Data Members – Static Member Functions – Arrays of Objects – Objects as function arguments – Friendly Functions – Returning Objects . (12L)

Unit – II: Constructors and Destructors

Introduction – Constructors – Parameterized Constructors – Multiple Constructors in a class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructors – Dynamic Constructors – const objects - Destructors. (12L)

Unit – III: Operator Overloading, Type Conversions and Inheritance

Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators using Friends – Rules for Overloading Operators – Type Conversions. **Inheritance (Extending Classes):** Introduction – Defining Derived Class – Single Inheritance - Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes - Abstract Classes. (14L)

Unit – IV: Pointers, Virtual Functions and Polymorphism

Pointers - Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions - Pure Virtual Functions. **Managing Console I/O Operations:** Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O operations – Managing Output with Manipulators. (12L)

Unit – V: Files and Templates

Working with Files: Introduction – Classes for File Stream Operations – Opening and Closing a file – Detecting end-of-file – File Modes – Sequential Input and Output Operations.

Templates: Introduction - Class Templates – Function Templates. **(10L)**

Text Book:

Object Oriented Programming with C++, Sixth Edition by E. Balagurusamy, Tata McGraw Hill Publishing Company Limited.

Reference Book:

1. Programming with ANSI C++, Bhushan Trivedi, 2010, Oxford University Press
2. The Complete Reference C++, Fourth/ Fifth Edition Herbert Schildt, Tata McGraw Hill Publishing Company Limited.
3. Programming With C++ Third Edition by D. Ravichandran, Tata McGraw Hill Education, 2011.
4. Programming in C++ Second Edition by Ashok N. Kamthane, Pearson Education

Programming in C++

L T P C
0 0 4 2

Objective: To gain knowledge about the object oriented programming concepts and C++ streams, Inheritance, Overloading of operators, functions, constructors, File Handling and templates concepts of C++ programming by implementing sample programs.

Each exercise should be completed within three hours.

It is compulsory to complete all the exercises given in the list in the stipulated time.

- 1) Program with a Class and Member Functions.
- 2) Program to Overload Function.(minimum three geometric figures)
- 3) Program to implement Parameterized Constructor.
- 4) Program to implement Friend Function (minimum two classes)
- 5) Program to Overload Unary Minus Operator.
- 6) Program to Overload Binary Plus Operator.
- 7) Program to implement Multiple Inheritance for Family Details.
- 8) Program to implement Multilevel Inheritance for Bank Customer Details.
- 9) Program to implement Hierarchical Inheritance for Students Details.
- 10) Program to implement Virtual Function.

Digital Design

L T P C
3 0 0 3

Objective: To understand the concept of digital systems, to operate on various number systems and simplify Boolean functions and to distinguish logical and combinational circuits.

Unit – I: Number Systems, Codes and Digital Logic

Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code. **Digital Logic:** The Basic gates NOT, OR , AND – Universal Logic Gates NOR,NAND – AND-OR Invert Gates. (10L)

Unit – II: Combinational Logic Circuits

Boolean Laws and Theorems – Sum of Products Method – Truth Table to Karnaugh Map – Pairs, Quads and Octets – Karnaugh Simplifications – Don't Care Conditions – Product of Sums Method – Product of Sums Simplification. (10L)

Unit – III: Data Processing and Arithmetic circuits

Multiplexers – De-multiplexers – 1-of- 16- Decoders –BCD-to-Decimal Decoders – Seven-Segment decoders – Encoders – Exclusive-OR gates. **Arithmetic Circuits:** Binary Addition – Binary Subtraction – Unsigned Binary Numbers – Sign-Magnitude Numbers – 2's Complement Representation – 2's Complement Arithmetic. (10L)

Unit – IV: Flip-Flops

RS Flip Flops – Edge Triggered RS Flip Flops - Edge Triggered D Flip Flops - Edge Triggered JK Flip Flops – JK Master Slave Flip Flops. (8L)

Unit – V: Registers

Types of Registers – Serial in serial out – serial in parallel out – parallel in serial out – parallel in parallel out– Universal Shift Register. (7L)

Text Book:

Digital Principles and Applications, by Albert Paul Malvino & Donald P.Leach, Seventh Edition, Tata McGraw Hill Education Private Limited

Reference Book:

1. Fundamentals of Digital Circuits, A.Anand Kumar, Second Edition, PHI Learning Private Limited
2. Digital design, M.Morris Mano, Third Edition, Pearson Education

LINUX

L T P C
0 0 4 2

Objective: To understand and make effective use of Linux utilities and Shell scripting language to solve problems.

Each exercise should be completed within three hours.

It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Use any text editor in linux(say vi) to enter a C program to find the largest of three numbers, compile using gcc and display the output.
2. Use any text editor in linux(say vi) to enter a C program to find the factorial of a given number, compile using gcc and display the output.
3. Linux commands
 - a. ls, mkdir, rmdir, cd, pwd, find, du(Directory oriented)
 - b. cat, cp, rm, mv, wc (File oriented)
 - c. ps, kill, batch, grep(Process oriented)
 - d. write, mail, wall (Communication oriented)
4. Linux commands
 - a. date, who, who am i, man, cal, echo, bc(General purpose)
 - b. Pipe, Filter
5. Write a shell script to display date in the mm/dd/yy format, time, username and current directory.
6. Write a shell script to find the sum of digits of a given number.
7. Write a program to generate Fibonacci series.
8. Write a program to check whether given string is palindrome or not
9. Write a shell script to find factorial of a given integer.
10. Write a shell script to generate mark sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.

Reference Books:

1. Linux: A practical approach, B. Mohamed Ibrahim, Firewall Media
2. Comdex Linux and Open Office course kit revised and upgraded, Gupta, Wiley India.
3. A practical guide to Linux command, editors, and shell programming 2/e; Mark G Sobell, Prentice Hall.
4. Linux Lab - Open source Technology : Ambavade - Dreamtech