



மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்  
**MANONMANIAM SUNDARANAR UNIVERSITY**

**SYLLABUS FOR DIPLOMA IN SOFTWARE ENGINEERING  
PROGRAM OFFERED THROUGH DIRECTORATE OF VOCATIONAL  
EDUCATION (COMMUNITY COLLEGES AND VOCATIONAL SKILL DEVELOPMENT  
CENTRES) FROM 2019 – 2020**



கல்விசார் நிலைக்குழுக் கூட்டம்

**MEETING OF THE STANDING COMMITTEE ON  
ACADEMIC AFFAIRS HELD ON WEDNESDAY  
THE 22<sup>nd</sup> JANUARY 2020**

**DIPLOMA IN SOFTWARE ENGINEERING**

மென்பொருள் பொறியியல் பட்டயம்

**SCHEME OF EXAMINATION**

Subject Code	Title of the Course	Credit	Hours	Passing Minimum
<b>Semester I</b>				
C19SE11/E19SE01	Computer Fundamentals	6	90	40/100
C19SE12/E19SE02	Fundamentals of Software Engineering	6	90	40/100
C19SE13/E19SE03	Programming with C and C++	6	90	40/100
C19CE10/E19CE10	Communicative English	6	90	40/100
C19SEP1/E19SEP1	Practical II-C and C++ Programming Lab	4	120	40/100
<b>Semester II</b>				
C19SE21/E19SE04	Python Programming	6	90	40/100
C19SE22/E19SE05	Software Project Management	6	90	40/100
C19LS23/E19LS05	Life Skill	6	90	40/100
C19SEP2/E19SEP2	Practical II-Python Programming Lab	4	120	40/100
C19SEPW/E19SEPW	Internship/ Project	10	150	40/100

**Eligibility for admission:** Pass in 10<sup>th</sup> Std., examination conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamil Nadu or any other equivalent examination.

**Examination:** Passing Minimum for each Course is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the Courses and as given below:

- 40 % but less than 50 % - Third class
- 50 % but less than 60 % - Second class
- 60 % and above - First class

**Theory Paper**

Internal Marks-25

External Marks-75

**Syllabus****First Semester:-**

- Course I - Computer Fundamentals
- Course II - Fundamentals of Software Engineering
- Course III - Programming with C and C++
- Course IV - Communicative English
- Course V - Practical I-C and C++ Programming Lab

**Second Semester:-**

- Course VI - Python Programming
- Course VII - Software Project Management
- Course VIII - Life Skill
- Course IX - Practical II-Python Programming Lab
- Course X - Internship/Project

**\*(Semester Pattern for Community College Only)**

**Program Objective:**

- To understand the fundamentals of software engineering theory and develop a software application using programming languages.
- To develop the communication skill

**SEMESTER I****Course I****(C19SE11/E19SE01)Computer Fundamentals****Objective:**

- To learn about the computer organization and number system
- To gain knowledge on storage devices ,processor and memory of computer

**Unit I****18 Hrs****Introduction**

Introduction of computer-characteristics of computers-computer's evolution to their present form- computer generations -characteristic features of each computer generation

**Unit II****18 Hrs****Basic computer organization**

Basic operations of computer system- input- storage- output- processing- control-basic organization of a computer system-input unit-output unit - storage unit-processing unit

**Unit III****18 Hrs****Numbers and Data**

Non-positional number system-positional number system-decimal number system-binary number system-octal number system- hexadecimal number system-data types-alphabetic data- alphanumeric data-numeric data-computer codes: representation of data in binary- american standard code for information interchange (ASCII)-binary coded decimal (BCD) code

**Unit IV****18 Hrs****Processors and Memory**

Basic processor & memory architecture - central processing unit (CPU)- control unit (CU) - arithmetic logic unit (ALU) -instruction set-registers- processors-types- processor speed- main memory- RAM-ROM- cache

**Unit V****18 Hrs****Storage devices**

Primary storages- secondary storages-sequential access device- direct access devices-magnetic disks --hard-disks-zip disk -Winchester disk-optical disks-CD-rw- DVD-memory storage- devices-flash-drive-memory-card

**Outcome:**

After undergoing this course the students:

- ✓ Will be having thorough knowledge on digital computer fundamentals
- ✓ Can able to solve problems in number systems

**Reference Books:**

1. Computer Fundamentals, Pradeep K. Sinha & Priti Sinha, BPB Publications, Sixth Edition, 2017
2. Computer Fundamentals, Anita Goel, Pearson publishers, 2012
3. Fundamentals of Computers - Rajaraman V , Neeharika Adabala - Prentice Hall India Learning Private Limited; 6th edition (2014)

**Course II**  
**(C19SE12/E19SE02) Fundamentals of software engineering**

**Objective:**

- To learn the software life models and phases
- To learn about project planning and management techniques
- To study the types of software testing

**Unit I** **18 Hrs**

**Introduction**

The software engineering discipline- evaluation and impact- software development projects-program versus products- emergence of software engineering- early computing programming-high level language programming.

**Unit II** **18 Hrs**

**Software life cycle models**

Classical waterfall model- iterative waterfall model-prototyping model-evolutionary model-spiral model

**Unit III** **18 Hrs**

**Software project management**

Project planning- Software Project Management Plan (SPMP)-metrics for project size estimation- Lines of Code (LoC) - project estimation techniques

**Unit IV** **18 Hrs**

**Software design**

Design process - approaches to software design- function oriented- structured analysis- data flow diagram- structured design-object oriented-concepts- UML-use case- class-interaction-activity-state chart

**Unit V** **18 Hrs**

**Coding and testing**

Coding- coding review- software documentation-testing-unit testing- black box testing- white box testing- integration testing- system testing

**Outcome:**

After undergoing this course the students:

- ✓ Can understand the software life models and phases
- ✓ Can perform project planning and management
- ✓ Can understand the types of software testing

**Reference Books:**

1. Fundamentals of software engineering, Rajib Mall, PHI Learning; Fifth edition (2018)
2. Software Engineering, A practitioner 's approach, Roger S.Pressman, McGraw Hill Education- 7<sup>th</sup> edition (2017)

## Course III

### (C19SE13/E19SE03)Programming with C and C++

#### Objective:

- To enable the students to understand the programming concepts of C and C++ Language
- To enable the students to solve the problems using C and C++

#### Unit- I

18 Hrs

##### Introduction to C Programming

Introduction to the Course-Overview to C Programming -A Brief History of C- Running C Programs-The Edit-Compile-Link-Execute Process-Structure of C Programs-C's Character Set-The form of a C Program-The layout of C Programs-Pre-processor Directives-Your First Program-Add Comments to a Program

#### Unit-II

18 Hrs

##### Data Types in C

Data Types-Integer Number Variables-Decimal Number Variables-Character Variables-Assignment Statement-Arithmetic Ordering- Initializing Variables-Input and Output Functions-%Format -Formatting Your Output

#### Unit – III

18 Hrs

##### Arrays in C

Arrays- Pointers- Strings- Defining A New Type-Structures and Functions-Pointers to Structures-Malloc- Structures and C++-Header Files

#### Unit- IV

18 Hrs

##### Programming in C++

Fundamentals - Structure of Simple C++ Program- Fundamental Types, Constants, and Variables- Escape Sequences-Names- Variables- Keywords - Operators -Binary Arithmetic Operators-Unary Operators-Assignments-Relational Operators-Logical Operators.

#### Unit- V

18 Hrs

##### Storage Classes and Namespaces in C++

Storage Classes of Objects- The Storage Class extern-The Storage Class static-The Specifiers auto and register-The Storage Classes of Functions -Methods-Arrays-Inheritance -Polymorphism

#### Outcomes:

After learning this course, the students:

- ✓ Can able to understand the programming techniques of C and C++
- ✓ Can able to solve the problems using C and C++

#### Reference Books:

1. Introduction to C Programming – Second Edition - Oxford University Press – 2015
2. Programming in ANSI C - Balagurusamy- Tata McGraw-Hill Education, 2008

**Course IV**  
**(C19CE10/E19CE10)COMMUNICATIVE ENGLISH**

**Objective:**

- To learn the elements of communicative English
- To improve the reading , writing and spoken skills of communicative English

**1. Basic Grammar:**

- a. Review of grammar
- b. Remedial study of grammar
- c. Simple sentence
- d. Word passive voice etc.

**2. Bubbling Vocabulary:**

- a. Synonyms
- b. Antonyms
- c. One – work Institution

**3. Reading and Understanding English**

- a. Comprehension passage
- b. Précis – writing
- c. Developing a story from hints.

**4. Writing English**

- a. Writing Business letters.
- b. Paragraph writing
- c. Essay writing
- d. Dialogue writing

**5. Speaking English**

- a. Expressions used under different circumstances
- b. Phonetics

**Reference :**

1. V.H.Baskaran – “English Made Easy”
2. V.H.Baskaran – “English Composition Made Easy”  
(Shakespeare Institute of English Studies, Chennai)
3. N.Krishnaswamy – “Teaching English Grammar”  
(T.R.Publication, Chennai)
4. “Life Skill” – P.Ravi, S.Prabakar and T.Tamzil Chelvam,  
M.S.University, Tirunelveli.

**Course V**  
**Practical I**  
**(C19SMP1/E19SEP1)C and C++ Programming lab**

1. Write a C++ program to display the multiplication table.
2. Write a C++ program to find the sum of individual digits of a positive integer.
3. Write a C++ program to print whether a given number is prime or not
4. Write a C++ program to sort the names in ascending order
5. Write a C++ program to perform matrix addition, subtraction
6. Write a C++ program to solve a quadratic equation
7. Write a C++ program to find both the largest and smallest number in a list of integers.
8. Write a C++ program to construct of pyramid of numbers.
9. Write a C++ program that converts Roman numeral into an Arabic integer.
10. Write a C++ program to generate a Fibonacci series using copy constructor
11. Using overloading function write a C++ program to find the area of triangle and square
12. Write a C++ program, which overloads the binary operators so that two strings can be concatenated, and display the resultant string.

**SEMESTER II**  
**Course IV**  
**(C19SE21/E19SE04) Python Programming**

**Objective:**

- To learn the basics of Python Programming language

**UNIT – I Fundamentals 18 Hrs**

Fundamentals: Python character set, Tokens, variables and assignments, input output statements – Data Handling: Data types , operators, expressions.

**UNIT- II Conditional and Looping Statements 18 Hrs**

Conditional and Iterative Statements: If statement , if-else, if-elif and nested if statement – Looping statement : for loop, while loop, loop else, break and continue statement , nested loops.

**UNIT-III List and Tuples 18 Hrs**

List Creation and Access – List operations: Joining list, Repeating or Replicating List, Slicing the List, List functions and methods. Tuples: Tuple Creation and Access – Tuple Operations : Joining and Slicing the Tuples.

**UNIT-IV String and Dictionary 18 Hrs**

String Manipulation : - String operators : Basic operators , Membership Operators, Comparison operators , String Slices , string functions and methods. Dictionary - Creating, Accessing elements , characteristics. Working with Dictionaries: Adding elements, updating, deleting elements, Checking for existence of a key, Printing a Dictionary, Counting frequency of elements.

**UNIT –V Program Execution and Debugging 18 Hrs**

Basic flow of compilation , Understanding Translation Process – Role of Operating System in running a program – Debugging Techniques– Using Debugger Tool : Working with Integrated Debugger tool of Spider IDE- Working with Python Debugger-pdb- Errors and Exceptions.

**Outcomes:**

After completing this course, students

- ✓ Will understand the basics of Python
- ✓ Can able to solve problems using Python scripting

**Reference books:**

1. Computer Science with Python By Sumita Arora, Publisher LDHANPAT RAI & Co. Ltd., Educational and Technical Publisher,2018.
2. Python Programming An Introduction to Computer Science , Second Edition, JOHN ZELLE



## Course VII

### (C19SE22/E19SE05)Software Project Management

#### Objective

- To understand the project development methodology
- To gain knowledge in project management

#### **UNIT I: PROJECT EVALUATION AND PROJECT PLANNING** **18 Hrs**

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

#### **UNIT II : PROJECT LIFE CYCLE AND EFFORT ESTIMATION** **18 Hrs**

##### **PROJECT LIFE CYCLE**

Software process and Process Models – Choice of Process models – mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes –

#### **UNIT III** **18 Hrs** **EFFORT ESTIMATION**

Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points – COCOMO II A Parametric Productivity Model – Staffing Pattern.

#### **UNIT IV : ACTIVITY PLANNING AND RISK MANAGEMENT** **18 Hrs**

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.

#### **UNIT V : PROJECT MANAGEMENT AND CONTROL** **18 Hrs**

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

#### **REFERENCES:**

- Robert K. Wysocki “Effective Software Project Management” – Wiley Publication,2011.
- Walker Royce: “Software Project Management”- Addison-Wesley, 1998.

**Course VIII**  
**(C19LS23/E19LS05)Life Skill**

**Objective:**

- To understand the skills that are required for human life
- To develop the technical skills for employability

**I Life Coping or adjustment**

- (a) External and internal influence in one's life
- (b) Process of coping or adjustment
- (c) Coping with physical change and sexuality
- (d) Coping with stress, shyness, fear, anger for life and criticism.

**II Attitude**

- (a) Attitude
- (b) Self acceptance, self – esteem and self actualization
- (c) Positive thinking

**III Problem Solving**

- (a) Goal Setting
- (b) Decision Making
- (c) Time Management and stress Management.

**IV Computers**

- (a) Introduction to Computers
- (b) M.S.Office
- (c) Power Point

**V Internet**

- (a) Introduction to internet
- (b) E – mail
- (c) Browsing

**References:**

- 1) Life Skill Programme course I & II by Dr. Xavier Alphona MCRDCE Publications. R.K.Mutt Road, Chennai – 28
- 2) ஆளுமை பண்பு வளர்த்தல் மற்றும் தகவல் தொடர்பு by M.Selvaraj Community College,Palayamkottai
- 3) “Life Skill” –P.Ravi, S.Prabahar & T.Tamil Chelvam, M.S. University, Tirunelveli

## **Course IX**

### **Practical II**

#### **(C19SEP2/E19SEP2) Python Programming Lab.**

1. Write a python program to swap two numbers without using third variable
2. Write a python program to read two numbers and find the sum of their cubes
3. Write a python program to read three numbers and if any two variables are equal , print that number
4. Write a python program to read three numbers and find the smallest among them
5. Write a python program to read radius of a circle and print the area
6. Write a Python program to find the sum of all numbers in a list
7. Write a Python program to find the sum of all numbers in a list
8. Write a Python program to find the common numbers from two lists
9. Write a Python program to print all even numbers and another list of odd numbers from a given list
10. Write a Python program to remove repeated elements from a given list without using built-in methods.
11. Write a Python program to find the longest word in a given sentence.
12. Write a Python program to find the number of occurrences of all vowels present in a string.
13. Write a Python program to sort a given list of numbers without using sort() function.
14. Write a Python program to check whether the given string is palindrome or not.
15. Write a Python program to read a date (dd-mm-yyyy) and print the month name according to month number.
16. Write a Python program to find the factorial of a number using recursive function call.

## **Course X**

### **(C19SEPW/E19SEPW)INTERNSHIP/PROJECT**

Attend 10-15 days of internship training at small scale software industry and participate in application development. Produce a certificate for attending internship training.

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