

CITM
Crescent Institute of Technology & Management
Crescent Community College

DIPLOMA IN SOFTWARE ENGINEERING
SCHEME OF EXAMINATIONS

Subject Code	Title of the Paper	Credits	Hours	Passing Minimum
First Semester				
C17SE11	Computer Fundamentals	6	90	40/100
C17SE12	Fundamentals of Software Engineering	6	90	40/100
C17SE13	Programming with C & C++	6	90	40/100
C17CE10	Communicative English	6	90	40/100
C17SEP1	Practical: C and C++ Programming Lab	6	90	40/100
Second Semester				
C17SE21	Data Structures	6	90	40/100
C17SE22	Java Programming	6	90	40/100
C17SE23	Programming with Visual Basic	6	90	40/100
C17LS05	Life Skill	6	90	40/100
C17SEP2	Practical : Visual Basic Programming Lab.	6	90	40/100
Third Semester				
C17SE30	Computer Networks	6	90	40/100
C17SE31	Web Programming	6	90	40/100
C17SE32	Software Testing	6	90	40/100
C17SEP3	Industrial Visit/ Internship	6	90	40/100
C17SEP4	Practical : Web Programming Lab	6	90	40/100
Fourth Semester				
C17SE40	Relational Database Management Systems	6	90	40/100
C17SE41	Programming with ASP. Net	6	90	40/100
C17SEP5	Practical : ASP.Net lab	6	90	40/100
C17SEPW	Project Work	12	180	40/100

Eligibility for admission: Pass in 10thstd 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 paper is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the papers and as given below:

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

Syllabus

First Semester:-

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

Second Semester:-

- Paper VI - Data Structures
- Paper VII - Java Programming
- Paper VIII - Programming with Visual Basic
- Paper IX - Life Skill
- Paper X - Practical : Visual Basic Programming Lab.

Third Semester:-

- Paper XI - Computer Networks
- Paper XII - Web Programming
- Paper XIII - Software Testing
- Paper XIV - Industrial Visit/ Internship
- Paper XV - Practical : Web Programming Lab

Fourth Semester:-

- Paper XVI - Relational Database Management Systems
- Paper XVII - Programming with ASP,Net
- Paper XVIII - Practical : ASP,Net,Lab
- Paper XIX - Project Work

I SEMESTER

COMPUTER FUNDAMENTALS

Unit- 1 Introduction

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

Unit- 2 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 - 3 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- 4 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- 5 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

Reference Books:

- 1.Computer Fundamentals, Sinha & Sinha, 2007.
- 2.Computer Fundamentals, Anita Goel,Pearson publishers,2012.

Fundamentals of software engineering

Unit-1 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-2 Software life cycle models

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

Unit - 3 Software project management

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

Unit- 4 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-5 coding and testing

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

Reference Books:

- 1.Fundamentals of software engineering, Rajib Mall,PHI,2010
- 2.Software Engineering, a practitioner 's approach, Roger S.Pressman,2009.

Programming with C and C++

Unit- I 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 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 Arrays in C

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

Unit- IV 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 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

Reference Books:

- 1.Programming in C- Balagurusamy,2012.
- 2.The Complete Guide to Programming with C++ - Ulla kirch-Prinz Peter Prinz,2011.

Communicative English

Unit I: Learning context

Concept of learning – Learning style –Grammatical framework – sentence framing – paragraph and texts

Unit II: Reading

Basic concept – Purposes of reading-Decoding-Reading materials – Barriers of reading

Unit III: Writing

Basic concept-Writing style-Terminology-stages-English spelling and punctuation – Written texts

Unit IV: Speaking

Language functions-Conversation- Features of spoken English – Types of English course: functional English, English literature, advance English – Phonetic

Unit V: Developing Communication Skills

Meaning –Classroom presence- Features of developing learning process- Practical skills and Listening- uses of communicative English

References

1. Raman,m.&S.Sharma (2011) communication skills,OUP,New Delhi: India
2. Lata,P.&S.Kumar(2011) communication skills,OUP,New Delhi: India,
- 3.Leech,G&J.Svartvik(2002) A communicative grammar of English,Pearson,India,
4. Sethi,J. and P.V. Dharmija (2007) A course in Phonetics and spoken English.Second edition, Prentice hall: New Delhi

Practical-1: C and C++ Programming lab

1. Write C programming to Add Even numbers
2. Write C programming to perform Addition,Subtraction,Multiplication,and Division
3. Write C programming for Decimal to Binary conversion
4. Write a c++ program to display multiplication table.
5. Write a c++ program to print whether a given number is prime or not
6. Write a c++ program to sort the names in ascending order
7. Write a c++ program to perform matrix addition, subtraction
8. Write a c++ program to solve a quadratic equation
9. Write a c++ program to generate a fibonacci series using copy constructor
10. Using overloading, write a function to find the area of triangle and square
11. Write a c++ program, which overloads the binary operators so that two strings can be concatenated, and display the resultant string.

II Semester

Data structures

Unit-I Basic Concepts

Overview: System Life Cycle- Algorithm Specification- Introduction- Recursive Algorithms- Data Abstraction-Performance Analysis

Unit-II Data types

The Array as an Abstract Data Type-The Polynomial Abstract Data Type-The Sparse Matrix Abstract Data Type-Introduction-Matrix Multiplication-The Representation of Multidimensional Arrays-The String Abstract Data Type- Introduction- Pattern Matching

Unit-III STACKS AND QUEUES, LINKED LISTS

The Stack Abstract Data Type-The Queue Abstract Data Type- Evaluation of Expressions- Evaluating Postfix Expressions- Infix to Postfix-Dynamically Linked Stacks and Queue - Polynomials-Representing Polynomials.

Unit-IV TREES and HEAP

Introduction-Representation of Trees-Binary Trees-The Abstract Data Type-Properties of Binary Trees-Binary Tree Representation-Binary Tree Traversals-Heaps-The Heap-Insertion into a max heap-Deletion from a max heap

Unit-V GRAPHS

The Graph Abstract Data Type-Introduction- Definitions- Graph Representations- Elementary Graph Operations- Depth First Search-Breadth First Search- Connected Components- Spanning Trees

Reference Books

- 1.Fundamentals of data structures in C - Ellis Horowitz, Sartaj Sahni, Susan Anderson Freed.
- 2.Data Structures Made Easy,Narasimha Karumanchi,2011.

Java Programming

Unit - I

The Mental Landscape- The Fetch-and-Execute Cycle: Machine Language-Asynchronous Events: Polling Loops and Interrupts- Objects and Object-oriented Programming- The Modern User Interface-The Internet and World Wide Web

Unit - II Names and Things

The Basic Java Application-Variables and the Primitive Types- Strings, Objects, and Subroutines- Text Input and Output- Control-Blocks, Loops, and Branches- The while and do-while Statements- The for Statement-The if Statement- The switch Statement

Unit- III Objects and Classes

Objects, Instance Variables, and Instance Methods-Constructors and Object Initialization-Programming with Objects- Inheritance, Polymorphism, and Abstract Classes

Unit IV GUI programming

Applets, HTML, and GUI's: The Basic Java Apple- HTML Basics and the Web-Graphics and the Paint Method- Mouse Events- Keyboard Events.

Unit- V Advanced GUI Programming

More about Graphics- More about Layouts and Components- Standard Components and Their Events-Programming with Components- Threads, Synchronization, and Animation - Frames and Dialogs.

Reference Books :

- 1.Java programming - David J.Eck ,2009
- 2 Java 2 Complete Reference, Herbert Schildt , 2011.

Programming with Visual Basic

Unit -I Visual Basic programming

Starting Visual Basic - Creating a New Project - Changing the Characteristics of Objects - Adding controls to a form- Designing an interface- Writing the code behind an interface- Understanding properties -Understanding Methods -Understanding collections

Unit- II Understanding Events

Understanding Event Driven programming-Building an event example project- -Building an user interface - Changing the name of a form- Changing the appearance of a form - showing and hiding forms.

Unit - III Working with Traditional Controls

Displaying static text with the label control- Allowing users to enter text using a text box- Creating Buttons- Creating containers and groups of option buttons- Creating a list with list box- Creating- Drop_Drown lists using the combo Box.

Unit IV Adding Menus and Toolbars to Forms

Building Menus- Using the Toolbar Control- Creating a status bar- Using Constants, data types,variables, and arrays-Understanding data types- defining and using constants-Declaring and Referencing variables- Working with arrays- using variables in your picture viewer project.

Unit - V Desiging objects using classes

Understanding Classes-Instantiating object from classes-Working with graphics-Understanding the graphics object-Working with pens- Using system colors-Working with Rectangles-Drawing shapes-Drawing text.

Reference Books

- 1.Visual Basic- Marion Cottingham- Peachpit Press,2010.
- 2.Beginning Visual Basic,Bryan Newsome, 2015

LIFE SKILL

(Common to All Courses)

UNIT- I ATTITUDE : Positive thinking – Goal setting – Problem Solving and Decision making – Leadership and Team Work.

UNIT- II COMMUNICATION SKILLS: Oral communication: Concept of English language – Fluency – Verbal communication in official and public situations.

UNIT-III COMMUNICATION SKILLS: Written Communication: Comprehension – Writing a formal letter like application for Job, enquiry, reply, complaint and such others – preparation of Resume, Curriculum Vitae.

UNIT- IV COMPUTING SKILLS – 1: Introduction to Computers, its various components and their respective functions – Memory storage devices – Microsoft (MS) Office – MS Word.

UNIT - V COMPUTING SKILLS – 2 Internet Basics – Origin of Internet – MODEM – ISP – Upload – Download – e-mail – Origin of worldwide web (www) Browsers – Search engines.

Reference books:

Life skill, Manonmaniam Sundaranar University Publications Division (2011)

Practical-2: Visual Basic Programming Lab

1. Write a program to calculate the telephone bill for the following range.
 - a. Below 200 - rs.0.80
 - b. 201 to 400 - rs.1.00
 - c. 401 to 700 - rs.1.25
 - d. Above 700 - rs.1.50

(using if statement)
2. Write a program to get employee details such as code, name, sex, department, salary. You have to calculate DA, HRA, PF, tax and net amount. (using if statement)
 - a. DA = 16% of bp
 - b. HRA = 12% of bp
 - c. PF = 10% of bp
 - d. Tax is calculated as follows

Dept	Salary	Tax
Computer	Above 10000	10% of bp
Computer	5000 to 10000	13.5% of bp
Computer	Below 10000	9% of bp
Sales	Above 10000	15% of bp
Sales	5000 to 10000	10% of bp
Sales	Below 10000	Nil
Accountant	Above 10000	15.5% of bp
Accountant	5000 to 10000	9.5% of bp
Accountant	Below 10000	7% bp

3. Write a program to get student details such as name, reg.no, marks for 4 subjects. You have to calculate total, average and grade. Grade is evaluated as follows.
 - a. Above 90 - outstanding
 - b. 80 to 90 - distinction
 - c. 60 to 79 - first class
 - d. 40 to 59 - second class
 - e. If anyone marks is <40 - fail (using select case)
4. To generate prime numbers within a given range
5. To check a number is armstrong or not
6. To convert binary number into decimal number and vice versa
7. To find sum of two numbers
8. To find first, second biggest numbers in an given array
9. To get array of values and check whether a particular number is found in your array or not. Display number of occurrences also.
10. To arrange a given set of number in ascending and descending order.
11. Write a program to format a text.

III Semester

COMPUTER NETWORKS

1. INTRODUCTION

Building a network – Requirements – Network Architecture – OSI – Internet – Direct Link Networks – Hardware building blocks – Framing – Error detection – Reliable transmission.

2. NETWORK FUNDAMENTALS

LAN Technology – LAN Architecture – BUS/Tree – Ring – Star – Ethernet – Token Rings – Wireless.

3. NETWORK LAYER

Packet Switching – Switching and Forwarding – Bridges and LAN switches – Internetworking – Simple Internetworking – Routing.

4. TRANSPORT LAYER

Reliable Byte Stream (TCP) – Simple Demultiplexer (UDP) – TCP Congestion Control – Congestion Avoidance Mechanisms.

5. PRESENTATION LAYER and APPLICATIONS

Presentation formatting – Data compression – Cryptographic Algorithms: RSA - DES — Applications – Domain Name Service – Email - SMTP – MIME – HTTP – SNMP.

Reference Books:

- 1.Computer Networks - A systems Approach- Larry L. Peterson & Bruce S. Davie Harcourt Asia/Morgan Kaufmann,2013
- 2.Computer Networks, Andrew Tanenbaum,2013.

Web Programming

Unit-I Introduction

Designing Web Pages with HTML-The HyperText Markup Language - Steps to Publish a Document on the Web -Create the Document -Put the Document on the Web -Validate the Document - The Basic Structure of HTML Document

Unit- II Block-Level Elements in HTML

Headings -Basic Text Elements -Basic Paragraphs -Paragraphs with White Space -Numbered, Bulleted, and Indented Lists-Numbered Lists- Bulleted Lists -Definition Lists -Tables -The Basic Table Structure -Defining Table Rows- Table Headings and Data Cells -Grouping Table Contents

Unit - III Text-Level Elements in HTML

Physical Character Styles -Logical Character Styles - Specifying Hypertext Links -Embedded Images -Animated GIFs The IMG Element -Embedding Other Objects in -Embedded Scrolling Text Banners .

Unit -IV Frames

Frame Document Template -Specifying Frame Layout -Specifying the Content of Frame Cells - Examples -Targeting Frame Cells -Predefined Frame Names - Printing Frames -Updating Multiple Frame Cells Simultaneously -Creating Empty Frame Cells.

Unit - V Cascading Style Sheets

Specifying Style Rules -Using External and Local Style Sheets-External Style Sheets -The STYLE Element and JavaScript Style Sheets-Inline Style Specification-Selectors -- Layers-Specifying Layers with the LAYER Element -Specifying Layers with Style Sheets

Reference Books

- 1.Core Web Programming - Second Edition by Marty Hall and Larry Brown , Sun Microsystems Press/Prentice Hall
- 2.Web Programming Building internet Applications ,Chris Bates,2006.

SOFTWARE TESTING

Unit - I Types of Testing

Static Testing-Structural Testing - Block box testing- Requirements based testing-Positive and Negative testing -Decision tables- Domain testing-Integration testing

Unit - II System and Acceptance Testing

System testing overview-Functional System Testing -Design/Architecture verification-Business vertical testing-Deployment testing-Beta testing-Non Functional Testing-Scalability testing-Reliability testing-Stress testing-Performance testing

Unit - III Regression Testing

Types of Regression testing - Methodology for selecting test cases -Concluding the results of regression testing-Internationalization testing -Fake language testing- Localization testing.

Unit - IV Test Planning, Management, Execution and Reporting

Introduction - Test Planning-preparing a test plan- Identifying Responsibilities, staffing and Training Needs-Identifying Resource Requirements-Test Management-Test Reporting.

Unit - V Software Test Automation

Test Automation-Terms used in Automation-Design and Architecture for Automation-Test Metrics and Measurements-What are Metrics and Measurements- Metrics in testing-Types of metrics-Project Metrics-Progress metrics.

Reference Books

- 1.“Software Testing – Principles and Practice- Srinivasan Desikan and Gopaldaswamy Ramesh,- Pearson Education
- 2.Ron Patton, “Software Testing, Sams Publishing, Pearson Education,2016.

Practical-3 : Industrial visit/Internship

Practical 4: Web Programming Lab

1. Practicing elements, Tags and basic structure of HTML
2. Practicing basic and advanced text formatting.
3. Designing of webpage-Working with List.
4. Designing of webpage-Working with Tables.
5. Practicing Hyper linking of webpages.
6. Designing of webpage- working with Frames.
7. Designing of webpage- working with Forms and Controls.
8. Practicing creation of style sheets, CSS properties and styling.
9. Working with Background, Text and Font properties.
10. Working with list properties
11. Designing with cascading style sheet-Internal and external style sheets

IV-Semester

Relational database Management Systems

UNIT – I: AN OVERVIEW OF DBMS

Introduction – Data – Information – Database – Goals of DBMS – Characteristics of DBMS – Types of DBMS – Advantages and Disadvantages of DBMS.

UNIT – II: RELATIONAL DATABASE MANAGEMENT SYSTEM

Introduction to RDBMS –Terminology – Relational Data Structure – Data Integrity – Design Constraints – Primary Key – Foreign Key and its Constraints.

UNIT – III: ER MODELLING

Introduction to Entity Relationship Modeling – ER Model – Entities – Attributes – Types of Attributes – ERD Conventions – Relationships – Degree – Connectivity – Cardinality – Dependency – Participation.

UNIT – IV: STRUCTURED QUERY LANGUAGE

Introduction to SQL – Characteristics of SQL – Data types – Types of SQL Commands – Data Definition Language (DDL) – Data Manipulation Language (DML) – Data Control Language (DCL) - SQL Operators (Arithmetic Operator – Comparison Operator – Logical Operators and Set Operators).

UNIT – V: WEB DATABASE

Introduction to Internet – E-Com – Web Browser – Accessing Database on the Web Browser – Tools required for Web Database – Internet Information Server (IIS) – Object Linking Embedding Data Base (OLEDB) provider – ActiveX Database (ADO) Connection.

Reference Book:

1.Database System Concepts- Abraham Silberschatz, Henry Korth, and S. Sudarshan.

Programming with ASP.Net

Unit - I ASP.NET and the .NET Framework

The .NET Framework-ASP.NET-Hello World- Visual Studio .NET-Start Page-projects and Solutions-The Integrated Development Environment (IDE)-Building and Running- Events-Event Model-ASP Versus ASP.NET Events-Event Arguments-Application and Session Events-Page and Control Events.

Unit - II Controls

HTML Server Controls-ASP (Web Server) Controls- ASP Control Details-Label Control-Text Box Control-Button Controls-HyperLink Control-Selecting Values-Selecting from a List-Tables-Panel Control-Images-Calendar.

Unit - III Programming Web Forms

Code-Behind- Creating the Sample Application- Debugging-Error Handling- Validation-The RequiredFieldValidator-The Summary Validator-The Compare Validator-Range Checking-Regular Expressions-Custom Validation.

Unit - IV Data Binding

ArrayList-Data Binding and Postback-Binding to a Class-Binding to Other Simple Controls-Binding Radio Buttons and Checkboxes- List-Bound Controls-The DataGrid Control.

Unit -V Accessing Data with ADO.NET

Getting started with ADO.NET -Creating a Data Grid-Creating Data Objects by Hand-Stored Procedures- ADO Data Updates-Updating with SQL-Updating Data with Transactions-Updating Data Using Datasets

Reference Books

- 1.ASP.NET in simple steps- Kogent Learning Solutions –Dream Press Tech.
- 2.The Complete Reference,Matthew MacDonald,2002.

Practical-5: ASP.NET Lab

1. Create a simple ASP.NET page to Output Text with a form, two HTML text boxes, an HTML button, and an HTML element. Create an event procedure for the button.
2. Create a web application in ASP.NET using three different controls to the ASP.NET page for reserving rooms in hotel. The three controls are a button control, a label control, and a drop-down list control.
3. Develop a ASP.Net application using Datagrid to display records.
4. Develop a database application using ADO.NET to insert, modify, update and delete operations.
5. Develop a ASP.Net application to perform timer based quiz of 10 questions.
6. Write a program to implement a calculator with memory and recall operations.
7. Write a VB.Net program to accept a string and convert the case of the characters.
8. Create a application for Accessing a SQL Database by Using ADO.NET by connecting to the SQL Server database and call a stored procedure. You then display the data in a Repeater control
9. Develop a database application to store the details of students using ADO.NET
10. Develop a menu based ASP.Net application to implement a text editor with cut, copy, paste, save and close operations.

Project work: