



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC | Approved by AICTE



Minutes of Board of Studies Meeting

Date: 10.05.2021 **Time:** 11.00 am **Mode:** Virtual

Minutes of the BOS Meeting -2021 held on 10-05-2021

Agenda:

1. Review of 2015 and 2019 curriculum.
2. Updating the course contents
3. Approval of Customer Interface Design and Development, Customer Interface Design and Development Lab, Fog and Cloud Computing, User Interface design and Development

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

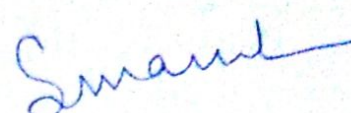
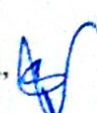
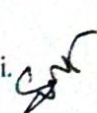
- Contents of the following Programming in Java Lab has been changed based on the feedback given by students and faculty members and students.
- The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.
 1. *SITA1502-Customer Interface Design and Development*
 2. *SITA2501-Customer Interface Design and development Lab*
 3. *SITA4001-User Interface Design and Implementation*
 4. *SITA3011-Block Chain technologies*
 5. *SITA1503-Fog and Cloud Computing*

Convener: Dr.T.Sasikala, Dean, School of Computing

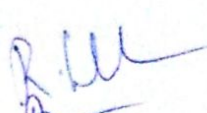


External Members:

Academic Expert

- Mr. Somasundaram, Vice President, Maveric Systems, Chennai. 
- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR, Chennai. 
- Mr.SingaraveluEkambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai. 

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT 
- Dr.P.Jeyanthi, Associate Professor, IT 
- Dr.Maria Anu ,Associate Professor, IT 
- Dr.S.Revathy, Associate Professor, IT 

Note: Removed Contents are marked in Yellow color and Added Contents are marked in red color

SITA2301	PROGRAMMING IN JAVA LAB	L	T	P	Credits	Total Marks
		0	0	2	1	100

COURSE OBJECTIVES

- To implement Object Oriented concepts in Java.
- To implement Packages, Interfaces and Multithreading Concepts.
- To develop applications using lang and io packages.
- To design web based application.
- To design GUI application design using swing controls.

SUGGESTED LIST OF CYCLE -1

1. Using Classes and Objects.
2. Types of Constructors
 - Default Constructor.
 - Parameterized Constructor.
 - Copying values from one object into another object.
 - Constructor Overloading.
3. Inheritance
 - Single Inheritance.
 - Multilevel Inheritance.
 - Hierarchical Inheritance.
4. Using Super Keyword
 - To access Property.
 - To access method.
 - To access Constructors.
5. Using final keyword.
6. Abstract Class Programs.
 - 6.1 Write a java program that illustrates the example for abstract class.
7. Multiple inheritances through interface.
8. A class implements interface but one interface extends another interface.
9. Inheritance interface.
10. Default & Static method in interface.
11. Packages
 - Import package.
 - Import package. Class name
 - Fully Qualified name.
12. Exception Handling programs.
 - Write a java program that describes the exception handling mechanism.
 - Write a java program that describes the user defined exception.
 - Write a java program that describes multiple catch blocks.
13. Write a program to implement the concept of threading by extending Thread Class.
14. Write a program to implement the concept of threading by extending Thread Class.
15. Write a program to implement the concept of threading by implementing Runnable Interface.
16. Build and run a program in which threads are synchronized through synchronized method.

CYCLE 2

1. Write a Java Program to implement Wrapper classes and their methods.
2. By using
 - a. Input Stream and Output Stream classes
 - b. Reader and Writer Classes
 - c. Data Output Stream and Data Input Stream classes.
3. Write a java program that describes the life cycle of an applet.
4. A java program for event handling
5. A Java Application Programming Interface by using swing controls
6. A java program for database connectivity and design the front using SWING controls.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Ability to implement application programs using java object oriented concepts.
- CO2 - Able to implement interface, package and multithread concepts.
- CO3 - Understand various built in packages and its applications.
- CO4 - Knowledge on designing web based applications using applet programming.
- CO5 - Create applications using Swing controls in real time applications.
- CO6 - Able to connect frontend and backend using database connectivity.

SITA2302	PROGRAMMING IN JAVA LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To implement Object Oriented concepts in Java
- To implement Packages, Interfaces and Multithreading Concepts.
- To develop applications using lang and io packages.
- To design web based application.
- To design GUI application design using swing controls.

CYCLE -1

1. Write a Java program using Classes and Objects.
2. Write a java Program using various types of Constructors.
3. Implement the concept of following kinds of Inheritance for Employee Application
 - Single Inheritance.
 - Multilevel Inheritance.
 - Hierarchical Inheritance.
4. Write a Java Program to access various members of super class using Super Keyword
5. Write a java program that illustrates the example for abstract class.
7. Write a java program to find area of various shapes using interface.
8. Write a java Program to create custom package to implement calculator operations.
9. Write a java program that describes the exception handling mechanism.
10. Write a java program that describes the user defined exception.
11. Write a program to create thread by extending Thread Class or by implementing Runnable Interface.
12. Write a java program to create copy of a given object using ICloneable interface.

CYCLE -2

13. Write a Java Program to implement Wrapper classes and their methods.
14. Write a java program for handling input and output operations using,
 - a. Input Stream and Output Stream classes
 - b. Reader and Writer Classes
 - c. Data Output Stream and Data Input Stream classes.
15. Write a java program that describes the life cycle of an applet.
16. Write a java program to pass parameters to Applet and display the output.
17. Write a java program for event handling using awt controls
18. Write a Java program to handle Mouse and Key events
19. Create a Java Application Programming Interface by using swing controls
20. Write a java program for database connectivity using JDBC.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Ability to implement application programs using java object oriented concepts
- CO2: Able to implement interface, package and multithread concepts
- CO3: Understand various built in packages and its applications
- CO4: Knowledge on designing web based applications using applet programming
- CO5: Create applications using Swing controls in real time applications.

CO6: Able to connect frontend and backend using database connectivity.



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Minutes of Board of Studies Meeting

Date: 10.12.2021

Time: 11.00 am

Mode: Physical

Minutes of the BOS Meeting -2021 held on 10-12-2021.

Agenda:

1. Review of 2015 and 2019 curriculum.
2. Updating the course contents of Existing Courses and Introduction of new courses

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

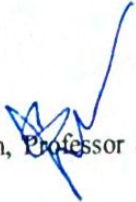
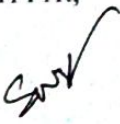
- Contents of the following courses have been changed based on the feedback given by students and faculty members and students.
 1. *Mobile Application Development*
 2. *Mobile Application Development Lab*
- The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.
 6. *SITA2602-Big Data Analytics Lab*
 7. *SITA3009-Cyber Forensics and Cyber Law*
 8. *SITA3010-Natural Language Processing*

Convener: Dr.T.Sasikala, Dean School of Computing



External Members:

Academic Expert

- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR, Chennai. 
- Mr.SingaraveluEkambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai. 
- Mr. Somasundaram, Vice President, Maveric Systems, Chennai. 

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT 
- Dr.P.Jeyanthi, Associate Professor, IT 
- Dr.Maria Anu ,Associate Professor, IT 
- Dr.S.Revathy, Associate Professor, IT 

SIT1402	MOBILE APPLICATION DEVELOPMENT	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION AND UI INTERFACE

9 Hrs.

Introduction to mobile technologies, mobile operation systems, Mobile devices - pros and cons, Introduction to Android, Versions, Features, Architecture, UI Widgets and Events handling, Layouts, Required tools - Eclipse, ADT, AVD, Application structure, Android Manifest file, Android design philosophy, Creating Android applications.

UNIT 2 BUILDING BLOCKS AND DATABASES

9 Hrs.

Introduction to Activities and Intents - Understanding Activity life cycle, Linking Activities, Passing Data, Toast, Displaying a Dialog Window and Notifications. Content Provider, Services, Broadcast receivers, accessing databases, sample applications, debugging and deploying app, publish in Playstore.

UNIT 3 OBJECTIVE C PROGRAMMING

9 Hrs.

Objective C - Data Types and Expressions, Decision Making and Looping, Objects and Classes, Property, Messaging, Categories and Extensions, Fast Enumeration - NSArray, NSDictionary, Methods and Selectors, Static & Dynamic objects, Exception handling, Memory management, **Required Tools - Xcode, iOS Simulator, Instruments, ARC, frameworks.**

UNIT 4 INTRODUCTION TO iOS

9 Hrs.

Introduction to iPhone, History, Versions, Features, MVC Architecture, View Controller - Building the UI and Event handling, Application life cycle, Tab Bars, Story Boards and Navigation Controllers, Table View, Push Notification, Database handling, Debugging and Deployment, Publishing app in Appstore, sample applications.

UNIT 5 WINDOWS MOBILE APP DEVELOPMENT 9 Hrs.

Introduction to Windows Phone 8, Application Life cycle, UI Designing and events, Building, Files and Storage, Network Communication, Push Notification, Background Agents, Maps and Locations, Data Access and storage, Introduction to silverlight and XAML, Running and Debugging the App, Deploying and Publishing.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Comprehend various mobile technology and business trends in mobile applications.
- CO2 : Develop the mobile applications using various controls.
- CO3 : Explore Objective C and sketch out the different built in blocks
- CO4 : Assess and deploy Iphone OS and apps
- CO5 : Design mobile applications using emulators.
- CO6 : Create applications to hand-held devices

TEXT / REFERENCE BOOKS

- 1.Reto Meier, "Professional Android Application Development", Wrox Edition.
- 2.<http://www.tutorialspoint.com/android/index.htm>
- 3.<http://developer.android.com/training/index.html>
- 4.Stephen G. Kochan, "Programming in Objective C", Addition Wesley, 4th Edition.
- 5.David Mark, Jack Nutting and Jeff LaMarche, "Beginning iOS 5 Development", Apress Edition.
- 6.Baijian Yang, Pei Zheng, Lionel M. Ni, "Professional Microsoft Smartphone Programming", Wrox Edition.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each - No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SITA1601	MOBILE APPLICATION DEVELOPMENT	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand basic concepts of mobile technologies, different operating systems and how to work with Android .
- To develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle.
- To learn how to code with objective C programming.
- To design, implement and deploy mobile applications for iOS .
- To design, implement and deploy mobile applications for windows OS.

UNIT1 INTRODUCTION TO ANDROID

9 Hrs.

Introduction to mobile technologies, mobile operation systems - pros and cons, Introduction to Android, Features, Architecture, UI Widgets and Events handling, Layouts, Application structure, Android Manifest file, Creating Android applications.

UNIT2 BUILDING BLOCKS AND DATABASES

9Hrs.

Introduction to Activities and Intents - Understanding Activity life cycle, Linking Activities, Passing Data, Toast, Displaying a Dialog Window and Notifications. Content Provider, Services, Broadcast receivers, accessing databases, Location and sensors, Multimedia audio, video and camera, Deploying and publishing application.

UNIT3 OBJECTIVE C PROGRAMMING

9 Hrs.

Objective C - Objects and Classes, Property, Messaging, Categories and Extensions, Fast Enumeration - NSArray, NSDictionary, Methods and Selectors, Static & Dynamic objects, Exception handling, Memory management, **Swift language essentials: Arrays, Dictionaries, functions.**

UNIT4 INTRODUCTION TO IOS

9Hrs.

Introduction to iPhone, MVC Architecture, View Controller - Building the UI and Event handling, Application life cycle, Tab Bars, Story Boards and Navigation Controllers, Table View, Push Notification, Database handling, **Introduction to icloud, Webkit framework in iOS8**, Deploying and publishing application.

UNIT 5 WINDOWS MOBILE APP DEVELOPMENT

9 Hrs.

Introduction to Windows Phone 8, Application Life cycle, UI Designing and events, Building, Files and Storage, Network Communication, Push Notification, Background Agents, Maps and Locations, Data Access and storage, Introduction to silverlight and XAML, Data Binding, Deploying and Publishing.

MAX. 45 Hours.

COURSE OUTCOMES:

On completion of the course, student will be able to

- CO1: Understand the technologies and business trends impacting mobile applications.
- CO2: Understand and remember the components of android, iOS and Windows mobile applications.
- CO3: Learn the programming languages and techniques for developing mobile applications.
- CO4: Develop mobile applications with compelling user interface and database connectivity for real time applications for iOS.
- CO5: Deploy mobile applications with compelling user interface and database connectivity for real time applications for Windows OS.
- CO6: Develop and deploy mobile applications using silverlight .

TEXT / REFERENCE BOOKS:

1. Reto Meier, "Professional Android Application Development", Wrox, 2010.
2. <http://www.tutorialspoint.com/android/index.htm>
3. <http://developer.android.com/training/index.html>
4. Stephen G. Kochan, "Programming in Objective C", Dorling Kindersley India Pvt.Ltd, 2012.
5. David Mark, Jack Nutting and Jeff LaMarche, "Beginning iOS 6 Development Exploring the iOS SDK", Apress, 2013.
6. Henry Lee, Eugene Chuvyrov, " Beginning Windows Phone App Development", Apress 2012.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Part A: 10 questions carrying 2 marks each – No choice

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

Exam Duration:3 Hrs.

20 marks

80 marks

SIT4402	MOBILE APPLICATION DEVELOPMENT LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

1. To implement mobile application life cycle methods.
2. To implement simple calculator application.
3. To implement simple SMS application.
4. To implement authentication verification application without and with database.
5. To implement navigation application with multiple pages / activities.
6. To implement student placement registration form with database.
7. To implement a simple notification application.
8. To implement simple intent with data passing application.
9. To implement simple profile changer application through SMS.
10. To create mobile web browser application.
11. To create mobile e-mail application to sent a mail.
12. Mini project.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Build applications with GUI components using appropriate mobile application life cycle method.
- CO2 : Design reliable message passing applications employing various widgets, broadcast receivers and toast in android.
- CO3 : Develop event handlers and intent to link various database to mobile applications.
- CO4 : Build interactive mobile applications by importing web application concepts.
- CO5 : Create an e-mail application with the help of android software development packages
- .CO6 : Create mobile applications for real world requirements.

SITA2601	MOBILE APPLICATION DEVELOPMENT LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle.
- To learn how to utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
- To understand the programming languages and platform for developing mobile applications.
- To design, implement and deploy mobile applications using an appropriate software development environment.
- To upload the developed application into the Android play store.

LIST OF EXPERIMENTS:

1. To implement mobile application life cycle methods.
2. To implement simple calculator application.
3. To implement simple SMS application.
4. To implement authentication verification application without and with database.
5. To implement navigation application with multiple pages / activities.
6. To implement student placement registration form with database.
7. To implement a simple notification application.
8. To implement simple intent with data passing application.
9. To implement simple profile changer application through SMS.
10. To create mobile web browser application.
11. To create mobile e-mail application to sent a mail.
12. To add Google maps to an Android application.
13. To create photo show application
14. To create app to upload a document
15. Mini project

NOTE:

1. Above applications have to be created and deployed in Android OS.
2. Environment Required: Android SDK / Android Studio.

COURSE OUTCOMES:

On completion of the lab, student will be able to

- CO1: Understand how to set up Android Development Environment.
- CO2: Design various Android UI components.
- CO3: Develop Android applications using Java.
- CO4: Develop Android applications by using Eclipse with ADT / Android Studio.
- CO5: Create real time applications using Android database connectivity.
- CO6: Deploy the Android App into play store.

**Note: Removed Contents are marked in Yellow color and
Added Contents are marked in red color**

SCS1306	DATABASE MANAGEMENT SYSTEM	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION TO DATABASES

9 Hrs.

Databases and Databases users - Database system concepts and architecture - Data modeling using Entity Relationship (ER) Model.
Relational Model - The Relational Data Model and Relational Database Constraints - The Relational Algebra and Relational Calculus.

UNIT 2 DATABASE DESIGN

9 Hrs.

Overview of the QBE Language - Overview of the Hierarchical Data Model - Overview of the Network Data Model - **SQL-99: Schema Definition, Constraints, Queries, and Views**- Functional Dependencies and Normalization for Relational Databases.

UNIT 3 QUERY PROCESSING

9Hrs.

Algorithms for Query Processing and Optimization - Introduction to Transaction Processing Concepts and Theory - Concurrency control techniques.

UNIT 4 RECOVERY AND SECURITY

9Hrs.

Database Recovery Techniques - Database Security - Distributed databases and Client- Server Architecture

UNIT 5 OBJECT DATABASE

9Hrs.

Concepts for Object Database - Enhanced Data Models for Advanced Application Emerging Database Technologies and Application
Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Construct ER model for a given application..
- CO2 : Apply normalization on Relational Databases
- CO3 : Demonstrate query optimization and concurrent transaction processing
- CO4 : Analyse recovery techniques, security mechanism, fragmentation and load balancing of databases.
- CO5 : Design database using Object Oriented techniques...
- CO6 : Create database for a specified application

TEXT / REFERENCE BOOKS

1. Elmasri & Navathe - Fundamentals of Database Systems - 3rd Edition, 2nd Reprint, Addison Wesley, 2000
2. Abraham Silberschatz, Henry. F. Korth and S. Sudharshan "Database System Concepts", 4th Edition, 2002.
3. C. J. Date, "Introduction to database systems", Addison Wesley, 7th Edition, 2001.
4. Jan L. Harrington, "Object oriented database design", Harcourt India private limited

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

PART A : 10 questions of 2 marks each- No choice

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

Exam Duration : 3 Hrs.

20 Marks

80 Marks

SCSA1301	DATABASE MANAGEMENT SYSTEMS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand terms related to database design and management.
- To gain knowledge in relational model and relational database management system.
- To implement relational databases using SQL and My SQL.
- To understand database security and performance issues.
- To understand the basics of Data warehousing and Data mining.

UNIT 1-INTRODUCTION TO DATABASES

9 Hrs.

Databases and database users – Database system concepts and architecture – Data modeling using entity Relationship(ER) model – Enhanced ER model- Relational Model - The Relational Data Model and Relational Database Constraints - The Relational Algebra and Relational Calculus.

UNIT 2-DATABASE DESIGN

9 Hrs.

Overview of the Hierarchical Data Model - Overview of the Network Data Model – Relational database design: **Mapping ER Model to Relational Model** - **Commercial query languages: QBE** – Functional dependency – Normalization.

UNIT 3-QUERY PROCESSING

9 Hrs.

SQL Queries -Embedded SQL -My SQL: Basics, Queries in MySQL and Algorithms for Query Processing and Optimization
- Introduction to Transaction Processing Concepts and Theory - Concurrency control techniques.

UNIT 4-RECOVERY AND SECURITY

9 Hrs.

Database Recovery Techniques - Database Security –Debate on the distributed databases and Client- Server Architecture with reference to Indian Railway Reservation System.

UNIT 5-OBJECT DATABASE AND CURRENT TRENDS

9 Hrs.

Concepts for Object Database - Emerging Database Technologies and Application - **Introduction to Data warehousing & Data mining –Applications of Data mining.**

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Implement SQL to a broad range of query and data update problems.

CO2 - Articulate socio-economic applications of distributed databases and use database recovery mechanisms.

CO3 - Familiar with data warehousing and data mining applications.

CO4 - Apply Normalization techniques to normalize and improve the database design.

TEXT / REFERENCE BOOKS

1. Elmasri&Navathe, "Fundamentals of Database Systems", 6th Edition, Addison Wesley, 2011.
2. Abraham Silberschatz, Henry.F.Korth and S.Sudharshan, "Database System Concepts", 4th Edition, 2002.
3. Jiawei Han and MichelineKamber, "Data Mining Concepts and Techniques", 3rd Edition, Elsevier, 2012.
4. Jan L. Harrington, "Object oriented database design", Harcourt India private limited 2000.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SIT4201	PROGRAMMING IN JAVA (50 Theory + 50 Laboratory)	L	T	P	Credits	Total Marks
		2	0	4	4	100

The course covers both theoretical and practical aspects. Marks split-up for the subject is 50% Theory and 50% Practical. Award of marks for Theory section is based on the Continuous Internal Assessments and for the Laboratory section practical examination will be conducted as per the regular University norms.

The following topics are to be covered for effective coverage of the course objective:

Class Fundamentals, Method Overriding, Inheritance, Packages, Exception Handling, Multithreading, Wrapper Classes, Input and Output Stream Classes, Byte and Character Stream Classes, Utility Packages, Applets, Swings, Database Connectivity, Regular Expressions, Networking, Java Beans

Max. 60 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 : Comprehend OOP's concepts, Java programming constructs, and Class Library with examples.

CO2 : Develop programs with Exception Handling & Multithreading Concepts.

CO3 : Implement Java Wrapper Classes and Stream Classes.

CO4 : Develop applications using Java Classes for Utility and Networking.

CO5 : Develop applications using Applet & Swings.

CO6 : Create Real time application using JDBC Connectivity.

TEXT / REFERENCE BOOKS

1. Herbert Schildt, "Java the Complete Reference", 9th Edition, McGraw Hill Education, 2014
2. <http://docs.oracle.com/javase/tutorial/>

SITA1301	PROGRAMMING IN JAVA	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To introduce object oriented concepts in Java.
- To understand Packages, Interfaces and Multithreading Concepts.
- To understand lang, io packages.
- To understand the concepts involved internet application development.
- To understand the internet application design using swing controls.

UNIT 1-INTRODUCTION TO JAVA

9 Hrs.

Classes and Objects – Class Fundamentals – Declaring Objects – Methods – Constructors – Garbage Collection. Inheritance – Basics – Using Super – Method Overriding – Abstract Classes – Using final with inheritance. String Handling – String class – String buffer class.

UNIT 2-PACKAGES, INTERFACES AND THREADS

9 Hrs.

Introduction to Packages – User Defined Packages - Importing packages – Access protection – **Interfaces** – Exception Handling - Exception Types – Using try, catch, throw, throws and finally –Multithreading – JavaThreadModel – Main thread – Creating multiple thread – Thread priorities – **Synchronization**.

UNIT 3-LANG AND IO PACKAGES

9 Hrs.

Java. lang package - Wrapper Classes– Simple type wrappers – Using **clone() and the Cloneable Interface** -IO Package - Introduction – Input Stream and Output Stream classes - Data Output Stream and Data Input Stream classes –FileInput Stream – File Output Stream. - Reader and Writer Classes – File Reader and File Writer

UNIT 4-APPLET PROGRAMMING AND EVENT HANDLING

9 Hrs.

Applet Class – Applet basics – HTML APPLET tag – Passing parameters to applets -**Delegation Event Model – Handling Mouse and Keyboard Events – Adapter Classes**.

UNIT 5-SWINGS AND DATABASE CONNECTIVITY

9 Hrs.

Introduction-J Applet Class-J Label Control - J Text Field Control –J Button Control –J Checkbox Control-J Radio Button Control – J Combo Box Control – J tapped Pane Control-J ScrollPane Control – J Table. Introduction –Establishing Connection – Creation of Data Tables – Entering Data into the Tables- Table Updating .

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Develop application programs using java object oriented concepts. CO2 - Implement the interface, package and multithread concepts.

CO3 - Implement various built in packages and its applications. CO4 -

Develop web based applications using applet programming. CO5 -

Implement Swing concepts in real time applications.

CO6 - Design the internet applications frontend and connect with backend using database connectivity.

TEXT / REFERENCE BOOKS

1. Herbert Schildt ,”The Complete Reference JAVA2”, Fifth Edition, Tata Mcgraw Hill, 2017.
2. Bruce Eckel , ”Thinking in Java”, Pearson Education, Fourth Edition 2006.
3. Core Java Volume-I Fundamentals, 9th Edition, Cay Horstman and Grazy Cornell, Prentice Hall, 2013.
4. <https://docs.oracle.com/javase/tutorial/>.
5. <https://www.tutorialspoint.com/java/>.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSA1202	PROGRAMMING WITH C AND C++	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To learn the fundamental programming concepts and methodologies which are essential to building good C/C++ program.
- To demonstrate a thorough understanding of modular programming by designing programs which require the use of programmer-defined functions.
- To impart the knowledge about pointers which is the backbone of effective memory handling.
- To demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.
- To analyze a problem and construct a C++ program that solves it.

UNIT 1-BASICS OF C PROGRAMMING

9 Hrs.

Introduction to C: Features of C - Structure of C program-Data Types-‘C’ Tokens-Input/output statements-Control Statement, Functions: – Types of Functions –Recursion.

UNIT 2-ARRAYS, STRINGS AND STRUCTURES

9 Hrs.

Arrays : Single and Multidimensional Arrays-- Array as Function Arguments, Strings: String Handling Functions, Structure: Nested Structures – Array of Structures – Structure as Function Argument–Function that Returns Structure, Union.

UNIT 3-POINTERS AND FILE PROCESSING

9 Hrs.

Pointers: Introduction, Arrays Using Pointers – Structures Using Pointers – Functions Using Pointer, Dynamic Memory Allocation, Storage Classes, File Handling in 'C'.

UNIT 4-OBJECT ORIENTED PROGRAMMING CONCEPTS

9 Hrs.

Introduction-Procedure vs. object oriented programming-Concepts: Classes and Objects-Operator and Function Overloading-Inheritance-Polymorphism and Virtual Functions.

UNIT 5-TEMPLATES AND EXCEPTION HANDLING

9 Hrs

Function Templates and Class Templates – Name spaces – Standard Template Library - Casting – Exception Handling – case study.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Develop simple applications in C using basic constructs.
- CO2 - Design and Implement applications using arrays and strings.
- CO3 - Develop and Implement applications using memory allocation and File concepts. CO4 - Use proper class protection to provide security.
- CO5 - Describe the reusability of code through Inheritance.
- CO6 - Demonstrate the use of virtual functions to implement polymorphism.

TEXT / REFERENCE BOOKS

1. Deitel and Deitel, C how to Program, 7th Edition, Pearson Education, 2013.
2. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education, 2015.
3. Yashavant Kanetkar, Understanding Pointers in C, 4th Revised and Updated Edition, Bbp Publications, 2008.
4. E Balagurusamy, Object Oriented Programming with C++, 3rd edition, Tata McGraw Hill, 2006.
5. Bhav, Object Oriented Programming with C++, Pearson Education, 2004.
6. John R Hubbard, “Programming with C++”, Schaums Outline Series, McGraw Hill, 2nd edition, 2009.
7. BjarneStroustrup, Programming: Principles and Practice using C++, 1st Edition, Addison Wesley Publications, 2008.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSA1104	PROBLEM SOLVING TECHNIQUES WITH C AND C++	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To learn the fundamentals of PST and methodologies which are essential for building good C/C++ programs.
- To demonstrate a thorough understanding of modular programming by designing programs which require the use of programmer-defined functions.
- To impart the knowledge about pointers which is the backbone of effective memory handling.
- To demonstrate adeptness of object-oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.

UNIT 1 INTRODUCTION TO COMPUTER PROBLEM SOLVING

9 Hrs.

Algorithms - Building blocks of algorithms (statements, control flow, functions) -Notation (pseudo code, flow chart) - Algorithmic problem solving for socio economic conditions in global perspectives - Simple strategies for developing algorithms (iteration, recursion) - Efficiency of algorithms.

UNIT 2 BASICS OF C PROGRAMMING

9 Hrs.

Introduction to C: Features of C - Structure of C program-Data Types-‘C’ Tokens-Input/output statements-Control Statement, Functions: – Types of Functions –Recursion.

Algorithms: Reversing the digits of a number - Generation of Fibonacci sequence- Factorial Computation.

UNIT 3 ARRAYS, STRINGS AND STRUCTURES

9 Hrs.

Arrays: Single and Multidimensional Arrays— Array as Function Arguments, Strings: String Handling Functions, Structure: Nested Structures – Array of Structures – Structure as Function Argument– Function that Returns Structure, Union.

Algorithms: Sum of array elements- Removal of duplicates from an array-Finding the Kth smallest element.

UNIT 4 POINTERS AND FILE PROCESSING

9 Hrs.

Pointers: Introduction, Arrays Using Pointers – Structures Using Pointers – Functions Using Pointer, Dynamic Memory Allocation, Storage Classes, File Handling in 'C'.

Algorithms: Swap elements using Call by Reference – Sorting Arrays using pointers- Finding sum of array elements using Dynamic Memory Allocation.

UNIT 5 OBJECT ORIENTED PROGRAMMING CONCEPTS

9 Hrs.

Introduction-Procedure vs. object-oriented programming-Concepts: Classes and Objects-Operator & Function Overloading-Inheritance-Polymorphism and Virtual Functions.

Max.45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

CO1: Develop solutions for the given problem.

CO2: Design and Implement applications using arrays and strings.

CO3: Develop and Implement applications using memory allocation and File concepts.

CO4: Use proper class protection to provide security.

CO5: Describe the reusability of code through Inheritance.

CO6: Demonstrate the use of virtual functions to implement polymorphism.

TEXT / REFERENCE BOOKS

1. Dromey.R.G, “How to Solve it by Computer”, Prentice-Hall of India, 8th Indian Reprint, 2008.
2. Aho.A.V.,Hopcroft.J.E and Ullman.J.D, “The Design and Analysis of Computer Algorithms”, Pearson education, 2004.Deitel and Deitel, C how to Program, 7th Eition, Pearson Education, 2013.
3. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education, 2015.
4. Bhawe, Object Oriented Programming with C++, Pearson Education, 2004.
5. John R Hubbard, “Programming with C++”, Schaums Outline Series, McGraw Hill, 2nd edition, 2009.
6. Bjarne Stroustrup, Programming: Principles and Practice using C++, 1st Edition, Addison Wesley Publications, 2008.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 Questions of 2 marks each-No choice

20 Marks

PART B : 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC | Approved by AICTE



Minutes of Board of Studies Meeting

Date: 08.05.2020 Time: 11.00 am Mode: Virtual

Zoom: Meeting ID: 931 3417 4161

Password: 484805

Minutes of the BOS Meeting -2020 held on 08-05-2020

Agenda:

1. Review of 2015 and 2019 curriculum.
2. Updating the course contents
3. Approval of Problem solving Techniques Lab, Code Optimization and Debugging-I, Green Computing, Cyber Forensics and Virtualization Techniques courses.

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

- The contents of the courses "*Database Management System*" and "*Programming in Java*" have been changed based on the feedback received from students and faculty members.
- Based on the feedback received from faculty members, the course on "*Programming in C and C++*" has been moved from Semester 2 to Semester 1. In conjunction, the course on "*Python Programming*" is moved from Semester 1 to Semester 2.
- In order to improvise the content of the course, "*Programming in C and C++*", the problem-solving concepts were introduced.
- The contents of the course "*Python Programming*" was also revised based on the feedback received from faculty and students.
- In continuance with "*Programming in C and C++*", course, to practice the concepts learned, "*Problem solving Techniques Lab*" course, is introduced in Semester 1, and based on the comments received from the industrial experts and board members.

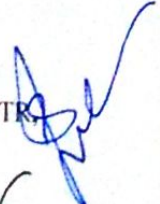
- Based on the recent technological advancements, it is essential to incorporate the innovative courses into the curriculum. With regard to this, suggestions were received from the industrial experts. Based on the suggestions received, the new courses namely "*Green Computing*", "*Cyber Forensics*" and "*Virtualization Techniques*" courses were introduced. The course contents of all the new courses were reviewed by the board members and approved.
- Further, to improvise the coding skill of the students, and to equip the students with skill-based learning, suggestions were given by the board members and industrial experts to include a lab course. In this regard, the "*Code Optimization and Debugging-I*" course has been included in Semester 3.
- The external members suggested to keep the basic concepts in the curriculum undisturbed. In addition, suggestions were given to incorporate functional programming, by bringing industrial experts to add additional insights to the students.

Convener: Dr.T.Sasikala, Dean, School of Computing

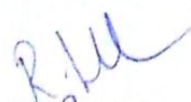
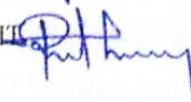


External Members:

Academic Expert

- Mr. Somasundaram, Vice President, Maveric Systems, Chennai. 
- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR Chennai. 
- Mr.SingaraveluEkambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai. 

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT 
- Dr.P.Jeyanthi, Associate Professor, IT 
- Dr.Maria Anu ,Associate Professor, IT 
- Dr.S.Revathy, Associate Professor, IT 



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC | Approved by AICTE



Minutes of Board of Studies Meeting

Date: 14.12.2020

Time: 11.00 am

Mode: Virtual

Minutes of the BOS Meeting -2020 held on 14-12-2020.

Agenda:

1. Review of 2015 and 2019 curriculum.
2. Updating the course contents of Existing Courses and Introduction of new courses

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

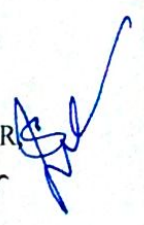
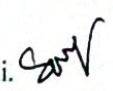
- Contents of the following courses have been changed based on the feedback given by students and faculty members and students.
 1. *Data Structures*
 2. *Data Structures lab*
 3. *Data Communication and Computer Networks*
 4. *Design and Analysis of algorithms*
 5. *Networking Lab*
- The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.
 1. *SCSA1204-Python programming*
 2. *SAIC4003-Society 5.0*
 3. *SCSA2402-Code Optimization and Debugging-II*
- In 2019 curriculum, Industry 4.0 is replaced with Society 5.0

Convener: Dr.T.Sasikala, Dean School of Computing

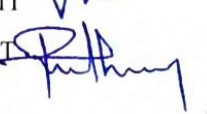


External Members:

Academic Expert

- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR Chennai. 
- Mr.SingaraveluEkambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai. 
- Mr. Somasundaram, Vice President, Maveric Systems, Chennai. 

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT 
- Dr.P.Jeyanthi, Associate Professor, IT 
- Dr.Maria Anu ,Associate Professor, IT 
- Dr.S.Revathy, Associate Professor, IT 

SCS1103	DATA STRUCTURES	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION

9 Hrs.

Introduction to algorithms - Recursion - Definition - Design Methodology and Implementation of recursive algorithms - Linear and binary recursion - recursive algorithms for factorial function - Fibonacci sequence - Tower of Hanoi - Tail recursion – Data Structures - Need - classification - operations - Array - characteristics - types - storage representations.

UNIT 2 SEARCHING AND SORTING TECHNIQUES

9 Hrs.

Basic concepts - List Searches using Linear Search - Binary Search - Fibonacci Search - Sorting Techniques - Insertion sort - Heap sort - Bubble sort - Quick sort - Merge sort - Analysis of sorting techniques.

UNIT 3 STACKS

9 Hrs.

Basic Stack Operations - Representation of a Stack using Arrays - Algorithm for Stack Operations - Stack Applications: Reversing list - Factorial Calculation - Infix to postfix Transformation - Evaluating Arithmetic Expressions.

UNIT 4 QUEUES

9 Hrs.

Basic Queue Operations - Representation of a Queue using array - Implementation of Queue Operations using Stack - Applications of Queues - Round robin Algorithm - Enqueue - Dequeue - Circular Queues - Priority Queues.

UNIT 5 LINKED LISTS

9 Hrs.

Introduction - Single linked list - Representation of a linked list in memory - Operations on a singly linked list - Merging two singly linked lists into one list - Reversing a singly linked list - Applications of singly linked list to represent polynomial expressions and sparse matrix manipulation - Advantages and disadvantages of singly linked list - Circular linked list - Doubly linked list - Circular Doubly Linked List.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 : Solve problems using recursive algorithms.

CO2 : Develop different searching and sorting algorithms.

CO3 : Implement stack operations.

CO4 : Solve problems using queues.

CO5 : Create different types of Linked List and perform various operations.

CO6 : Decide the appropriate data structure for a specified problem.

TEXT / REFERENCE BOOKS

1. Jean-Paul Tremblay, Paul G. Sorenson, 'An Introduction to Data Structures with Application', TMH, 2nd Edition.
2. Naps, Thomas L., and Bhagat Singh, "Introduction to Data Structure with Pascal", West Publishing Co., 1986.
3. Richard F. Gilberg, Forouzan, "Data Structures", Cengage, 2nd Edition.

END SEMESTER EXAM QUESTION PAPER PATTERN:

Max. Marks: 100

Exam Duration: 3 hrs

PART A: 2 Questions from each unit, each carrying 2 marks

20 Marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCSA1203	DATA STRUCTURES	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To impart the basic concepts of data structures and algorithms.
- To be familiar with writing recursive methods.
- To understand concepts about searching and sorting techniques.
- To implement basic concepts about stacks.
- To apply the concepts of queues and its types.

UNIT 1 INTRODUCTION TO ALGORITHMS

9 Hrs.

Introduction Data Structures - Need - classification - operations –Abstract data types (ADT)- Array - characteristics - types - storage representations. **Array Order Reversal-Array Counting or Histogram-Finding the maximum Number in a Set**, Recursion- Towers of Hanoi-Fibonacci series-Factorial.

UNIT 2 LINKED LISTS

9 Hrs.

Introduction - Singly linked list - Representation of a linked list in memory - Operations on a singly linked list - Merging two singly linked lists into one list - Reversing a singly linked list - Applications of singly linked list to represent polynomial - Advantages and disadvantages of singly linked list - Circular linked list - Doubly linked list - Circular Doubly Linked List

UNIT 3 STACKS

9 Hrs.

Basic Stack Operations - Representation of a Stack using Arrays - Algorithm for Stack Operations - Stack Applications: Reversing list - Factorial Calculation - Infix to postfix Transformation - Evaluating Arithmetic Expressions.

UNIT 4 QUEUES

9 Hrs.

Basic Queue Operations - Representation of a Queue using array - Applications of Queues - Round robin Algorithm - Enqueue - Dequeue - Circular Queues - Priority Queues.

UNIT 5 SEARCHING AND SORTING TECHNIQUES

9 Hrs.

Basic concepts - List Searches using Linear Search - Binary Search - Fibonacci Search - Sorting Techniques - Insertion sort - Heap sort - Bubble sort - Quick sort - Merge sort - Analysis of sorting techniques.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Understand the concept of recursive algorithms.
- CO2 - Demonstrate the different types of data structures.
- CO3 - Able to understand the operations on linear data structures.
- CO4 - Summarize searching and sorting techniques.
- CO5 - Choose appropriate data structure as applied to specified problem definition.
- CO6 - Understand and implement the applications of linear data structures.

TEXT / REFERENCE BOOKS

1. Jean-Paul Tremblay, Paul G. Sorenson, 'An Introduction to Data Structures with Application', TMH, 2017.
2. Richard F. Gilberg, Forouzan, "Data Structures", Cengage, 2004, 2nd Edition.
3. Larry R. Nyhoff, ADTs, Data Structures, and Problem Solving with C++, Prentice Hall Edition, 2004.
4. Thomas H. Cormen, Charles E. Leiserson, "Introduction to Algorithms", 3rd Edition, 2010.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions carrying 2 marks each – No choice

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

Exam Duration: 3 Hrs.

20 Marks

80 Marks

SCS4102	DATA STRUCTURES LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

1. Program to insert and delete an element from an array.
2. Program to sort the elements using insertion sort.
3. Program to sort the elements using quick sort.
4. Program to sort the elements using merge sort.
5. Program to implement operations on a Singly linked list.
6. Program to implement operations on a doubly linked list.
7. Program to implement a Stack using an array.
8. Program to implement a Stack using a Linked list.
9. Program to implement Queue using an array.
10. Program to implement Queue using a Linked list.
11. Program to convert an infix expression to postfix expression.
12. Program to implement display elements of a queue according to their priority.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 : Solve various problems using Array Concept.

CO2 : Identify appropriate sorting algorithm for the given context.

CO3 : Solve Problems using Stack Data Structures.

CO4 : Solve real world problems, using Queue Data Structures.

CO5 : Develop applications using Linked lists.

CO6 : Apply the appropriate Data Structure for the given application.

SCSA2201	DATA STRUCTURES LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To implement linear and non-linear data structures.
- To understand the different operations of search trees.
- To implement graph traversal algorithms.
- To get familiarized to sorting algorithms.
- To implement linear search and binary Search.

SUGGESTED LIST OF EXPERIMENTS

- Program to insert and delete an element in an array.
- Program to implement operations on a Singly linked list.
- Program to implement operations on a doubly linked list.
- Program to sort the elements using insertion sort.
- Program to sort the elements using quick sort.
- Program to sort the elements using merge sort.
- Program to implement a Stack using an array and Linked list.
- Program to implement Queue using an array and Linked list.
- Program to implement Circular Queue.
- Program to convert an infix expression to postfix expression.
- Program to implement display elements of a queue according to their priority.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Remembering the concept of data structures through ADT including List, Stack and Queues.

CO2 - Understand basic concepts about stacks, queues, lists, trees and graphs.

CO3 - Able to apply and implement various tree traversal algorithms and ensure their correctness.

CO4 - Ability to analyze algorithms and develop algorithms through step by step approach in solving problems with the help of fundamental data structures.

CO5 - Compare and contrast Array based and Link based applications of typical data structures such As Stacks and Queues.

CO6 - Design applications and justify use of specific linear data structures for various applications.

SCS1314	DATA COMMUNICATION AND COMPUTER NETWORKS	L	T	P	Credits	Total Marks
		3	0	0		

UNIT 1 DATA COMMUNICATION

9 Hrs.

Introduction to data communication - Network protocols & standards - Line configuration - Topology - Transmission mode - Categories of networks - OSI model - Layers of OSI model - TCP/IP Model - Transmission media- Guided media - Unguided media.

UNIT 2 DATALINK LAYER

9 Hrs.

Link layer services - Framing - Flow Control - Error control- Medium Access Control - Ethernet CSMA/CD - Token Ring - FDDI - Token Passing- Wireless LAN - CSMA/CA

UNIT 3 NETWORK LAYER

9 Hrs

Circuit Switching - Packet Switching - Routing - Distance Vector Routing - Link State Routing - Addressing- Subnetting - IPV4- IPV6- ARP - RARP - ICMP - IGMP - DHCP.

UNIT 4 TRANSPORT LAYER

9 Hrs.

TCP- UDP - Connection Management- Flow Control - Retransmission - Congestion Control - Detection and Avoidance.

UNIT 5 APPLICATION LAYER

9 Hrs.

Networking Devices - Repeaters - Switches - Bridges - Routers - Gateways- Domain Name System - FTP - WWW and HTTP - SNMP - SMTP - POP3 - IMAP - MIME.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to:

- CO1: Understand and explain the concept of Data Communication and networks, layered architecture and their applications.
- CO2: Evaluate data communication link considering elementary concepts of data link layer protocols for error detection and correction.
- CO3: Apply various network layer techniques for designing subnets and supernets and analyse packet flow on basis of routing protocols.
- CO4: Analyze and Set up protocol designing issues for Communication networks.
- CO5: Estimate the congestion control mechanism to improve quality of service of networking application
- CO6: Understand and design application layer protocols and internet applications such as network security, Email and DNS,

TEXT / REFERENCE BOOKS

- Behrouz A. Fourouzan, "Data Communication and Networking", McGraw-Hill Education India Pvt. Ltd - New Delhi.
- William Stallings, Data and Computer Communications (8th ed.), Pearson Education, 2007.
- P.C. Gupta, Data Communications and Computer Networks, Prentice-Hall of India, 2006.
- Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, Pearson.
- L. L. Peterson and B. S. Davie, Computer Networks: A Systems Approach (3rd ed.), Morgan Kaufmann, 2003.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SITA1401	DATA COMMUNICATION AND COMPUTER NETWORKS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the network architecture and protocols supported for connecting devices in a network.
- To gain the knowledge of framing in data link layer.
- To learn the functions of network layer and the routing strategies with their associated protocols.
- To introduce the protocols used for end to end packet delivery in transport layer.
- To understand the application layer protocols.

UNIT 1 DATA COMMUNICATION

9 Hrs.

Introduction to data communication - Network protocols & standards - Line configuration - Topology - Transmission mode - Categories of networks - OSI model - Layers of OSI model - TCP/IP Model – Transmission media - Guided media - Unguided media- **Switching-Circuit Switching - Packet Switching.**

UNIT 2 DATALINK LAYER

9 Hrs.

Error detection and correction– Line Discipline - Flow Control - Error control- Medium Access Control – Ethernet - CSMA/CD - Wireless LAN - CSMA/CA – **IEEE 802.11, Bluetooth.**

UNIT 3 NETWORK LAYER

9 Hrs.

Routing - Distance Vector Routing - Link State Routing - Addressing-Subnetting - IPV4- IPV6- ARP - RARP - ICMP - IGMP - DHCP.- **Networking Devices - Repeaters - Switches - Bridges - Routers – Gateways.**

UNIT 4 TRANSPORT LAYER

9 Hrs.

TCP- UDP - Connection Management - Flow Control - Retransmission - Congestion Control – **Leaky bucket algorithm** - Detection and Avoidance.

UNIT 5 APPLICATION LAYER

9 Hrs.

Message Handling System(MHS) – FTAM – Virtual Terminal (VT) – Domain Name System - FTP - WWW and HTTP - SNMP - SMTP – POP3 - IMAP – MIME -TELNET

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Describe the architecture of a computer network and explain how each device in a network communicates with each other.
- CO2 - Explain packet collision in the link layer and how they are corrected.
- CO3 - Design a routing protocol in a network and demonstrate how data packet will reach to the intended destination.
- CO4 - Implementation of flow control mechanism to regulate the traffic in a network.
- CO5 - Describe IP addressing and explain its functions.
- CO6 - Recognize various application layer protocols and its functions.

TEXT / REFERENCE BOOKS

1. Behrouz A. Fourouzan, "Data Communication and Networking", Fifth Edition, McGraw-Hill Education India Pvt. Ltd - New Delhi., 2013.
2. William Stallings, Data and Computer Communications (8th ed.), Pearson Education, 2007.
3. P.C. Gupta, Data Communications and Computer Networks, Prentice-Hall of India, 2006.
4. Andrew S. Tanenbaum, "Computer Networks", Fifth Edition, Pearson, 2011.
5. L. L. Peterson and B. S. Davie, Computer Networks: A Systems Approach (3rd ed.), Morgan Kaufmann, 2003.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCS1206	DESIGN AND ANALYSIS OF ALGORITHM	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION

9 Hrs.

Fundamentals of Algorithmic Problem Solving - Time Complexity - Space complexity with examples - Growth of Functions - Asymptotic Notations: Big Oh, Little Oh, Omega, Theta - Properties - Complexity Analysis Examples - Performance measurement - Instance Size, Test Data, Experiment setup.

UNIT 2 MATHEMATICAL FOUNDATIONS

9 Hrs.

Solving Recurrence Equations - Substitution Method - Recursion Tree Method - Master Method - Best Case - Worst Case - Average Case Analysis - Sorting in Linear Time - Lower bounds for Sorting - Counting Sort - Radix Sort - Bucket Sort

UNIT 3 DESIGN OF ALGORITHMS - BRUTE FORCE AND DIVIDE-AND-CONQUER

9 Hrs.

Brute Force - Travelling Salesman Problem - Knapsack Problem - Assignment Problem - Closest Pair and Convex Hull Problems - Divide and Conquer Approach - Binary Search - Quick Sort - Merge Sort - Strassen's Matrix Multiplication.

UNIT 4 DESIGN OF ALGORITHMS - DYNAMIC PROGRAMMING AND GREEDY APPROACH

9 Hrs.

Dynamic Programming - Floyd Warshall Algorithm - Optimal Binary Search Algorithms - Greedy Approach - Huffman Code - Kruskal's Algorithm - Prim's Algorithm - Dijkstra's Algorithm

UNIT 5 DESIGN OF ALGORITHMS - BACKTRACKING AND BRANCH AND BOUND

9 Hrs.

Backtracking - 8 Queens - Hamiltonian Circuit Problem - Branch and Bound - Assignment Problem - Knapsack Problem - Travelling Salesman Problem - NP Complete Problems - Clique Problem - Vertex Cover Problem

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 : Analyze the efficiency of an algorithm based on time and space complexity.

CO2 : Apply mathematical principles for recursive analysis.

CO3 : Construct algorithms based on brute force and divide and conquer techniques and its real time applications.

CO4 : Design Solutions using dynamic and greedy approaches for real world problems.

CO5 : Design a solution by using Branch and Bound and backtracking techniques.

CO6 : Develop a solution for any given problem by choosing appropriate algorithm.

TEXT / REFERENCE BOOKS

1. Sartaj Sahni, "Data Structures, Algorithms, and Applications in C++", McGraw Hill, 2nd Edition, 2005.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.
3. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
4. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, Reprint 2006.
5. Donald E. Knuth, "The Art of Computer Programming", Volumes 1 & 3 Pearson Education, 2009.
6. Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 2 Questions from each unit, each carrying 2 marks

20 Marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCSA1403	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To analyze the performance of algorithms under various scenarios.
- To learn mathematical background for algorithm analysis & solving the recurrence equations.
- To learn various algorithm design techniques.
- To understand and apply the algorithms.

UNIT 1-INTRODUCTION

9 Hrs.

Fundamentals of Algorithmic Problem Solving - Time Complexity - Space complexity with examples - Growth of Functions - Asymptotic Notations: Need, Types - Big Oh, Little Oh, Omega, Theta - Properties - Complexity Analysis Examples - Performance measurement - Instance Size, Test Data, Experimental setup.

UNIT 2-MATHEMATICAL FOUNDATIONS

9 Hrs.

Solving Recurrence Equations - Substitution Method - Recursion Tree Method - Master Method - Best Case - Worst Case - Average Case Analysis - Sorting in Linear Time - Lower bounds for Sorting: - Counting Sort - Radix Sort - Bucket Sort.

UNIT 3-BRUTE FORCE AND DIVIDE-AND-CONQUER

9 Hrs.

Brute Force:- Travelling Salesman Problem - Knapsack Problem - Assignment Problem - Closest Pair and Convex Hull Problems - Divide and Conquer Approach:- Binary Search - Quick Sort - Merge Sort - Strassen's Matrix Multiplication.

UNIT 4-GREEDY APPROACH AND DYNAMIC PROGRAMMING

9 Hrs.

Greedy Approach:- Optimal Merge Patterns- Huffman Code - **Job Sequencing problem- -- Tree Vertex Splitting Dynamic Programming:- Dice Throw--** Optimal Binary Search Algorithms.

UNIT 5-BACKTRACKING AND BRANCH AND BOUND

9 Hrs.

Backtracking:- 8 Queens - Hamiltonian Circuit Problem - Branch and Bound - Assignment Problem - Knapsack Problem:- Travelling Salesman Problem - NP Complete Problems - Clique Problem - Vertex Cover Problem .

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Determine the suitable algorithmic design technique for a given problem. CO2 -

Identify the limitations of algorithms in problem solving.

CO3 - Analyze the efficiency of the algorithm based on time and space complexity.

CO4 - Implement asymptotic notations to analyze worst-case and average case running times of algorithms.

CO5 - Interpret the fundamental needs of algorithms in problem solving.

CO6 - Describe the various algorithmic techniques and its real time applications.

TEXT / REFERENCE BOOKS

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms David E. Goldberg, "Genetic Algorithm In Search Optimization And Machine Learning" Pearson Education India, 2013.
3. AnanyLevitin, "Introduction to the Design and Analysis of Algorithms", 3rd Edition, Pearson Education, 2012.
4. Ellis Horowitz, SartajSahni and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Second Edition, Universities Press, 2007.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks:100

Exam Duration: 3 Hrs.

PART A: 10 Question of 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCS4304	NETWORKING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

1. Creation of Date Server, and also print the client's address on the Server.
2. Creation of UDP Server
3. Creation of Chat Program
4. Calculation of Checksum for packet data and file.
5. Program to implement HTTP Protocol
6. Creation of Mail Client
7. Creation of Web Server
8. Creation of TELNET Protocol
9. Implement FTP using TCP
10. WiFi Simulation
11. WiTotal Simulation
12. Router Configuration

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 : Comprehend the different aspects of client-server networks and User Datagram Protocol (UDP) server models.

CO2 : Make use of HTTP protocol over the internet and examine the formation, transmission in the web servers..

CO3 : Develop a web server with the open source software

CO4 : Implement File Transfer Protocol to communicate with remote server.

CO5 : Design access points for a location using wi-fi Simulation.

CO6 : Create and configure Router to communicate one network to another network.

SITA2401	NETWORKING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To understand how to implement socket programming.
- To be familiar with simulation tools.
- To understand how to create applications using TCP and UDP.
- To gain Knowledge on various networking protocols.

SUGGESTED LIST OF EXPERIMENTS

1. Study of Socket Programming and Client – Server model.
2. Creation of Date Server, and also print the client's address on the Server.
3. Applications using TCP Sockets like.
 - a. Echo client and echo server
 - b. Chat
 - c. File Transfer
4. Applications using TCP and UDP Sockets like.
 - a. DNS
 - b. SNMP
 - c. File Transfer
5. Calculation of Checksum for packet data and file.
6. Program to implement HTTP Protocol.
7. Implementation of Stop and Wait Protocol and Sliding Window Protocol.
8. Simulating PING and TRACEROUTE commands.
9. Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.
10. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
 - i. Link State routing
 - ii. Flooding
 - iii. Distance vector
11. WiFi Simulation.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Analyze the performance of the protocols in different layers. CO2 - Implement various protocols.

CO3 - Design with simulation tools.

CO4 - Analyze various routing algorithms. CO5 - Construct Wi-Fi model.

CO6 - Understand socket programming.



SATHYABAMA

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Minutes of Board of Studies Meeting

Date: 08.05.2020 Time: 11.00 am Mode: Virtual

Zoom: Meeting ID: 931 3417 4161

Password: 484805

Minutes of the BOS Meeting -2020 held on 08-05-2020

Agenda:

1. Review of 2015 and 2019 curriculum.
2. Updating the course contents
3. Approval of Problem solving Techniques Lab, Code Optimization and Debugging-I, Green Computing, Cyber Forensics and Virtualization Techniques courses.

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

- The contents of the courses "*Database Management System*" and "*Programming in Java*" have been changed based on the feedback received from students and faculty members.
- Based on the feedback received from faculty members, the course on "*Programming in C and C++*" has been moved from Semester 2 to Semester 1. In conjunction, the course on "*Python Programming*" is moved from Semester 1 to Semester 2.
- In order to improvise the content of the course, "*Programming in C and C++*", the problem-solving concepts were introduced.
- The contents of the course "*Python Programming*" was also revised based on the feedback received from faculty and students.
- In continuance with "*Programming in C and C++*", course, to practice the concepts learned, "*Problem solving Techniques Lab*" course, is introduced in Semester 1, and based on the comments received from the industrial experts and board members.

- Based on the recent technological advancements, it is essential to incorporate the innovative courses into the curriculum. With regard to this, suggestions were received from the industrial experts. Based on the suggestions received, the new courses namely "*Green Computing*", "*Cyber Forensics*" and "*Virtualization Techniques*" courses were introduced. The course contents of all the new courses were reviewed by the board members and approved.
- Further, to improvise the coding skill of the students, and to equip the students with skill-based learning, suggestions were given by the board members and industrial experts to include a lab course. In this regard, the "*Code Optimization and Debugging-I*" course has been included in Semester 3.
- The external members suggested to keep the basic concepts in the curriculum undisturbed. In addition, suggestions were given to incorporate functional programming, by bringing industrial experts to add additional insights to the students.

Convener: Dr.T.Sasikala, Dean, School of Computing



External Members:

Academic Expert

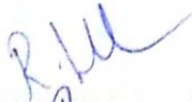
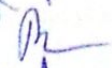
- Mr. Somasundaram, Vice President, Maveric Systems, Chennai.
- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR Chennai.
- Mr.SingaraveluEkambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai.

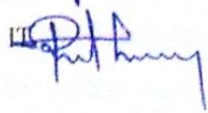




Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu ,Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT



**Note: Removed Contents are marked in Yellow color and
Added Contents are marked in red color**

SCS1101	PROBLEM SOLVING TECHNIQUES	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- ☐ To understand the basics of solving a problem through computing
- ☐ To study different algorithms for solving a given problem.

UNIT 1 PROGRAMMING TECHNIQUES

9Hrs.

Steps Involved in Computer Programming - Problem Definition - Outlining The Solution - Flow Chart - Developing Algorithms - Efficiency of Algorithms - Analysis of Algorithms - Step Count & Operation Count

UNIT 2 FUNDAMENTAL ALGORITHMS

9 Hrs.

Exchanging the Values - Counting - Summation of Set of Number - Factorial Computation - Sine Computation - Fibonacci Sequence - Reversing the Digits of an Integer - Base Conversion - Character to Number Conversion.

UNIT 3 FACTORING METHODS

9 Hrs.

Finding the Square Root of a Number - Smallest Divisor of an Integer - GCD of Two Integers - Generating Prime Numbers - Computing the Prime Factors of an Integer - Generation of Pseudo - Random Numbers - Raising a Number to a Large Power - Computing the Nth Fibonacci Number.

UNIT 4 ARRAY TECHNIQUES

9 Hrs.

Array Order Reversal - Array Counting or Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array - Finding the kth Smallest Element - Longest Monotone Subsequence.

UNIT 5 DESIGN OF ALGORITHMS- BACKTRACKING, BRANCH AND BOUND, SEARCHING 9Hrs

Backtracking - 8 Queens - Hamiltonian Circuit Problem, Branch and Bound - Travelling Salesman Problem, Searching - water jug problem, tic-tac-toe problem.

Max. 45 Hours

TEXT / REFFERENCE BOOKS

1. Dromey.R.G, "How to Solve it by Computer", Prentice-Hall of India, Eighth Indian Reprint,1996.
2. Ellis Horowitz,sartaj Sahni ,"Fundamentals of Data Structures", Computer Science Press,1983.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100 Exam

Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSA1101	PYTHON AND PROBLEM SOLVING TECHNIQUES	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To learn fundamentals of PST and basics of python programming.
- To learn modular programming.
- To study in detailed data representation, operator, control structures, functions in python and apply it on problems.
- To learn in built functions in python and apply it on mathematical problem.
- To learn advanced algorithm by implementing lists, tuples and dictionaries.

UNIT 1 INTRODUCTION TO COMPUTER PROBLEM SOLVING

9 Hrs.

Algorithms, building blocks of algorithms (statements, control flow, functions), notation (pseudo code, flow chart), algorithmic problem solving for socio economic conditions in global perspectives, simple strategies for developing algorithms (iteration, recursion), the efficiency of algorithms.

UNIT 2 DATA, EXPRESSIONS, STATEMENTS

9 Hrs.

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments;

Algorithms: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT 3 CONTROL FLOW, FUNCTIONS

9 Hrs.

Conditional statements: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iterative statements: while, for, break, continue, pass, Applying for critical conditions. Algorithms: square root, exponentiation, sum an array of numbers, factorial computation-Sine function computation-Generation of the Fibonacci sequence-Reversing the digits of an integer.

UNIT 4 FACTORING METHOD

9 Hrs.

Functions: return values, parameters, local and global scope. Lambda, filter, map and reduce functions. Algorithms: The smallest divisor of an integer-The greatest common divisor of two integers-Generating Prime Numbers-Computing the Prime Factors of an integer- Raising a Number to a Large Power

UNIT 5 LISTS, TUPLES, DICTIONARIES

9 Hrs.

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension; Algorithms: Removal of Duplicates - Partitioning - Finding the kth smallest Element- histogram.

Max.45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Design a modular solution for a given problem.

CO2 - Choose appropriate algorithm for each module considering economic and social aspects.

CO3 - Employ multiple critical and creative thinking strategies in reasoning and problem solving.

CO4 - Evaluate and choose an appropriate problem-solving strategy.

CO5 - Document the approach to be implemented in any language.

CO6 - Apply to the problem-solving techniques on real world problems.

TEXT / REFERENCE BOOKS

1. Dromey R.G., “How to Solve it by Computer”, Prentice Hall of India, 8th Indian Reprint, 2008.
2. Aho A.V., Hopcroft J.E. and Ullman J.D., “The Design and Analysis of Computer Algorithms”, Pearson Education, 2004.
3. Martin C. Brown, “Python: The Complete Reference”, McGraw Hill, 2018.
4. John M. Zelle, “Python Programming: An Introduction to Computer Science”, Library of Congress.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each – No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

Minutes of Board of Studies Meeting

Date: 14.12.2020

Time: 11.00 am

Mode: Virtual

Minutes of the BOS Meeting -2020 held on 14-12-2020.

Agenda:

- 1) Review of 2015 and 2019 curriculum.
- 2) Updating the course contents of Existing Courses and Introduction of new courses

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

- ❖ The courses "*Data Structures*" and "*Data Structures Lab*" have been revised after reviewing 2015 curriculum.
- ❖ The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.
 1. *SCSA3019 – Augmented and Virtual Reality*
 2. *SITA3011 – Block chain Technologies*
 3. *SCSA1706 – Cyber Digital Twin*

Convener: Dr.T.Sasikala, Dean School of Computing



External Members:

Academic Expert

- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR, Chennai.
- Mr.Singaravelu Ekambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai.
- Mr. S.Chockalingam, Cisco Systems, Chennai

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu, Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT

**Note: Removed Contents are marked in Yellow color and
Added Contents are marked in red color**

SCS1103	DATA STRUCTURES	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the searching and sorting techniques.
- To familiarize with stacks, queues and linked lists.

UNIT 1 INTRODUCTION 9 Hrs.

Introduction to algorithms - Recursion - Definition - Design Methodology and Implementation of recursive algorithms - Linear and binary recursion - recursive algorithms for factorial function - Fibonacci sequence - Tower of Hanoi - Tail recursion – Data Structures - Need - classification - operations - Array - characteristics - types - storage representations.

UNIT 2 SEARCHING AND SORTING TECHNIQUES 9 Hrs.

Basic concepts - List Searches using Linear Search - Binary Search - Fibonacci Search - Sorting Techniques - Insertion sort - Heap sort - Bubble sort - Quick sort - Merge sort - Analysis of sorting techniques.

UNIT 3 STACKS 9 Hrs

Basic Stack Operations - Representation of a Stack using Arrays - Algorithm for Stack Operations - Stack Applications: Reversing list - Factorial Calculation - Infix to postfix Transformation - Evaluating Arithmetic Expressions.

UNIT 4 QUEUES 9 Hrs

Basic Queue Operations - Representation of a Queue using array - Implementation of Queue Operations using Stack - Applications of Queues - Round robin Algorithm - Enqueue - Dequeue - Circular Queues - Priority Queues.

UNIT 5 LINKED LISTS 9 Hrs

Introduction - Single linked list - Representation of a linked list in memory - Operations on a singly linked list - Merging two singly linked lists into one list - Reversing a singly linked list - Applications of singly linked list to represent polynomial expressions and sparse matrix manipulation - Advantages and disadvantages of singly linked list - Circular linked list - Doubly linked list - Circular Doubly Linked List.

Max. 45 Hours

TEXT / REFERENCE BOOKS

1. Jean-Paul Tremblay, Paul G. Sorenson, 'An Introduction to Data Structures with Application', TMH, 2nd Edition.
2. Naps, Thomas L., and Bhagat Singh, "Introduction to Data Structure with Pascal", West Publishing Co., 1986.
3. Richard F, Gilberg, Forouzan, "Data Structures", Cengage, 2nd Edition.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks -

80 Marks

SCSA1203	DATA STRUCTURES	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To impart the basic concepts of data structures and algorithms
- To be familiar with writing recursive methods.
- To understand concepts about searching and sorting techniques.
- To implement basic concepts about stacks.
- To apply the concepts of queues and its types..

UNIT-1 INTRODUCTION TO ALGORITHMS

9 Hrs

Introduction Data Structures - Need - classification - operations –Abstract data types (ADT)- **Array - characteristics - types storage representations. Array Order Reversal-Array Counting or Histogram-Finding the maximum Number in a Set, Recursion- Towers of Hanoi-Fibonacci series-Factorial.**

UNIT-2 LINKED LISTS

9 Hrs

Introduction - Singly linked list - Representation of a linked list in memory - Operations on a singly linked list - Merging two singly linked lists into one list - Reversing a singly linked list - Applications of singly linked list to represent polynomial - Advantages and disadvantages of singly linked list - Circular linked list - Doubly linked list - Circular Doubly Linked List

UNIT-3 STACKS

9 Hrs

Basic Stack Operations - Representation of a Stack using Arrays - Algorithm for Stack Operations - Stack Applications: Reversing list - Factorial Calculation - Infix to postfix Transformation - Evaluating Arithmetic Expressions.

UNIT-4 QUEUES

9 Hrs

Basic Queue Operations - Representation of a Queue using array - Applications of Queues - Round robin Algorithm - Enqueue - Dequeue - Circular Queues - Priority Queues.

UNIT-5 SEARCHING AND SORTING TECHNIQUES

9 Hrs.

Basic concepts - List Searches using Linear Search - Binary Search - Fibonacci Search - Sorting Techniques - Insertion sort - Heap sort - Bubble sort - Quick sort - Merge sort - Analysis of sorting techniques.

Max.45Hours

COURSE OUTCOMES:

On completion of the course, student will be able to:

- CO1: Understand the concept of recursive algorithms.
- CO2: Demonstrate the different types of data structures.
- CO3: Able to understand the operations on linear data structures.
- CO4: Summarize searching and sorting techniques.
- CO5: Choose appropriate data structure as applied to specified problem definition.
- CO6: Understand and implement the applications of linear data structures

TEXT / REFERENCE BOOKS:

1. Jean-Paul Tremblay, Paul G. Sorenson, 'An Introduction to Data Structures with Application', TMH, 2017.
2. Richard F. Gilberg, Forouzan, "Data Structures", Cengage, 2004, 2nd Edition.
3. Larry R. Nyhoff, ADTs, Data Structures, and Problem Solving with C++, Prentice Hall Editin, 2004.
4. Thomas H. Cormen, Charles E. Leiserson, "Introduction to Algorithms", 3rd Edition, 2010.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SCS4102	DATA STRUCTURES LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

1. Program to insert and delete an element from an array.
2. Program to sort the elements using insertion sort.
3. Program to sort the elements using quick sort.
4. Program to sort the elements using merge sort.
5. Program to implement operations on a Singly linked list.
6. Program to implement operations on a doubly linked list.
7. Program to implement a Stack using an array.
8. Program to implement a Stack using a Linked list.
9. Program to implement Queue using an array.
10. Program to implement Queue using a Linked list.
11. Program to convert an infix expression to postfix expression.
12. Program to implement display elements of a queue according to their priority.

SCSA2201	DATA STRUCTURES LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES:

- To implement linear and non-linear data structures.
- To understand the different operations of search trees.
- To implement graph traversal algorithms.
- To get familiarized to sorting algorithms.
- To implement linear search and binary Search.

LIST OF EXPERIMENTS:

1. Program to insert and delete an element in an array.
2. Program to implement operations on a Singly linked list.
3. Program to implement operations on a doubly linked list.
4. Program to sort the elements using insertion sort.
5. Program to sort the elements using quick sort.
6. Program to sort the elements using merge sort.
7. Program to implement a Stack using an array and Linked list.
8. Program to implement Queue using an array and Linked list.
9. Program to implement Circular Queue.
10. Program to convert an infix expression to postfix expression.
11. Program to implement display elements of a queue according to their priority

COURSE OUTCOMES:

On completion of the course, student will be able to-

- CO1: Remembering the concept of data structures through ADT including List, Stack and Queues
CO2: Understand basic concepts about stacks, queues, lists, trees and graphs
CO3: Able to apply and implement various tree traversal algorithms and ensure their correctness
CO4: Ability to analyze algorithms and develop algorithms through step by step approach in solving problems with the help of fundamental data structures.
CO5: Compare and contrast Array based and Link based applications of typical data structures such As Stacks and Queues.
CO6: Design applications and justify use of specific linear data structures for various applications



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Minutes of Board of Studies Meeting

Date: 24.05.2018 Time: 10.00 am Venue: IT Lab

Minutes of the BOS Meeting -2018 held on 24-05-2018

Agenda:

- 1) Review of 2015 and 2010 curriculum.
- 2) Updation of course contents
- 3) Inclusion of new courses

The Minutes of Meeting

The meeting was commenced by the welcome note of Dr.M.Lakshmi, Convener, Board of Studies. The board of members reviewed the 2015 and 2010 curriculum and decisions were made to incorporate the following changes in the curriculum.

The following courses were introduced.

- ❖ Human Computer Interaction
- ❖ Mobile Application Development
- ❖ Human Computer Interaction Lab
- ❖ Mobile Application Development Lab

Convener: Dr.M.Lakshmi, Dean, School of Computing

M. Lakshmi

External Members:

Academic Expert

- Mr. Somasundaram, Vice President, Maveric Systems, Chennai. *Somasundaram*
- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITTTR, Chennai. *T.G.Sambanthan*
- Mr.Singaravelu Ekambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai. *Singaravelu*

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu ,Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT

Handwritten signatures in blue ink corresponding to the list of internal members. The signatures are written over the text of the list items.



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Minutes of Board of Studies Meeting

Date: 12.12.2018 Time: 10.00 am Venue: IT Lab

Minutes of the BOS Meeting -2018 held on 12-12-2018

Agenda:

- 1) Review of 2015 and 2010 curriculum.
- 2) Updation of course contents
- 3) Addition of new courses

The Minutes of Meeting

The meeting was commenced by the welcome note of Prof.Dr.T.Sasikala, Convener, Board of Studies. The board of members reviewed the 2015 and 2010 curriculum and decisions were made to incorporate the following changes in the curriculum.

The following courses were introduced.

- ❖ Big Data
- ❖ Green Computing

Convener: Dr.T.Sasikala, Dean, School of Computing

External Members:

Academic Expert

- Mr. Somasundaram, Vice President, Maveric Systems, Chennai.
- Dr.T.G.Sambanthan, Professor & Head, Department of Computer Science & Engineering NITT Chennai.
- Mr.Singaravelu Ekambaram, Sr.Vice President, Cognizant Technology Solutions, Chennai.

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu ,Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT

Handwritten signatures in blue ink corresponding to the list members. The first signature is for Dr. R. Subashini, the second for Dr. P. Jeyanthi, the third for Dr. Maria Anu, and the fourth for Dr. S. Revathy.



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Minutes of Board of Studies Meeting

Date: 23.05.2017 **Time:** 10.30 am **Venue:** IT lab

Minutes of the BOS Meeting held on 23-05-2017

Agenda:

1. Review of 2010 and 2015 curriculum.
2. Updating the course contents
3. Approval of Following new courses:
 - (i) Compiler Design
 - (ii) System Software

The Minutes of Meeting

The commencement of the meeting was inaugurated by Prof.Dr.Lakshmi, Convener, Board of Studies. The board of members reviewed the 2015 and 2019 curriculum and decisions were made to incorporate the following changes in the curriculum.

- ❖ Contents of the following courses have been changed based on the feedback given by students and faculty members and students.
 1. SCS1301 -Operating System
 2. SCS1302 -Computer Graphics and Multimedia System
 3. SCS1305-Software Engineering
 4. SCS1306-Database Management System
 5. SCS1314-Data Communication and Computer Networks
 6. SCS4301-Operating System Lab
 7. SCS4302-RDMS Lab

- ❖ The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.

1. SCS1301-Compiler Design
2. SCS1304-System Software

Convener: Dr.Lakshmi, Dean, School of Computing

M. Lakshmi

External Members:

Academic Expert

- Mr.S.Chockalingam, Cisco Systems, Chennai
- Dr.A.Hema Murthy, Professor, Department of CSE, IIT, Chennai
- Mr.Harish, Project Manager, Infosys, Chennai.

Chockalingam

Hema

Harish

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu ,Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT

R. Subashini

P. Jeyanthi

M. Anu

S. Revathy

Note: Removed Contents are marked in Yellow color and
Added Contents are marked in red color

SCSX1011	OPERATING SYSTEMS (Common to CSE&IT)	L	T	P	Credits	Total Marks
		3	1	0	4	100

UNIT I INTRODUCTION

10 hrs.

Introduction – Operating system structures – System components – OS services – System calls – System structure – Resources – Processes – Threads – Objects – Device management – Different approaches – Buffering device drivers.

UNIT II PROCESS MANAGEMENT

10 hrs.

Processes – Process concepts – Process scheduling – Operations on processes – Cooperating processes – CPU scheduling – Basic concepts – Scheduling criteria – Scheduling algorithms – Preemptive strategies – Non-preemptive strategies.

UNIT III SYNCHRONIZATION AND DEADLOCKS

10 hrs.

The critical section problem – Semaphores – Classic problems of synchronization – Critical regions – Monitors – Deadlocks – Deadlock characterization – Prevention – Avoidance – Detection – Recovery.

UNIT IV MEMORY MANAGEMENT

10 hrs.

Storage Management Strategies – Contiguous vs. non-contiguous storage allocation – Fixed & variable partition multiprogramming – Paging – Segmentation – Paging/Segmentation systems – Page replacement strategies – Demand & anticipatory paging – File concept – Access methods – Directory structure – File sharing – Protection – File – system structure – Implementation.

UNIT V LINUX & SHELL PROGRAMMING

10 hrs.

Shell operation commands – Linux file structure – File management operation – Internet service – Telnet-FTP – Filters & regular expressions – Shell programming – Variable, arithmetic operations, control structures, handling date, time & system information.

REFERENCE BOOKS:

1. Abraham Silberschatz, Peter Galvin and Gagne, "Operating System Concepts"th, 6th Edition, Addison Wesley, 2002.
2. Harvey M. Deitel, "Operating System", 2nd Edition, Addison Wesley, 2000.
3. Gary Nutt, "Operating System, A modern perspective", 2nd Edition, Addison Wesley, 2000.
4. Richard Peterson, "Linux : The Complete Reference", 6th Edition, Tata McGraw Hills, 2007.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCS1301	OPERATING SYSTEM	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION

8 Hrs.

Introduction - Operating system structures - System components - OS services - System calls - System structure - Resources Processes - Threads - Objects - Device management - Different approaches - Buffering device drivers.

UNIT 2 PROCESS MANAGEMENT

9 Hrs.

Processes - Process concepts - Process scheduling - Operations on processes - Cooperating processes - CPU scheduling - Basic concepts - Scheduling criteria - Scheduling algorithms - Preemptive strategies - Non-preemptive strategies

UNIT 3 SYNCHRONIZATION AND DEADLOCKS

9Hrs.

The critical section problem - Semaphores - Classic problems of synchronization - Critical regions - Monitors-Dead locks - Deadlock characterization - Prevention - Avoidance - Detection - Recovery.

UNIT 4 MEMORY MANAGEMENT

9 Hrs.

Storage Management Strategies - Contiguous Vs. Non-Contiguous Storage Allocation - Fixed & Variable Partition Multiprogramming - Paging - Segmentation - Paging/Segmentation Systems - Page Replacement Strategies - Demand & Anticipatory Paging - File Concept - Access Methods - Directory Structure - File Sharing - Protection - File - System Structure - Implementation.

UNIT 5 I/O SYSTEMS, LINUX & SHELL PROGRAMMING

10 Hrs.

Mass Storage Structure - Disk Structure- Disk Scheduling - Disk Management - Swap Space Management - RAID Structure - Shell Operation Commands - Linux File Structure - File Management Operation - Internet Service - Telnet - FTP - Filters & Regular Expressions - Shell Programming - Variable, Arithmetic Operations, Control Structures, Handling Date, Time & System Information.

Max. 45 Hours.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Comprehend knowledge about operating system components and services.
- CO2 : Apply knowledge of process scheduling algorithms for a given context.
- CO3 : Analyze process synchronization and deadlock conditions.
- CO4 : Construct the process of Mapping logical address to physical address.
- CO5 : Design appropriate strategies for Paging, Segmentation.
- CO6 : Develop real time applications Based on Linux shell programming.

TEXT / REFERENCE BOOKS

1. Abraham Silberschatz, Peter Galvin and Gagne, "Operating System Concepts", 6th Edition, Addison Wesley, 2002.
2. Harvey M.Deitel, "Operating System", 2nd Edition, Addison Wesley, 2000.
3. Gary Nutt, "Operating System, A modern perspective", 2nd Edition, Addison Wesley, 2000.
4. Richard Peterson, "Linux : The Complete Reference", 6th Edition, Tata McGraw Hills, 2007.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 2 Questions from each unit, each carrying 2 marks

20 Marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCSX1023	COMPUTER GRAPHICS & MULTIMEDIA SYSTEM (Common to CSE & IT)	SL	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I BASICS OF COMPUTER GRAPHICS

10 hrs.

Output Primitives: Survey of computer graphics – Overview of graphics systems – Line drawing algorithm – Circle drawing algorithm – Curve drawing algorithm - Attributes of output primitives – Anti-aliasing

UNIT II 2D AND 3D CONCEPTS AND TRANSFORMATIONS

10 hrs.

Basic two dimensional transformations – Other transformations – 2D and 3D viewing – Line clipping – Polygon clipping – Logical classification – Input functions – Interactive picture construction techniques – Three dimensional concepts – Three dimensional transformations

UNIT III METHODS AND MODELS

10 hrs.

Visible surface detection methods – Illumination models – Halftone patterns – Dithering techniques – Polygon rendering methods – Ray tracing methods – Color models and color applications

UNIT IV BASICS OF MULTIMEDIA

10 hrs.

Introduction to multimedia – Multimedia skills – Multimedia building blocks – Text, sound, images, audio, animations – Making instant multimedia – Basic software tools – File Formats – JPEG, MPEG

UNIT V MULTIMEDIA TOOLS

10 hrs.

Introduction to Photoshop – Workplace – Tools – Navigating window – Importing and exporting images – Operations on Images – resize, crop, rotate. Introduction to Flash – Elements of flash document – flash environment – Drawing tools – Flash animations – Importing and exporting - Adding sounds – Publishing flash movies – Basic action scripts – GoTo, Play, Stop, Tell Target.

REFERENCE BOOKS:

1. Donald Hearn, Pauline Baker M., "Computer Graphics", ⁿ2^d Edition, Prentice Hall, 1994.
2. Tay Vaughan , "Multimedia", ^t5^h Edition, Tata McGraw Hill, 2001.
3. Ze-Nian Li, Mark S. Drew , "Fundamentals of Multimedia", Prentice Hall of India, 2004.
4. D. McClelland, L.U.Fuller , "Photoshop CS2 Bible", Wiley Publishing, 2005.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A : 2 Questions from each unit, each carrying 2 marks

20 marks

PARTB:2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCS1302	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 BASICS OF COMPUTER GRAPHICS

9 Hrs.

Output Primitives: Survey of computer graphics - Overview of graphics systems - Line drawing algorithm - Circle drawing algorithm - Curve drawing algorithm - Attributes of output primitives - Anti-aliasing.

UNIT 2 2D TRANSFORMATIONS AND VIEWING

8Hrs.

Basic two dimensional transformations - Other transformations - 2D and 3D viewing - Line clipping - Polygon clipping - Logical classification - Input functions - Interactive picture construction techniques.

UNIT 3 3D CONCEPTS AND CURVES

10 Hrs.

3D object representation methods - B-REP, sweep representations, Three dimensional transformations. Curve generation - cubic splines, Beziers, blending of curves- other interpolation techniques, Displaying Curves and Surfaces, Shape description requirement, parametric function. Three dimensional concepts – Introduction - Fractals and self-similarity- Successive refinement of curves, Koch curve and peano curves.

UNIT 4 METHODS AND MODELS

8Hrs.

Visible surface detection methods - Illumination models - Halftone patterns - Dithering techniques - Polygon rendering methods - Ray tracing methods - Color models and color applications.

UNIT 5 MULTIMEDIA BASICS AND TOOLS

10 Hrs.

Introduction to multimedia - Compression & Decompression - Data & File Format standards - Digital voice and audio - Video image and animation. Introduction to Photoshop - Workplace - Tools - Navigating window - Importing and exporting images - Operations on Images - resize, crop, and rotate - Introduction to Flash - Elements of flash document - Drawing tools - Flash animations - Importing and exporting - Adding sounds - Publishing flash movies - Basic action scripts - GoTo, Play, Stop, Tell Target.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Construct lines and circles for the given input.
- CO2 : Apply 2D transformation techniques to transform the shapes to fit them as per the picture definition..
- CO3 : Construct splines, curves and perform 3D transformations
- CO4 : Apply color and transformation techniques for various applications.
- CO5 : Analyze the fundamentals of animation, virtual reality, and underlying technologies
- CO6 : Develop photo shop applications. .

TEXT / REFERENCE BOOKS

1. Donald Hearn, Pauline Baker M., "Computer Graphics", 2nd Edition, Prentice Hall, 1994.
2. Tay Vaughan, "Multimedia", 5th Edition, Tata McGraw Hill, 2001.
3. Ze-Nian Li, Mark S. Drew, "Fundamentals of Multimedia", Prentice Hall of India, 2004
4. D. McClelland, L.U.Fuller, "Photoshop CS2 Bible", Wiley Publishing, 2005.
5. Jjames D. Foley, Andries van Dam, Steven K Feiner, John F. Hughes, "Computer Graphics Principles and Practice, 2nd Edition in C, Audison Wesley, ISBN - 981 -235-974-5.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSX1004	SOFTWARE ENGINEERING (Common to CSE & IT)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I INTRODUCTION

10 hrs.

S/W engineering paradigm –Life cycle models – Water fall – Incremental – Spiral – Evolutionary – Prototyping – Object oriented – System engineering – Computer based system – Verification – Validation – Life cycle process – Development process – System engineering hierarchy – Introduction to CMM – Levels of CMM.

UNIT II SOFTWARE ENGINEERING PROCESS

10 hrs.

Functional And Non-Functional – User – System – Requirement Engineering Process – Feasibility Studies –Requirements – Elicitation – Validation and management – Fundamental of requirement analysis – Analysis principles – Software prototyping – Prototyping in the Software Process – Rapid Prototyping Techniques – User Interface Prototyping – S/W Document Analysis and Modeling – Data – Functional and Behavioral Models – Structured Analysis and Data Dictionary.

UNIT III DESIGN PROCESS AND CONCEPTS

10 hrs.

Modular design – Design heuristic – Design model and document – Architectural design – Software architecture – Data design – Architecture data – Transform and transaction mapping – User interface design – User interface design principles.

UNIT IV BASIC CONCEPTS OF SOFTWARE TESTING

10 hrs.

Levels - Test activities - Types of s/w test - Black box testing - Testing boundary condition - Structural testing - Test coverage criteria based on data flow mechanisms - Regression testing - Testing in the large- S/W testing strategies - Strategic approach and issues - Unit testing - Integration testing - Validation testing - System testing and debugging. Case studies – Writing black box and white box testing.

UNIT V COST ESTIMATION & MAINTENANCE

10 hrs.

Software cost estimation – Function point models – COCOMO model – Quality management – Quality concepts – SQA – Software reviews – Formal technical reviews – Formal approaches of SQA and software reliability – Error tracking – Software maintenance – SCM - Need for SCM - Version control - Introduction to SCM process - Software configuration items. Re-Engineering – Software reengineering – Reverse engineering – Restructuring – Forward engineering.

REFERENCE BOOKS:

1. Pressman, “Software Engineering and Application”, th6Edition, Mcgraw International Edition, 2005.
2. Shooman. M.C , ”Software Engineering Design”, Mcgraw International Edition, 1985.
3. Richardairley, ” SoftwareEngineering-Design, Reliability And Management”, Mcgraw International Edition, 1983.
4. Sommerville, ”Software Engineering”, th6 Edition, Pearson Education, 2000.
5. Pfleeger, ”Software Engineering”, th6 Edition, Prentice Hall of India, 2005
6. Ghezzi, ”Software Engineering”, th2 Edition, Prentice Hall of India, 2005.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

PARTB:2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCS1305	SOFTWARE ENGINEERING	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION

9 Hrs

S/W engineering paradigm - Life cycle models - Water fall - Incremental - Spiral - Evolutionary - Prototyping - Object oriented system engineering - Computer based system - Verification - Validation - Life cycle process - Development process - System engineering hierarchy - Introduction to CMM - Levels of CMM.

UNIT 2 SOFTWARE ENGINEERING PROCESS

9 Hrs.

Functional And Non-Functional - User - System - Requirement Engineering Process - Feasibility Studies - Requirements - Elicitation - Validation and management - Fundamental of requirement analysis - Analysis principles-Software prototyping - Prototyping in the Software Process - Rapid Prototyping Techniques - User Interface Prototyping - Software Document Analysis and Modeling - Data - Functional and Behavioral Models - Structured Analysis and Data Dictionary.

UNIT 3 DESIGN PROCESS AND CONCEPTS

9 Hrs.

Design process - Modular design - Design heuristic - Design model and document - Architectural design - Software architecture - Data design - Architecture data - Transform and transaction mapping - User interface design - User interface design principles.

UNIT 4 BASIC CONCEPTS OF SOFTWARE TESTING

9 Hrs.

Levels - Software Testing Fundamentals - Types of s/w test - White box testing- Basis path testing - Black box testing - Control Structure testing- Regression testing - Testing in the large- S/W testing strategies - Strategic approach and issues - UNIT testing - Integration testing - Validation testing - System testing and debugging. Case studies - Writing black box and white box testing.

UNIT 5 COST ESTIMATION & MAINTENANCE

9 Hrs.

Software cost estimation - COCOMO model - Quality management - Quality concepts- SQA - Software reviews - Formal technical reviews - Formal approaches of SQA and software reliability - Software maintenance - SCM - Need for SCM - Version control - Introduction to SCM process - Software configuration items. Re-Engineering - Software reengineering - Reverse engineering - Restructuring - Forward engineering.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Select appropriate Software Development Lifecycle Model for a given requirement.
- CO2 : Comprehend various Functional and Non-Functional Requirements.
- CO3 : Create User Interface using Design concepts.
- CO4 : Generate Test cases for the developed Code.
- CO5 : Estimate Cost & Maintenance of the Project..
- CO6 : Generate an overall plan for a specific application

TEXT / REFERENCE BOOKS

1. Pressman, "Software Engineering and Application", 6th Edition, McGraw International Edition, 2005..
2. Shooman. M.C , "Software Engineering Design", McGraw International Edition, 1985.Compiler Principles, Techniques & Tools", Addison-Wesley Publishing Company, 1986
3. Richard Fairley, " Software Engineering - Design, Reliability And Management", McGraw International Edition, 1983.
4. Sommerville, "Software Engineering", 6th Edition, Pearson Education, 2000.
5. Pfleeger, "Software Engineering", 6th Edition, Prentice Hall of India, 2005
6. Ghezzi, "Software Engineering", 2nd Edition, Prentice Hall of India, 2005.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSX1018	DATABASE SYSTEM (Common to CSE, IT & ECE)	L	T	P	Credits	Total Marks
		3	1	0	4	100

UNIT I BASIC CONCEPTS

10 hrs.

Databases and databases users – Database system concepts and architecture – Data modeling using entity Relationship model – Enhanced entity relationship and object modeling – Record storage and file organizations – Index structures for files.

UNIT II DATABASE MODELS

10 hrs.

Introduction to Network – Hierarchical, Relational and Object Oriented Model – Relational Model – Relation algebra and calculus – Commercial query languages – Security and integrity – Functional dependency – Normalization – Relational database design.

UNIT III ADVANCED CONCEPTS

10 hrs.

Query processing – Crash recovery – Concurrency control – Distributed databases - Database security and authorization – Object oriented databases.

UNIT IV ORACLE DATABASE ADMINISTRATION

10 hrs.

Oracle architecture – Managing Oracle instance – Creation of database - Data dictionary and dynamic performance views.

UNIT V ORACLE DATABASE STRUCTURE AND STORAGE

10 hrs.

Data files and tablespaces – Control files – Redo log files and archived log files – Managing users and privileges – Managing password security and resources.

REFERENCE BOOKS:

1. Elmasri & Navathe, "Fundamentals of Database Systems", 3rd Edition, Addison Wesley, 2000.
2. Abraham Silberschatz, Henry.F.Korth and S.Sudharshan, "Database System Concepts", 4th Edition, 2002.
3. Jan L.Harrington, "Object Oriented Database Design", Harcourt India Pvt Ltd. 2000.(Unit III)
4. Kevin Loney & Marlene Theriault, "Oracle9i DBA Handbook", Tata McGraw-Hill, 2002. (Unit IV and V)
5. Michael Abbey, Michael Corey, Ian Abramson, "Oracle9i A Beginner's Guide", Tata McGraw-Hill, 2002. (Unit IV and V)
6. www.oracle.com (Unit IV and V)

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

PARTB:2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCS1306	DATABASE MANAGEMENT SYSTEM	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 INTRODUCTION TO DATABASES

9 Hrs.

Databases and Databases users - Database system concepts and architecture - Data modeling using Entity Relationship (ER) Model.
Relational Model - The Relational Data Model and Relational Database Constraints - The Relational Algebra and Relational Calculus.

UNIT 2 DATABASE DESIGN

9 Hrs.

Overview of the QBE Language - Overview of the Hierarchical Data Model - Overview of the Network Data Model - **SQL-99: Schema Definition, Constraints, Queries, and Views- Functional Dependencies and Normalization for Relational Databases.**

UNIT 3 QUERY PROCESSING

9Hrs.

Algorithms for Query Processing and Optimization - Introduction to Transaction Processing Concepts and Theory - Concurrency control techniques.

UNIT 4 RECOVERY AND SECURITY

9Hrs.

Database Recovery Techniques - Database Security - Distributed databases and Client- Server Architecture

UNIT 5 OBJECT DATABASE

9Hrs.

Concepts for Object Database - Enhanced Data Models for Advanced Application Emerging Database Technologies and Application

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Construct ER model for a given application..
- CO2 : Apply normalization on Relational Databases
- CO3 : Demonstrate query optimization and concurrent transaction processing
- CO4 : Analyse recovery techniques, security mechanism, fragmentation and load balancing of databases.
- CO5 : Design database using Object Oriented techniques...
- CO6 : Create database for a specified application

TEXT / REFERENCE BOOKS

1. Elmasri & Navathe - Fundamentals of Database Systems - 3rd Edition, 2nd Reprint, Addison Wesley, 2000
2. Abraham Silberschatz, Henry. F. Korth and S. Sudharshan "Database System Concepts", 4th Edition, 2002.
3. C. J. Date, "Introduction to database systems", Addison Wesley, 7th Edition, 2001.
4. Jan L. Harrington, "Object oriented database design", Harcourt India private limited

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

PART A : 10 questions of 2 marks each- No choice

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

Exam Duration : 3 Hrs.

20 Marks

80 Marks

SCSX1017	DATA COMMUNICATION & COMPUTER NETWORKS (Common to CSE, IT & EEE)	L	T	P	Credits	Total Marks
		3	1	0	4	100

UNIT I PROTOCOLS & MEDIA

10 hrs.

Introduction to data communication – Network protocols & standards – Line configuration – Topology – Transmission mode – Categories of networks – OSI model – Layers of OSI model – Transmission media – Guided media – Unguided media.

UNIT II SIGNALS & ERRORS

10 hrs.

Analog and digital signals – Encoding and modulation – Parallel and serial transmission – DTE/DCE – Types of errors – Error detection and correction – Data link control – Line discipline – Flow control – Error control.

UNIT III MULTIPLEXING & SWITCHING

10 hrs.

Multiplexing – Types of multiplexing – LAN – Project 802 – Ethernet – Token bus – Token ring – FDDI – MAN – IEEE 802.6 – Circuit switching – Packet switching.

UNIT IV ISDN & ATM

10 hrs.

History of analog and digital network – Access to ISDN – ISDN layers – Broadband ISDN – Packet layer protocol – ATM – ATM architecture – ATM layers – Congestion control – Leaky bucket algorithm.

UNIT V NETWORK & APPLICATION LAYER

10 hrs.

Repeaters – Bridges – Routers – Gateway – Routing algorithms – TCP/IP – Overview – Network layer – Transport and application layers of TCP/IP – DNS – SMTP – HTTP – WWW.

REFERENCE BOOKS:

1. Behrouz and Forouzan, "Data Communications and Networking", 2nd Edition, Tata McGraw Hill, 2007.
2. Andrew.S.Tenenbaum, "Computer Networks", 4th Edition, Prentice Hall of India, 2008.
3. William Stallings, "Data and Computer Communication", 6th Edition, Pearson Education, 2000.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

PARTB: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCS1314	DATA COMMUNICATION AND COMPUTER NETWORKS	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 DATA COMMUNICATION

9 Hrs.

Introduction to data communication - Network protocols & standards - Line configuration - Topology - Transmission mode - Categories of networks - OSI model - Layers of OSI model - TCP/IP Model - Transmission media- Guided media - Unguided media.

UNIT 2 DATALINK LAYER

9 Hrs.

Link layer services - Framing - Flow Control - Error control- Medium Access Control - Ethernet CSMA/CD - Token Ring - FDDI - Token Passing- Wireless LAN - CSMA/CA

UNIT 3 NETWORK LAYER

9 Hrs

Circuit Switching - Packet Switching - Routing - Distance Vector Routing - Link State Routing - Addressing- Subnetting - IPV4- IPV6- ARP - RARP - ICMP - IGMP - DHCP.

UNIT 4 TRANSPORT LAYER

9 Hrs.

TCP- UDP - Connection Management- Flow Control - Retransmission - Congestion Control - Detection and Avoidance.

UNIT 5 APPLICATION LAYER

9 Hrs.

Networking Devices - Repeaters - Switches - Bridges - Routers - Gateways- Domain Name System - FTP - WWW and HTTP - SNMP - SMTP - POP3 - IMAP - MIME.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course, student will be able to:

- CO1: Understand and explain the concept of Data Communication and networks, layered architecture and their applications.
- CO2: Evaluate data communication link considering elementary concepts of data link layer protocols for error detection and correction.
- CO3: Apply various network layer techniques for designing subnets and supernets and analyse packet flow on basis of routing protocols.
- CO4: Analyze and Set up protocol designing issues for Communication networks.
- CO5: Estimate the congestion control mechanism to improve quality of service of networking application
- CO6: Understand and design application layer protocols and internet applications such as network security, Email and DNS,

TEXT / REFERENCE BOOKS

1. Behrouz A. Fourouzan, "Data Communication and Networking", McGraw-Hill Education India Pvt. Ltd - New Delhi.
2. William Stallings, Data and Computer Communications (8th ed.), Pearson Education, 2007.
3. P.C. Gupta, Data Communications and Computer Networks, Prentice-Hall of India, 2006.
4. Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, Pearson.
5. L. L. Peterson and B. S. Davie, Computer Networks: A Systems Approach (3rd ed.), Morgan Kaufmann, 2003.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 questions of 2 marks each- No choice

20 Marks

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSX4013	OPERATING SYSTEMS LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

List of Experiments

1. Study of basic LINUX & Vi Editor command
2. Searching a SubString in given text
3. Menu Based Math Calculator
4. Printing pattern using loop statement
5. Converting File names from Uppercase to Lowercase
6. Manipulate Date/Time/Calendar
7. Showing various system information
8. Implementation of process scheduling mechanism – FCFS, SJF, Priority Queue.
9. Reader – Writer Problem.
10. Dinner's Philosopher Problem.
11. First Fit, Worst Fit, Best Fit allocation strategy.
12. Bankers Algorithm
13. Implement the producer consumer problem using Semaphore
14. Implement some memory management Scheme

SCS4301	OPERATING SYSTEM LAB	L	T	P	Credits	Total Marks
		3	0	0	3	100

1. Study of basic LINUX & vi Editor command
2. String and Numerical Handling Functions
3. Loop and Selection Constructs
4. File Handling Functions
5. Manipulate Date/Time/Calendar
6. Retrieve System information
7. Implementation of process scheduling mechanism – FCFS, SJF, Priority Queue.
8. Reader – Writer Problem.
9. Diner’s Philosopher Problem.
10. First Fit, Worst Fit, Best Fit allocation strategy.
11. Bankers Algorithm
12. Implement the producer consumer problem using Semaphore
13. Implement memory management Scheme

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Apply Linux Shell program for networking problems.
- CO2 : Analyze different types of scheduling algorithms for concurrent processes.
- CO3 : Formulate critical section problems for process synchronization.
- CO4 : Investigate cause and effect related to process deadlock.
- CO5 : Decide appropriate memory allocation strategy.
- CO6 : Create a real time application based on operating system concepts.

SCSX4011	RDBMS LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

List of Experiments

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Constraints and Oracle built-in Functions
4. Joins and Group-by Commands
5. Design and implementation of Payroll Processing System.
6. Design and implementation of Banking System.
7. Design and implementation of Student Information System.
8. Design and implementation of Quiz Application

SCS4302	RDBMS LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

1. Data Definition Language (DDL)
2. Data Manipulation Language (DML)
3. Data Control Language (DCL)
4. Constraints and built-in Functions
5. Joins and Group-by Commands
6. PL/SQL Program using functions
7. PL/SQL Program to create Triggers
8. Consider any application and design using.
 - a. Normalization
 - b. Data Flow Diagram
 - c. Entity-Relation Diagram
 - d. Data Dictionary
 - e. Table Structure

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Comprehend the underlying concepts of relational database management system
- CO2 : Analyze various DDL/DML/DQL/DCL commands in SQL.
- CO3 : Implement integrity constraints on a database using a state-of-the-art DBMS
- CO4 : Design a normalized database using normalization techniques
- CO5 : Create PL/SQL programs including stored Procedures, stored functions, cursors, triggers.
- CO6 : Design a schema for any given real world problem



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "B" by NAAC | Approved by AICTE



Minutes of Board of Studies Meeting

Date: 11.12.2017

Time: 10.30 am

Venue: IT Lab

Minutes of the BOS Meeting held on 11-12-2017

Agenda:

1. Review of 2010 and 2015 curriculum.
2. Updating the course contents of Existing Courses and Approval of following new courses
 - (a) Data Mining and Data Warehousing
 - (b) Data Analytics
 - (c) Cloud Computing
 - (d) Internet of Things
 - (e) R Programming
 - (f) Cloud Computing Lab

The Minutes of Meeting

The commencement of the meeting was inaugurated by Dr. Lakshmi Convener, Board of Studies. The board of members reviewed the 2010 and 2015 curriculum and decisions were made to incorporate the following changes in the curriculum.

- ❖ Contents of the following courses have been changed based on the feedback given by students and faculty members and students.
 1. SIT1302-Internet Programming
 2. SCS1316-Network Security
 3. SIT4301-Internet Programming Lab
- ❖ The following new courses have been introduced based on the suggestions given by Board of Studies External members and the stakeholders - Alumni and Employer.
 - (a) SIT1301-Data Mining and Data Warehousing

- (b) SIT1303-Data Analytics
- (c) SIT1304-Cloud Computing
- (d) SIT1619-Internet of Things
- (e) SCS1619-R Programming
- (f) SIT4302-Cloud Computing Lab

Convener: Dr.Lakshmi, Dean ,School of Computing

M. Lakshmi

External Members:

Academic Expert

- Mr.S.Chockalingam, Cisco Systems,Chennai
- Dr.A.Hema Murthy, Professor, Department of CSE, IIT, Chennai
- Mr.Harish, Project Manager, Infosys, Chennai.

Chockalingam

Hema

Harish

Internal Members:

- Dr.R.Subashini, Prof. and Head, IT
- Dr.P.Jeyanthi, Associate Professor, IT
- Dr.Maria Anu ,Associate Professor, IT
- Dr.S.Revathy, Associate Professor, IT

R. Subashini

P. Jeyanthi

M. Anu

S. Revathy

SITX1001	INTERNET PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I MARKUP LANGUAGE

10 hrs.

HTML - Structure of HTML documents - HTML elements - Mark up Tags for inserting URL, images, Tables, Multimedia components - Frames- Form and its objects - image maps - CSS. Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT II JAVA SCRIPT

10 hrs.

Advantages, Data Types, Variables, Operators, Control Statements, Functions, Objects and Arrays, Windows and Frames, Forms.

UNIT III EXTENSIBLE MARKUP LANGUAGE

10 hrs.

XML structure – elements, well formed XML, XML Namespaces - working with DTD- Adding DTDs to documents, defining DTD entities, defining Parameter entities - Working with attributes – Defining attributes, defining multiple attributes, using predefined attributes.

UNIT IV XML TRANSFORMATION LANGUAGES

10 hrs.

CSS basics - adding CSS to document, CSS selections, Controlling fonts - Need of XSL, XSL basics, XSL transformations, Introduction to Schemas- Defining simple elements and types. XML query, collecting and working data with CGI.

UNIT V ACTIVE SERVER PAGE

10 hrs.

Introduction to ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – Server side Active-X Components like Adrotator, Content linking and Rotator – Accessing database.

REFERENCE BOOKS:

1. Thomas A. Powell, "The Complete Reference HTML", Tata McGraw Hill,rd3 Edition
2. Thomas A. Powell and Fritz Schneider,"Java Script Complete Reference"ⁿ,^d2Edition, Tata McGraw Hill ",
3. Heather Williamson, " XML Complete Reference", Tata Mcgraw Hill,2001
4. Stephen Walther, Kevin Hoffman, Nate Dudek, "ASP . Net 4 unleashed", Pearson Education, 2010
5. Deitel & Deitel, Goldberg, "Internet and world wide web – How to Program", Pearson Education Asia, 2001.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

Part B: 2 Questions from each unit with internal choice, each carrying 12 marks

60 marks

Out of 80 marks, maximum of 30% may be asked in programming

SIT1302	INTERNET PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT 1 MARKUP LANGUAGE

9 Hrs.

Introduction to HTML - Structure of HTML, HTML elements - Mark up tags for inserting URL, Images, Tables, Frames - Form and its controls - Image maps - Client and Server Side – CSS – Inline – Internal and External - Multimedia components - Audio and Video - Dynamic HTML.

UNIT 2 JAVA SCRIPT

8 Hrs.

Introduction to JavaScript, Advantages, Data Types – Variables – Operators - Control Statements – Functions - **Objects – Array – Strings – Math – Boolean – Global - Date, and Number** - Windows and Frames - Forms and **Validation**.

UNIT 3 XML TECHNOLOGIES

10 Hrs.

Introduction to XML, XML structure – Elements - Well-formed XM -, XML Namespaces - Working with DTD - Adding DTDs to documents - Defining DTD entities - Defining Parameter entities - Working with attributes - Defining attributes - Defining multiple attributes - Using predefined attributes - CSS basics - Adding CSS to document - Need of XSL - XSL basics - XSL transformations - Introduction to Schemas - Defining simple elements and types - XML query.

UNIT 4 PHP

9 Hrs.

Introduction to PHP – Features - PHP Scripts - Data types – Variables – Operators - Controlling program flow - Working with arrays - Functions and classes - Working with files - Reading with Local and Remote files - Working with Database – Basics - Creating and populating database.

UNIT 5 ASP.NET

9 Hrs.

Introducing ASP.NET - ASP.NET namespaces - Creating and deploying ASP.NET applications - Web forms - Basic Web Controls - Working with events - Rich Web Controls : AdRotator Control - Calendar Control - Custom web Controls - Validation controls - Localising ASP.NET applications.

Max. 45 Hours.

COURSE OUTCOMES

On completion of the course, student will be able to:

- CO1 : Implement interactive web page(s) using HTML, CSS and DHTML.
- CO2 : Design and develop interactive Server Side executable web applications using Java Script.
- CO3 : Demonstrate well-formed XML, XSLT, DTD and XSL.
- CO4 : Build Dynamic web site using server side PHP Programming and Database connectivity.
- CO5 : Create and use ASP.NET applications.
- CO6 : Demonstrate web applications with Rich Web Controls.

TEXT / REFERENCE BOOKS

1. Thomas A. Powell, "The Complete Reference HTML", Tata McGraw Hill, 3rd Edition.
2. Thomas A. Powell and Fritz Schneider, "Java Script Complete Reference", 2nd Edition, Tata McGraw Hill
3. Heather Williamson, " XML Complete Reference", Tata McGraw Hill, 2001.
4. Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration: 3 Hrs.

PART A: 2 Questions from each unit, each carrying 2 marks

20 Marks

PARTB: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCSX1026	CRYPTOGRAPHY & NETWORK SECURITY (Common to CSE & IT)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I INTRODUCTION

10 hrs.

Services – Mechanisms and attacks – The OSI security architecture – A model for network security – Classical encryption technique – Symmetric cipher model – Substitution technique – Rotar machines – Steganography.

UNIT II BLOCK CIPHERS AND THE DATA ENCRYPTION STANDARD (DES)

10 hrs.

Simplified DES – Block Cipher principles – The Data Encryption Standard – The strength of DES – Confidentiality using symmetric encryption – Placement of encryption – Traffic confidentiality – Key distribution – Random number generation.

UNIT III PUBLIC KEY ENCRYPTION AND KEY MANAGEMENT

10 hrs.

Introduction to number theory – Public key cryptography and RSA – Key management – Diffie-hellman key exchange.

UNIT IV AUTHENTICATION AND HASH FUNCTIONS

10 hrs.

Authentication requirements – Authentication functions – Message authentication codes – Hash functions – Security of hash functions and MAC'S – MD5 (Message Digest Algorithm) – HMAC.

UNIT V NETWORK SECURITY

10 hrs.

Network security and system Security – Electronic mail security – IP security – Web security – Intruders – Malicious S/Ws – Firewalls.

REFERENCE BOOKS:

1. William Stallings, "Cryptography and Network Security", 2nd Edition, Prentice Hall of India, New Delhi, 1999.
2. Bruce Schneier, "Applied Cryptography", 2nd Edition, John Wiley and Sons, 1996.
3. Douglas R. Stinson, "Cryptography- Theory and Practice", CRC Press, 1995.

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks : 80

Exam Duration : 3 hrs.

Part A: 2 Questions from each unit, each carrying 2 marks

20 marks

Part B: 2 Questions from each unit with internal choice, each carrying 12 marks

60 marks

SCS1316	NETWORK SECURITY	L	T	P	Credits	Total Marks
		3	1	0	4	100

Unit 1 Network Security and Number theory Basics

Network security- Examples of security violations- Computer security concepts-confidentiality- Integrity-Availability-Accountability, Challenges of computer security- Hacking-Vulnerability-threats-attacks-passive attacks-types-Active attacks-types-Denial of service attacks-Model for network security. Modular arithmetic- Addition-Inverse-divisibility- prime numbers-Euler's theorem-Fermat's theorem

Unit -2 Cryptography Basics

Terminologies-Cryptography-Classification-based on operation, number of keys used, Processing- Crypt analysis –Types-Classical Encryption- Stream cipher, Substitution Cipher, Ceaser Cipher, Brute Force attack, Vignere Cipher-One time pad, Transposition Cipher -Simple row column Transfer, Play Fair Cipher, 2X2 Hill cipher- Rail fence Cipher-Block Cipher-Modes of operation,-DES- -AES-RSA algorithm

Unit -3 Security Functions and Data Security

Public Key Crypto system- Diffie-Hellmann Key Exchange-Key management Techniques-Hash Functions- Requirements-Hash Algorithm-MD5,SHA_1-Message Authentication Code (MAC)- HMAC- Digital Signature- User Authentication-Kerbroes-X.509 Certificates,X.509 Formats, Public Key Infrastructure- PKIX Architecture-Model- Management Functions

Unit- 4 Internet Security

Email Security-PGP-S/MIME- Secured Electronic Transaction-IP Security Overview- IPSec Documents-IPSec Services, IPSec Architecture, IP Traffic Processing-Encapsulating Security Payload-Internet key Exchange-Firewalls-Stateful Packet Inspection-Application Gateways/Proxies-Hybrid Systems

Unit -5 Computer System Security

Malicious Software- Types-Backdoor-Worms-Logic bomb-Trojan Horses-Viruses-Classifications- Virsus Kits-Email Viruses-Antivirus Approach-Distributed Denial of Service Attacks-Counter Measures-Intrusion Detection System (IDS),Network Based IDS-Host based IDS- Steps involved in deploying IDS

Text/ Reference Books:

William Stallings," Network System Essentials "-4th Edition
Atul Khahate, "Cryptography and network security",3rd Edition
Kuldeep Singh Kohar", Network Security", revised reprint 2011.

Max. 60 Hours

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 : Comprehend type of attacks and network security violations.
- CO2 : Apply ciphering techniques to secure data transfer
- CO3 : Analyse authentication techniques for different network scenarios..
- CO4 : Design Internet Protocol Security architecture to identify the vulnerability of the Internet systems..
- CO5 : Develop an intrusion detection system to find the attacks in networks.
- CO6 : Conduct a case study on recent threats and attacks.

TEXT / REFERENCE BOOKS

1. William Stallings, Cryptography and Network Security, 6th Edition, Pearson Education, March 2013.
2. Behrouz A. Forouzan, Debdeep Mukhopadhyay, Cryptography and Network Security, 2nd edition, McGraw Hill, 2012 .
3. William Stallings, "Network Security Essentials : Applications and Standards", Fourth Edition, Pearson Education.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

PART A : 10 questions of 2 marks each- No choice

PART B : 2 questions from each unit of internal choice, each carrying 16 marks

Exam Duration : 3 Hrs.

20 Marks

80 Marks

SITX4002	INTERNET PROGRAMMING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

List of Experiments

- Develop static pages (using Only HTML) of an online Book store. The website should consist the following pages.
 - Home page
 - Registration and user Login
 - User Profile Page
 - Books catalog
 - Shopping Cart
 - Payment By credit card
 - Order Conformation
- Mapping image on client & server side
- Add a Cascading Style sheet for designing the web page.
- Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.
- Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.
- Extracting contents of the XML document using DOM parser
- Using ActiveX Components in server side scripting.
- Create dynamic pages with database and server side scripting for quiz application.

SIT4301	INTERNET PROGRAMMING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

SUGGESTED LIST OF EXPERIMENTS

- Develop a static page using any 10 basic HTML elements.[Tags – Heading, Table, Marquee, Image, Style elements, etc.,]
- Develop static pages (using Only HTML) of an online Book store. The website should contain the following pages.
 - Home page
 - Registration and user Login
 - User Profile Page
 - Books catalog
 - Shopping Cart
 - Payment By credit card
 - Order Conformation
- Mapping image on client & server side
- Add a Cascading Style sheet (All types) for designing the web page.
- Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.
- Create and save an XML document at the server, which contains users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.
- Extracting contents of the XML document using CSS,XSLT,DOM parser
- Simple applications using XQuery
- Using ActiveX Components in server side scripting.
- Create dynamic pages with database and server side scripting for any application
- Programs using AJAX
- Programs using Maps
- Creation of Distributed Application using RMI
- Usage of Cookie
- Session Tracking using Servlets/JSP
- Accessing Database in a Servlet/JSP
- Database to Swing to Servlet/JSP communication

COURSE OUTCOMES :

- CO1 : To get familiar with basics of the Internet Programming.
- CO2 :. To acquire knowledge and skills for creation of web site considering both client and server side programming
- CO3 : To gain ability to develop responsive web applications
- CO4 :. To explore different web extensions and web services standards
- CO5 :. To learn characteristics of distributed applications
- CO6 : To be familiarized with AJAX and JSP