

SHRI G.S. INSTITUTE OF TECHNOLOGY & SCIENCE, INDORE
INFORMATION TECHNOLOGY DEPARTMENT

Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				Total credit
							End Sem	Class Work	Sessional Work	End Sem	
IT38501	DISTRIBUTED COMPUTING	3	-	2	3	1	70	30	40	60	4

PRE-REQUISITES:

COURSE OBJECTIVES:

This course is intended to teach/provide

1. Concepts, architectures, algorithms and programming models of distributed systems.
2. An exposure into the design and functioning of existing distributed systems.
3. Design and implementation of sample distributed systems and introduction to transactions.

COURSE OUTCOMES: After completion of course, students will be able to:

- CO1** Recognize the fundamental features and challenges of distributed system.
CO2 Illustrate the conceptual models of distributed system.
CO3 Identify the networking issues for distributed systems.
CO4 Summarise the distributed file system components and name services.
CO5 Explain time issues, coordination and agreement within distributed system.
CO6 Describe transaction and concurrency control in distributed system.

THEORY:

COURSE CONTENTS:

UNIT 1: Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web Challenges, Architectural Models, Fundamental Models. The Operating System Layer, Protection, Processes and Threads, Communication and Invocation.

UNIT 2: Networking issues for distributed systems: External Data Representation and Marshalling Group Communication, Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Calling, Events and Notifications, Java RMI Case Study.

UNIT 3: Distributed File Systems: Introduction, File Service Architecture, Sun Network File System, The Andrew File System, Recent advances, Name Services and the Domain Name System, Directory and Discovery Services, Case study of the Global Name Service and X.500 Directory Service.

UNIT 4: Global States & Coordination: Introduction, Clocks, Events, and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed debugging, Failure Detectives, Distributed Mutual Exclusion, Elections, Multi cast Communication, Consensus and Related Problems.

UNIT 5: Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery, Case Study of CORBA: CORBA RMI, CORBA Services.

TEXT BOOKS RECOMMENDED:

1. G. Coulouris, J. Dollimore, T Kindberg, “Distributed Systems: Concepts and Design”, AddisonWesley Longman.
2. R 8:00-9:15am, in A008 Root HaM. L. Liu, “Distributed Computing - Principles and Application”, Pearson Education.
3. S. Tanenbaum, “Distributed Systems - Principles and Paradigm”, Pearson Education.

REFERENCE BOOKS:

1. S. Tanenbaum, “Distributed Operating Systems”, Prentice Hall India, 1996.
2. P.K. Sinha, “Distributed Operating Systems - Concept and Design”, Prentice Hall

ASSESSMENT TOOLS :

Direct assessment: End-Sem Examination, Mid-Term Test, Class Assignments, Quiz, Attendance

Indirect assessment: Course End Survey

PRACTICAL:

LAB ASSIGNMENTS:

Assignment 1

Develop a client to client chat application using Java Sockets.

Assignment 2

Develop a peer to peer multicast application (concept of chat rooms).

Assignment 3

To create an application with remote calculator functionality using the Remote Method Invocation.

Assignment 4

To develop an application based on the concept of mobile code using Applets.

Assignment 5

To create an online Auction Application using Callbacks

Assignment 6

To code a basic application using Remote Procedure call.

Assignment 7

Identify steps of basic application creation using CORBA (Common Object Request Broker Architecture).

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or '-')

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	P O 10	P O 11	P O 12	PSO 1	PSO 2	PSO 3
CO 1	1	2	1	-	-	-	-	-	-	-	-	-	1	1	-
CO 2	3	2	3	-	-	-	-	-	-	-	-	-	3	3	-
CO 3	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
CO 4	1	2	1	-	-	-	-	-	-	-	-	-	1	1	-
CO 5	2	2	2	-	-	-	-	-	-	-	-	-	2	2	2
CO 6	2	2	2	-	-	-	-	-	-	-	-	-	2	2	2

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INFORMATION TECHNOLOGY DEPARTMENT

Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				Total Credit
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IT38513	DATABASE MANAGEMNET SYSTEM	3	1	2	3	1	70	30	40	60	4

PRE-REQUISITES: Basic knowledge of set theory and Operating System

COURSE OBJECTIVES:

1. To describe the role of the database administrator.
2. To provide the knowledge of database management in an organization.
3. To construct simple and moderately advances database queries using SQL.

COURSE OUTCOMES: After learning this course students will be able to:

- CO1** Describe the concepts of database management system, its architecture and its applications.
- CO2** Design entity relationship diagram and convert it into relational model.
- CO3** Use the concepts of SQL in database creation and interaction.
- CO4** Illustrate the concept of Functional Dependency, problem of different anomalies, and how it will overcome through normalization.
- CO5** Compare the basic database storage structures and access techniques; file organization, and indexing method.
- CO6** Describe the concepts of transaction processing and concurrency control.

THEORY:

COURSE CONTENTS:

UNIT 1: Introduction: database, database users, comparison to conventional system, characteristics of databases. Data models, schemas and instances, DBMS architecture and data independence, database languages and interfaces, classification of DBMS. Data modeling using ER-model : Basic concepts, weak entity types, ER-diagrams, subclasses, super classes, and inheritance, specialization and generalization.

UNIT 2: Relational data model and relational algebra: relational data model concept, Constraints- key: super key, primary key, and candidate key, Integrity Constraints- Referential Integrity. Update operations, basic relational algebra operations, additional relational operations. SQL: data definition and update statements, basic queries in SQL, views, functions, constraints, joins and nested queries, co-related queries, Indexing, and PL/SQL.

UNIT 3: Functional dependencies and normalization: Features of good relational designs, database design approaches, anomalies, functional dependencies - Definition and rules of axioms, 1NF, 2NF, 3NF and BCNF. Dependency preservation, properties, loss less join decomposition, decomposition using multi valued dependency, more normal forms.

UNIT 4: Record storage and file organization: secondary storage devices, file of ordered records and file of unordered records, Hashing Techniques: Internal Hashing, External Hashing for Disk Files, RAID. Index structure for files: single level ordered indexes, multi level indexes, dynamic multilevel indexes using B-Tree and B⁺ Tree. Query Processing and Optimization: steps of query optimization.

UNIT 5: Introduction to transaction processing: transaction and system concepts, desirable properties of transactions, schedules and recoverability, serializability of schedules, types of serializability and test for serializability, locking techniques for concurrency control, concurrency control based on timestamp ordering. Multiversion schemes. Recovery: Basic concepts, techniques based on deferred update and immediate update, Shadow paging, check points.

TEXT BOOKS RECOMMENDED:

1. Elmasri and Navathe , “Fundamentals of database systems”,6th edition, Pearson Education.
2. Silberschatz–Korth–Sudarshan , “Database System Concepts ”,5th edition, McGraw-Hill.
3. C. J. Date, “Introduction To Database Systems” ,8th edition, Pearson Education.

REFERENCE BOOKS:

1. C. J. Date, “Introduction To Database Systems” , 8th edition, Pearson Education.
2. Raghu Ramakrishnan and Johannes Gehrke,”Database Management Systems”,Tata McGraw Hill.
3. Alexis Leon, Mathews Leon,Leon,”Database Management Systems”, Vikas Publishing, Chennai.

ASSESSMENT TOOLS :

Direct assessment: End-Sem Examination, Mid-Term Test, Class Assignments, Quiz, Attendance

Indirect assessment: Course End Survey

PRACTICAL:

LAB ASSIGNMENTS:

1. Design and build an Entity Relationship diagram using designing tool.
2. To study and execute the DDL commands in RDBMS. (DDL commands: CREATE, ALTER, DROP, RENAME and TRUNCATE).
3. To study and execute DML commands in RDBMS. (DML COMMANDS: INSERT ,UPDATE,DELETE,SELECT)
4. Study and execute sql commands using aggregate functions.
5. Study and execute the sql commands using primary and foreign key constraints.
6. Study and execute sql commands using sql JOINS

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or '-')

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O 1	PS O 2	PSO 3
CO 1	3	2	1	1	-	-	-	-	-	-	1	1	2	1	-
CO 2	3	2	3	2	2	-	-	-	-	-	1	1	3	1	-
CO 3	3	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO 4	3	2	-	-	-	-	-	-	-	-	1	1	1	-	-
CO 5	3	1	-	-	-	1	-	-	-	-	1	1	1	1	-
CO 6	3	2	-	2	1	1	-	-	-	-	1	1	1	1	-
Avg	3	1.8	2	1.6	1.5	1					1	1	1.5	1	

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Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				
							End Sem	Class Work	Sessional Work	End Sem	Total Credit
IT38504	WEB ENGINEERING	3	-	2	3	1	70	30	40	60	4

PRE-REQUISITES: Basic understanding of PYTHON, Computer Networks.

COURSE OBJECTIVES:

This course is intended to teach the

1. Fundamentals of how the Internet and the Web functions
2. Developing static, dynamic and active documents.
3. A general grounding introduction to more advanced topics such as XML, web services, search engines and security aspects of web.

COURSE OUTCOMES: After completion, of course, students will be able to:

- CO1** Understand the role of Internet, Internet protocols, HTML5, Java Script and CSS for web application development.
- CO2** Create dynamic pages using CGI technology.
- CO3** Design web applications using JSP, Servlet.
- CO4** Explain XML based technologies including web services.
- CO5** Explain the search engine and associated technology.
- CO6** Identify the requirements of secure web application development.

THEORY:

COURSE CONTENTS:

UNIT 1: History of internet protocols, the concept of www, Internet: working concepts and architecture models, basic tools and methods of internet access, ISPs, types of servers, client-server architecture. HTTP: request and response message, the statelessness of HTTP, URLs, Browsers: working, types, architecture examples, helper application, plugin.

UNIT 2: Technologies for Web Applications: Types of web documents: static, dynamic and active, Language for creation of each type of documents, an overview of a web page development language, HTML, DHTML, HTML5 Basic Concepts, Elements, Linking in HTML, Introduction to CGI, the life cycle of CGI, Introduction to Python, Writing CGI programs in python.

UNIT 3: CGI v/s Servlets, the life cycle of servlets, servlet creation in JAVA, doGet, and doPost method implementation, parameters handling, Setting path and classpath variables, tomcat architecture, WAR file creation. Introduction to Java Server Pages technology, JSP tags, Session Management: methods of session management, Creating Active Pages: Java Applets basics, applet life cycle, simple hello world applet.

UNIT 4: Introduction to XML, XML Parser, XML DTD, XML with XSLT. Web Services, advantages of web

service over web application, web service architecture. Introduction to the semantic web. Search Engines:

architecture, crawler, robot's exclusion protocol, search engines types, working, examples.

UNIT 5: Web site planning, designing and management issues, Web security issues, Introduction to Web Server, deploy website on Web Server, Firewalls: types of firewall, Introduction to MVC architecture using tools like J2EE framework, Struts, etc., Digital signature: public key, private key and session key, NAT, VPN.

TEXT BOOKS RECOMMENDED:

1. Kahate & Godbole "Web technologies" Tata McGraw Hill.
2. Thomas A. Powell HTML& CSS: The Complete Reference (English) 5th edition McGraw Hill.
3. Gopalan & Akilandeshwari, "Web technologies-A Developer's Perspective," Prentice Hall of India.

REFERENCE BOOKS:

1. Herbert Schild, "Complete Reference" 7th edition Tata McGraw Hill.
2. Andrew S Tanenbaum, "Computer Networks," 5th edition, Pearson Education.
3. Behrouz A forouzan, "TCP/IP protocol suite," 2nd edition, Tata McGraw Hill.

ASSESSMENT TOOLS:

Direct assessment: End-sem examination, mid-semester test, class assignments, attendance

Indirect assessment: Course End Survey

PRACTICAL:

LAB ASSIGNMENTS:

1. Installations along with configuration of Tools and mini project (Web-based) discussion.
2. Create web pages using HTML
3. Create Style web pages using the Cascading Style Sheet
4. Validate web pages using Javascript
5. Simple CGI program using Python
6. Advanced CGI program using Python
7. Create web pages using JSP
8. Implementation of Model-View-Controller architecture
9. JSP and Servlet connectivity with databases
10. Web-Based Project presentation

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or '-')

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	2	2	1	3	-	-	3	2	-	-	2	2	2	1
CO2	1	2	3	2	3	-	-	3	2	-	-	3	3	3	1
CO3	1	2	3	2	3	-	-	3	3	1	1	3	3	3	2
CO4	1	1	1	2	2	-	-	-	-	-	-	2	2	3	2
CO5	2	2	2	2	2	-	-	-	-	-	-	1	2	2	2
CO6	1	2	2	2	2	-	-	-	-	-	-	1	3	3	2

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Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				Total Credits
							End Sem	Class Work	Sessional Work	End Sem	
IT38506	COMPILER DESIGN	3	0	2	3	1	70	30	40	60	4

PRE-REQUISITES: Theory of computation, Data Structures

COURSE OBJECTIVES:

This course is intended to teach the

1. Design principles of a Compiler and different levels of translation.
2. Design and implementation of a lexical analyser and parser.
3. Concept of type conversion and runtime environment.
4. Optimization and effective generation of machine codes.

COURSE OUTCOMES: After completion of the course, students will be able to:

- CO1** Apply the knowledge of the structure of compiler and lexical analysis phase.
- CO2** Design parsers for a given parser specification manually or using tools.
- CO3** Apply the concept of syntax directed translation (SDT) in various situations.
- CO4** Explain the concept of runtime environment and different optimization techniques.
- CO5** Produce different forms of intermediate codes for given source code.
- CO6** Apply analysis methods and apply different optimizations on given code.

THEORY:

COURSE CONTENTS:

UNIT 1: Introduction to compiling & Lexical Analysis: Introduction of Compiler, Major data Structure in compiler, BOOT Strapping & Porting, Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, Lexical analysis: Input buffering, Specification & Recognition of Tokens, LEX.

UNIT 2: Syntax Analysis & Syntax Directed Translation, Syntax analysis: CFGs, Top-down parsing, Brute force approach, recursive descent, parsing, transformation on the grammars, predictive parsing, bottom-up parsing, operator, precedence parsing, LR parsers (SLR, LALR, LR), Parser generation. Syntax directed, definitions: Construction of Syntax trees, Bottom-up evaluation of S-attributed definition, L-attribute definition, Top-down translation, Bottom-Up evaluation of inherited attributes, Recursive Evaluation, Analysis of Syntax directed definition.

UNIT 3: Type Checking & Run Time Environment: Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation, Symbol table.

UNIT 4: Code Generation: Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation: Issues

in the design of code generator, Basic block and flow graphs, register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code from DAG.

UNIT 5: Code Optimization: Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations, Data flow analysis of structure flow graph Symbolic debugging of optimized code.

TEXT BOOKS RECOMMENDED:

1. A. V. Aho, R. Sethi, and J. D. Ullman. "Compilers: Principles, Techniques and Tools", Pearson Education.
2. Keith D Cooper and Linda Torczon, "Engineering a Compiler", Morgan Kaufmann Publishers Elsevier Science.

REFERENCE BOOKS:

1. Louden, "Compiler Construction: Principles and Practice", Cengage Learning.
2. A. C. Holub, "Compiler Design in C", Prentice-Hall Inc., 1993.
3. Mak, "writing compiler & Interpreters", Wiley Pub. India.

ASSESSMENT TOOLS :

Direct assessment: End-Sem Examination, Mid-Term Test, Class Assignments, Quiz, Attendance

Indirect assessment: Course End Survey

PRACTICAL:

LAB ASSIGNMENTS:

1. Write a C program to convert an infix expression to postfix expression.
2. Write a C program to calculate the value of postfix expression.
3. Write a C program to identify whether a given line is a comment or not.
4. Write a C program to recognize strings under 'a', 'a*b+', 'abb'.
5. Construct the LEX program to
 - remove spacing and punctuation in typed input text.
 - recognize string having 100 as substring.
 - recognize string starting with 0 and ending with 1.
 - recognize binary string divisible by 3.
 - recognize string that consist substring a or a*b+.
- 6 Construct a LEX program to
 - recognize a valid identifier. A valid identifier starts with '_' or a letter and contains letters, digits and '_'.
 - Identify whether a given line is a comment or not. A comment line starts with '//'.
• Count number of characters, lines and words in an input file.
 - Remove all the comments from a file. Single line comment starts with '/' and multiline comment starts with '/*' and ends with '*'.
- 7 Write a LEX program that read a text file, recognize tokens and copy all lexemes found with their token type in another file each in separate line
- 8 Write YACC and LEX program to implement a calculator.
- 9 Write a C program to implement LL (1) parser.
- 10 Write a C program to implement LR (0) parser.

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or '-')

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3		3								3	3	2
CO2	3	3	3		3								3	3	2
CO3	3	2	3										3	3	2
CO4	3	2	2										3	3	2
CO5	3	3	3										3	3	2
CO6	3	3	2										3	3	2

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Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				Total Credits
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IT38509	ADVANCED COMPUTRER NETWORKS	3	-	2	3	1	70	30	40	60	4

PRE-REQUISITES: Basic understanding of Computer Networks.

COURSE OBJECTIVES:

This course is intended to teach the:

1. Principles of Network applications.
2. Socket programming with TCP and UDP.
3. The infrastructure for network management.
4. Transport-layer services and principles of congestion control.
5. Internet Protocol and Routing in the Internet.

COURSE OUTCOMES: After completion, of course, students will be able to:

- CO1** Extend the knowledge of computer networks course to advance networking concepts.
CO2 Study the TCP/IP protocols as being used in real world the internet.
CO3 Describe the working of realistic and efficient network applications and their architecture.
CO4 Explain the working of network management in real world for large infrastructure network.
CO5 Compute the efficiency of various protocols through simulations and modelling.
CO6 Operate the various protocols through simulators or on text-beds.

THEORY:

COURSE CONTENTS:

UNIT 1: Introduction: review of computer networks, TCP/IP protocol stack, addressing, routing. Network Programming: review of socket programming, programming various TCP/IP protocols. Introduction to IPv6.

UNIT 2: Introduction to optical networks, Advanced network layer concepts: intra: AS routing in the Internet, RIP, OSPF, Inter-autonomous system routing: BGP, broadcast and multicast routing, **Content Addressable Networks, DHT, Pastry, IPV6 Addressing, Network Simulation.**

UNIT 3: Advanced concepts in transport layer protocols, Review of TCP and UDP Basics, Connection management, TCP state transition diagram, delayed acknowledgement,

Nagel's algorithm, window size advertisement, sliding windows, TCP timeout and retransmission, flow control, congestion control, **multipath TCP, TCP Pacing and TCP low priority.**

UNIT 4: Network management: general structure of network management, infrastructure for network management, Internet standard network management framework: SNMP protocol, Structure of Management Information, Management Information Base, SNMP protocol operations and transport mappings, **Software Defined Networking (SDN) and Openflow.**

UNIT 5: Protocols for real-time interactive applications: RTP, RTP packet header fields, RTP control protocol, Session Initiation Protocol, Scheduling mechanisms: FIFO, RR and Weighted Fair Queuing, Policing: the leaky bucket, IntServ model, DiffServ model, MPLS, Reservation Protocol (RSVP): operation, reservation style and message format.

TEXT BOOKS RECOMMENDED:

1. James F. Kurose and Keith W Ross, "Computer Networking: A top-down approach featuring the internet", 3rd Edition, Pearson Education.
2. W. Richard Stevens and G. Gabriani, "TCP/IP illustrated vol.1, the protocols", 2nd Edition Pearson Education.
3. William Stallings, "Computer Networks", Pearson Education.

REFERENCE BOOKS:

1. Andrew S. Tanenbaum "Computer Networks", 4th Edition, Prentice Hall of India
2. Peterson and Davie "Computer Networks: A Systems Approach" 2nd Edition

ASSESSMENT TOOLS:

Direct assessment: End-Sem Examination, Mid-Term Test, Class Assignments, Quiz, Attendance

Indirect assessment: Course End Survey

PRACTICALS:

LAB ASSIGNMENTS:

1. Installation of Wireshark.
2. Using Wireshark to explore Http Protocol.
3. Using Wireshark to take a closer look at the client side of DNS after HTTP protocol.
4. Implementing Socket Programming.
5. Using Wireshark trace files for NAT Protocol.
6. Analyze NAT protocol using NET-SIM.
7. Analyze OSPF protocol using NET-SIM.
8. Analyze IGMP protocol using NET-SIM.
9. Analyze TCP Window Scaling using NET-SIM.
10. Design a simple scenario using NET-SIM.

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or '-')

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	1	1	-	-	-	-	-	-	-	-	-	1	3	1	2
CO2	2	2	2	1	1	-	-	-	-	-	-	1	3	2	2
CO3	2	2	2	3	3	-	-	-	-	-	-	1	3	2	2
CO4	1	1	2	3	1	-	-	-	-	-	-	1	3	2	2
CO5	3	3	3	2	2	-	-	-	-	-	-	1	3	2	2
CO6	1	1	1	1	1	-	-	-	-	-	-	1	3	2	2

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Subject Code	Subject Name	L	T	P	Th. Credit	Pr. Credit	Maximum Marks				
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IT38951	SSL IV	-	-	2	-	1			40	60	1

PRE-REQUISITES: C, C++, Java.

COURSE OBJECTIVES:

1. Understand the various parts of an Android Project.
2. Implement various applications using Android.

COURSE OUTCOMES: After the completion of the course, the students will be able to:-

- CO1** Explain basic components of an Android application and its complete architecture.
- CO2** Demonstrate basic skills of using an integrated development environment (Android Studio) and Android Software Development Kit (SDK) for implementing Android applications.
- CO3** Create simple android application e.g. calculator, etc and complex application using the major components of Android API set.
- CO4** Apply various concepts of android programming and create applications using UI widgets like intents, fragments, and text.
- CO5** Describe android application database.
- CO6** Demonstrate and implement the different android application on a physical device

THEORY:

COURSE CONTENTS:

UNIT 1: Android OS concepts: Introduction of android, dalvik virtual machine & .apk file extension fundamentals, android development environment setup, development tools, creating & setting up custom android emulator, android project framework and its applications.

UNIT 2: Android Architecture: architecture framework, Linux kernel, libraries, android run time application framework, android startup and zygote, debug bridge, permission model, android manifest file, android API levels (version & version names).

UNIT 3: Activities and UI Design: Ui layout, android application components intent, activity, activity life cycle, broadcast receivers services and manifest, expressions and flow control, android manifest, simple UI layouts and layout properties.

UNIT 4: Advanced UI Programming: event driven programming (text edit, button clicked etc.), creating a splash screen, introduction to threads in android, android themes, toast in android.

UNIT 5: Working with database: Sq Lite programming, Sq Lite open helper and create database, open and close a database, cursor, Reading and updating contacts, reading bookmarks, develop an app to demonstrate database usage, CRUD operations, Grid View & List View.

TEXT BOOKS RECOMMENDED:

1. Mark L. Murphy, “ Beginning Android”, Wiley India Pvt. Ltd., 2009
2. Neil Smyth, “Android Studio Development Essentials”, CreateSpace Independent Publishing.
3. Michael Owens, “The Definitive Guid to SQLite” 2nd Edition Apress.

REFERENCE BOOKS:

1. Zigurd Mednieks, “Programming Android”, Second Edition O’reilly Publication.
2. Chris Haseman, “Beginning Android Programming: Develop and Design”, 1/e Pearson Education.

PRACTICAL:

LAB ASSIGNMENTS:

Create a "Hello World" Android Application, Run "Hello World" on the Emulator.

1. Create a login page, registration page and on successful login in application.
2. Create application with Basic Views (Textview, Button, ListView)
3. Create application with different Layouts (Linear, Relative, Frame)
4. Create a BMI calculator.
5. Develop an application for page colour change using different button.
6. Develop a standard calculator application to perform basic calculations like addition, subtraction, multiplication and division.
7. Develop a mobile application that uses GPS location information.
8. Develop a mobile application that creates alarm clock.
9. Create application using Maps api, it should display marker on current location of user.
10. Write an application that draws basic graphical primitives on the screen.
11. Develop an application that makes use of database.

ASSESSMENT TOOLS:

Direct assessment: Lab Assignments, Quiz, Viva-Voce examination (Internal and External), Attendance, Written Test

Indirect assessment: Course End Survey, External Examiner Feedback

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES (H-3, M-2, L-1, or ‘-’):

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	1	1	-	-	-	1	-	-	1	2	2	1
CO2	3	3	1	1	1	-	-	-	-	-	-	1	2	2	1
CO3	3	3	1	1	1	-	-	-	-	-	-	1	2	2	1
CO4	3	2	1	1	1	-	-	-	1	-	-	1	2	2	1
CO5	3	2	1	1	1	-	-	-	-	-	-	1	2	2	1
CO6	3	2	1	-	-	-	-	-	-	-	-	1	2	2	1