P.G. Department of Computer Science
S.N.D.T. Women's University, Mumbai.
Syllabus- MCA. (w.e.f. from 2013-14 Batch)

Branch: MCA	Semester-V
Subject Code: 5101	Lecture: 04 Credit: 04
Subject Title	ADVANCED WEB TECHNOLOGY

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age
UNIT-I	1	**General:** HTTP: Overview – HTTP Basics, Client request, Server response; HTTP Headers; Session Management – Persistent connections, Cookies. General concepts on web server: Configuration & Administration; virtual hosting General concepts of caching proxy server, Web security SSL, Digital signatures; Authentication.	8	16
UNIT-II	2	**Client side technologies** HTML: Structure of HTML Document – Meta tags, Links, Text, Lists, Tables, Inclusions (Objects, Images, applets and Multimedia contents);Presentation of HTML document – Style sheets, Alignment, fonts, frames; Interactive HTML document – Forms, Scripts. XML: Well-formed, Valid document, Document Type Definitions and Document Object Model Client Side JavaScript: Object Reference – Objects. Methods and Properties, Event Handlers; Language constructs – Statements and Operators.	12	24
UNIT-III	3	PERL & CGI CGI architecture Intro PERL with Features, Working with Strings and Arrays, File Handling, Pattern matching & formatting, Creating and using subroutines, Using PERL for CGI scripting Java Servlets & JSP Active Server Pages: Overview, Request, Response, Applications, Sessions, Cookies, Data Store Access, Web Applications. SSI: SSI Directives; SSI Environment Variables; SSI Formats.	10	20
UNIT-IV	4	Apache Tomcat Server Obtaining and Installing Apache Tomcat, Tomcat Directory Structure - bin, conf, logs, server, work, temp, webapps, Web Application Directory Structure, Deploying HTML and JSP Pages, Configuring Tomcat - Editing server.xml, Deploying Web Applications - Deployment Descriptors, web.xml configuration file Tomcat Manager - Deploying and Managing Web	10	20

		Application using the Tomcat Manager, Creating a WAR File Configuring Tomcat to Connect to a Database Configuring Security on Tomcat, Granting Permissions to Java Apps		
	5	Servlet vs CGI, Servlet API Overview Servlet Life Cycle , Coding: Writing & running simple servlet Generic servlet, HTTPServlet, ServletConfig, ServletContest Writing servlet to handle Get & Post methods, reading use request data , Session tracking in servlets, Servlets & JDBC. Writing threadsafe servlet	8	16
	6	Spring MVC Architecture	2	4

References:
1. Beginning Web Programming with HTML, XHTML, CSS & JavaScript by Jon Duckett, Wrox.
2. Webmaster in a Nutshell by Stephen Spainhour, O'Reilly and Associates.
3. JavaScript: The Definitive Guide by David Flanagan, O'Reilly and Associates.
4. Beginning ASP 3.0 by David Buser and Others, Wrox.

Branch: MCA	Semester-V
Subject Code: 5102	**Lecture: 04** **Credit: 04**
Subject Title	**RESEARCH METHODOLOGY**

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age
UNIT-I	1	Research methodology: An Introduction Objectives of Research, Types of Research, Research Methods and Methodology, Defining a Research Problem, Techniques involved in Defining a Problem.	4	08
	2	Research Design Need for Research Design, Features of Good Design, Different Research Designs, Basic Principles of Experimental Designs, Sampling Design, Steps in Sampling Design, Types of Sampling Design, Sampling Fundamentals, Estimation, Sample size Determination, Random sampling.	6	12
UNIT-II	3	Measurement and Scaling Techniques Measurement in Research, Measurement Scales, Sources in Error, Techniques of Developing Measurement Tools, Scaling, Meaning of Scale, Scale Construction Techniques.	10	20
	4	Methods of Data Collection and Analysis Collection of Primary and Secondary Data, Selection of appropriate method Data Processing Operations, Elements of Analysis, Statistics in Research, Measures of Dispersion, Measures of	8	18

Modules	Sr. No	Topic	No. of Lectures required	Weightage in marks
		Skewness, Regression Analysis, Correlation.		
UNIT-III	5	Techniques of Hypotheses, Parametric or Standard Tests Basic concepts, Tests for Hypotheses I and II, Important parameters limitations of the tests of Hypotheses, Chi-square Test, Comparing Variance, As a non-parametric Test, Conversion of Chi to Phi, Caution inusing Chi-square test.	12	24
UNIT-IV	6	Analysis of Variance and Co-variance ANOVA, One way ANOVA, Two Way ANOVA, ANOCOVA Assumptions in ANOCOVA, Multivariate Analysis Technique Classification of Multivariate Analysis, factor Analysis, R-type Q Type factor Analysis, Path Analysis	10	20

References:

1. "Research Methodology", C.R. Kothari, Wiley Eastern.
2. "Formulation of Hypothesis", Willkinson K.P, L Bhandarkar, Hymalaya Publication, Bombay.
3. "Research in Education", John W Best and V. Kahn, PHI Publication.
4. "Research Methodology- A step by step guide for beginners", Ranjit Kumar, Pearson
5. "Management Research Methodology-Integration of principles, methods and Techniques", K.N. Krishna swami and others, Pearson Education

Branch: MCA	Semester-V
Subject Code: 5103	Lecture: 04 Credit: 04
Subject Title	DISTRIBUTED COMPUTING

Modules	Sr. No	Topic	No. of Lectures required	Weightage in marks
UNIT-I	1	**Fundamentals:** What is a distributed computing system? Distributed computing systems models. Why are distributed computing systems gaining popularity, what is a distributed operating system? Issues in designing a distributed operating system. Introduction to distributed computing environment.	04	16
	2	**Computer Network :** Network types, LAN technologies, WAN technologies, Communication protocols, Internetworking, ATM technology.	04	
UNIT-II	3	**Message passing:** Desirable features of good message passing systems, Issues in IPC by message passing, Synchronization, Buffering, Multi diagram messages, Encoding and decoding of message data, Process addressing, Failure handling, Group communication.	06	12

	4	**Remote procedure call:** RPC model, Transparency of RPC, Implementing RPC mechanism, Stub generation, RPC messages, Server management, Communication protocols for RPC, Client-server binding, Security, Some special types of RPC (overview).		06	12
UNIT-III	5	**Distributed shared memory :** General architecture of DSM systems, Design and implementation issues of DSM, Granularity, Structure of shared-memory space, Consistency models, Advantages of DSM.		06	28
	6	**Synchronization :** Clock synchronization, Event ordering, mutual exclusion, Deadlock, Election algorithms.		08	
UNIT-IV	7	**Resource management :** Desirable features of a good global scheduling algorithm, Task assignment approach, Load balancing approach, Load sharing approach.		04	16
	8	**Process management :** Process migration, Threads		04	
	9	**Distributed file systems:** Desirable features of a good distributed file system, File models, File accessing models, File sharing semantics, File catching schemes, File replication, Fault tolerance.		04	16
	10	**Distributed databases :** Distributed data storage, Network transparency, Distributed query processing, Distributed transaction mode, Commit protocols, Coordinator control, Concurrency control, Dead lock handling, Multi database systems.		04	

Text Books:

1. Pradeep K. Sinha, Distributed operating systems: concepts and design, PHI, 2001. Silbersschatz, Henry Korth, Sudarshan, Database systems concept, 3rd edition McGraw Hill, 1996.

Reference Books

1. Elmasri/Navathe, Fundamentals of database systems, 2nd edition, Addision Wesley
2. C.J.Date, An introduction to database system, 6th edition, Addison Wesley George
3. Coalouns, Jean Doleemore, Tim Kindberg, Distributed systems concepts and design, Pearson education, 2001.

Branch: MCA	Semester-V
Subject Code: 5104	**Lecture: 04** **Credit: 04**
Subject Title	**DATA WAREHOUSING AND DATA MINING**

Modules	Sr No.	Topic Details	No. of Lectures Assigned	Marks Weight age
UNIT-I	1	**Data Warehousing:** **Overview And Concepts:** Need for data warehousing, Basic elements of data warehousing, Trends in data warehousing.	2	08
	2	**Planning And Requirements:** Project planning and management, Collecting the requirements.	2	
		Architecture And Infrastructure: Architectural components, Infrastructure and metadata.	4	16
	3	**Data Design And Data Representation:** Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.	4	
UNIT-II	4	**Information Access And Delivery:** Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web.	4	16
	5	**Implementation And Maintenance:** Physical design process, data warehouse deployment, growth and maintenance.	4	
	6	**Data Mining:** **Introduction:** Basics of data mining, related concepts, Data mining techniques.	4	16
	7	**Data Mining Algorithms:** Classification, Clustering, Association rules.	4	
UNIT-III	8	**Knowledge Discovery :** KDD Process **Web Mining:** Web Content Mining, Web Structure Mining, Web Usage mining.	6	24
	10	**Advanced Topics:** Spatial mining, Temporal mining. **Visualisation :** Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases	6	
UNIT-IV	11	**Data Mining Primitives, Languages, and System Architectures:** Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems	6	20
	12	**Application and Trends in Data Mining:** Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining	4	

Text Books:
1. Paulraj Ponnian, .*Data Warehousing Fundamentals*., John Wiley.
2. M.H. Dunham, .*Data Mining Introductory and Advanced Topics*., Pearson Education.
3. Han, Kamber, .*Data Mining Concepts and Techniques*., Morgan Kaufmann
4. Ralph Kimball, .*The Data Warehouse Lifecycle toolkit*., John Wiley.
5. M Berry and G. Linoff, .*Mastering Data Mining*., John Wiley.
6. W.H. Inmon, .*Building the Data Warehouses*., Wiley Dreamtech.
7. E.G. Mallach, .*Decision Support and Data Warehouse systems*., TMH.

Modules	Sr . No.	Topic Details	No. of Lectures Assigned	Marks Weight age
UNIT-I	1	**Fundamentals of GIS:** Defining GIS, components of GIS, spatial data, spatial data-maps, characteristics, spatial data modeling, attribute data management-database data model, GIS applications and developments in database.	8	16
UNIT-II	2	**Input-Output and Data Analysis in GIS:** Data input and editing– methods, editing, integration, Data analysis-measurements, queries, reclassification, buffering, map overlay, interpolation, analysis of surfaces, network analysis, spatial analysis, Analytical modeling in GIS - physical, environment and human processes, output from GIS –maps, non-cartographic output, spatial multimedia, decision support.	15	30
UNIT-III	3	**Issues in GIS:** Development of computer methods for spatial data, Issues in GIS–data quality and errors, sources of errors, human and organizational issues, GIS project design and management– problem identification, designing a data model, project management, Implementation, evaluation, the future of GIS, Internet resources of GIS.	15	30
UNIT-IV	4	**Remote Sensing:** Principles of remote sensing, remote sensing system-classification, Imaging, characteristics, extraction of information from images–metric and thematic, Integration of RS and GIS.	8	16
	5	**Global Positioning Systems (GPS):** Introduction to GPS, Accuracy of GPS, Differential GPS, Applications of GPS, Integration of GIS and GPS.	4	08

Reference Books :

1. An Introduction to Geographical Information Systems by Heywood, Cornelius and Carver (Person Education Asia 2000)
2. Concepts and techniques of Geographic Information Systems by C. P. Lo and Albert Yeung (PHI, New Delhi)
3. Fundamentals of Geographic information Systems 2nd Edition by Michael N. Demers (John Wiley & Sons (ASIA) Pte Ltd)
4. ArcGIS Developer's Guide for Visual Basic Applications by Razvi (Onword Press, 2002)

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age
UNIT-I	1	**Basic Concepts of Technology and Law:** Understanding the Technology of Internet, Scope of Cyber Laws, Cyber Jurisprudence.	4	08
	2	**Law of Digital Contracts :** The Essence of Digital Contracts, The System of Digital Signatures, The Role and Function of Certifying Authorities, The Science of Cryptography, Intellectual Property Issues in Cyber, Space: Copyright in the Digital Media, Patents in the Cyber World.	6	12
UNIT-II	3	**Rights of etizens and E-Governance:** Privacy and Freedom Issues in the Cyber World, E-Governance, Cyber Crimes and Cyber Laws, Ethical hacking. Information Technology Act 2000: Information Technology Act-2000- (Sec 1 to 94).	8	16
	4	**Cyber Law Issues for Management:** Cyber Law Issues in E-Business Management, Major issues in Cyber Evidence Management, Cyber Law Compliancy Audit.	6	12
UNIT-III	5	**INTELLECTUAL PROPERTY RIGHTS** **Basic Principles and Acquisition of Intellectual Property Rights:** Philosophical Aspects of Intellectual Property Laws, Basic Principles of Patent Law, Patent Application procedure, Drafting of a Patent Specification, Understanding Copyright Law, Basic Principles of Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property Information Technology Related Intellectual Property Rights.	10	20
UNIT-IV	6	• Computer Software and Intellectual Property-Objective, Copyright Protection, Reproducing, Defenses, Patent Protection. • Database and Data Protection-Objective, Need for Protection, UK Data Protection Act, 1998, US Safe Harbor Principle, Enforcement. • Protection of Semi-conductor Chips-Objectives, Justification of protection, Criteria, Subject-matter of Protection, WIPO Treaty, TRIPs, SCPA.	8	16
	7	• Domain Name Protection-Objectives, domain name and Intellectual Property, Registration of domain names, disputes under Intellectual Property Rights, Jurisdictional Issues, and International Perspective.	8	16

References:

1. How to Register Your Own Copyright by Marx Warda, Sphinx Publishing

2. Licensing Art & Design by Caryn R. Leland, Allworth Press
3. A Professional's Guide to Licensing and Royalty Agreements by Caryn R. Leland Allworth Press
4. IT2000 Bill
5. Web sites: online information, handouts

Branch: MCA	Semester-V
Subject Code: 5105	Lecture: 04 Credit: 04
Subject Title	Elective II SOFTWARE TESTING

Modules	Sr No.	Topic Details	No. of Lectures Assigned	Marks Weight age
UNIT-I	1	Software Testing Terminology and Methodology Software Testing Terminology, Software Testing Life Cycle, Writing a Policy for Software Testing, Economics of Testing, Testing – An organizational Issue, Management Support for Software Testing, Fig. of Software Testing Methodology, Risk associated with not meeting customer needs, Developing Test Strategy	4	14
	2	Overview of Software Testing Process Advantages of Following a Process, The Cost of Computer Testing, The Seven-Step Software Testing Process	3	
		Verification and Validation Verification and Validation (V&V) Activities, Verification, Verification of Requirements, Verification of High –level Design, Verification of Low –level Design, How to Verify Code? ,Validation	3	10
	3	Static Testing Inspections, Structured Walkthroughs, Technical Reviews	2	
UNIT-II	4	Validation Activities Unit Validation Testing, Integration Testing, Function Testing, System Testing , Acceptance Testing	3	06
	5	Regression Testing Progressive vs. Regressive Testing, Regression Testing Produces Quality Software, Regression Testability, Objectives of Regression Testing, When is Regression Testing Done? , Regression Testing Types, Defining Regression Test Problem, Regression Testing Techniques	6	12
UNIT-III	6	Test Management Test Organization, Structure of Testing Group, Test Planning, Detailed Test Design and Test Specifications	4	8
	7	Software Metrics Need for Software Management, Definition of Software Metrics, Classification of Software Metrics, Entities to be Measured, Size Metrics	4	8

Modules	Sr No.	Topic Details	No. of Lectures Assigned	Marks Weightage
UNIT-IV	8	Testing Metrics for Monitoring and Controlling the Testing Process Measurement Objectives for Testing, Attributes and Corresponding Metrics in Software Testing, Attributes, Estimation Models for Estimating Testing Efforts (include only topic Halstead Metrics), Test Point Analysis (TPA) – introduction only	5	10
	9	Testing Process Maturity Models Need for Test Process Maturity, Measurement and Improvement of a Test Process, Test Process Maturity Models	4	8
	10	Automation and Testing Tools Need for Automation, Categorization of Testing Tools, Selection of Testing Tools, Cost Incurred in Testing Tools, Guidelines for Automated Testing, Overview of Some Commercial Testing Tools Testing Object Oriented Software Object-Oriented Testing	6	12
	11	Using Agile Methods to Improve Software Testing The importance of Agility, Building an Agile Testing Process, Agility Inhibitors, Is Improvement Necessary, Compressing Time, Challenges, Solutions , Measuring Readiness , The Seven-Step Process 4.5 Test Plan	6	12

Text books:

1. Software Testing Principles and Practices - By Naresh Chauhan, Oxford
2. Effective Methods of Software Testing (3rd Edition) - By William E Perry Wiley, India
3. Software Testing principles and practices- By Srinivasan Desikan, Gopalaswamy Ramesh,Pearson Ed.
4. Software testing (2nd Edition) – By Ron Patton, Pearson Education
5. Effective Software Testing 50 specific ways to improve your testing- By Elfriede Dustin, Pearson Edu.

Branch: MCA	Semester-V
Subject Code: 5105	Lecture: 04 Credit: 04
Subject Title	Elective II DIGITAL IMAGE PROCESSING

Modules	Sr No.	Topic Details	No. of Lectures Assigned	Marks Weight age

UNIT-I	1	**Introduction:** Introduction to Digital Image Processing, Origins of DIP, Examples of fields that use DIP, Fundamental steps, Components of an IP System **DIP Fundamentals:** Elements of visual Perception, Image model, Sampling & quantization, some basic relationships between pixels, Linear and nonlinear operations.	04	24
	2	**Image Transforms** DFT, Walsh Transform, Hadamard Transform, Discrete Cosine Transform , K-L Transform, Harr Ttransform.	08	
UNIT-II	3	**Image Enhancement**: Enhancement in Spatial Domain **:** Some basic Gray Level Transformations, Histogram Processing, Enhancement using Arithmetic/Logic operations, Basics of Spatial Filtering, Smoothing Spatial Filtering, Sharpening Spatial Filtering. **Enhancement in Frequency Domain:** Smoothing frequency domain filters, Sharpening frequency domain filters and Homomorphic filtering.	10	20
UNIT-III	4	**Image Compression:** Introduction, redundancy, types of redundancies, Fidelity criterion, Image compression models- Source encoder and Source Decoder, Channel Encoder and Decoder. **i**) Lossless compression: Variable length coding, Bit plane coding, Lossless Predictive coding techniques. **ii**) Lossy Compression: Lossy coding, Transform coding.	10	20
UNIT-IV	5	**Image Segmentation:** Detection of discontinuities (Point, Line, Edge and Combined), Edge Linking and Boundary Detection, Thresholding, Region based segmentation.	08	26
	6	**Representation and Description:** Representation, Boundary descriptors, Regional descriptors.	05	
	7	**Morphological Image Processing:** Preliminaries, Dilation and Erosion, Opening and Closing, Hit-or-Miss Transform, Some basic Morphological algorithms.	05	10

Text Book:

1. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Second Edition, Pearson Education publication.

2. Anil K. Jain, "Fundamental of Image Processing", PHI publication

3. William Pratt, " Digital Image Processing:" John Wiley publication.

4. Awacock, "Applied Image processing:, TMH publication

5. N. Ahmed & K. R. Rao "Orthogonal transforms for Digital Signal Processing", (Springer Verlag).

Branch: MCA	Semester-V
Subject Code: 5105	Lecture: 04 Credit: 04
Subject Title	Elective II SOFTWARE PROJECT MANAGEMENT

Modules	Sr No.	Topic Details	No. of Lectures Assigned	Marks Weight age
UNIT-I	1	**Project Management Framework** Overview of project Management, Project Organization, Planning a s/w project, Project management life cycle, Risk management, Identification of Risks, Risk Analysis, Risk Planning & Monitoring	8	32
	2	**S/w Project Estimation:** Project Estimation , Different methods of estimation (COCOMO model, Delphi cost estimation etc.), Function point analysis	8	
UNIT-II	3	**Project Management Tools & Techniques** PERT & Gantt Charts, Introduction to Microsoft Project	8	32
	4	**Software Quality Management & Testing** Quality Assurance & Standards, Quality Planning, Quality control Role of testing in Software development , Testing Procedure, Defect Management	8	
UNIT-III	5	**Configuration Management(CM):** CM planning, Change Management, Version and Release Management, Configuration Management	8	32
UNIT-IV	6	**S/W Team Management:** Characteristics of Performance management, High performance Directive and collaborative styles, Team Structure, Team Communication, Managing customer expectations,Group Behavior Role of User in Projects,User role in project management,User role in various stages of,S/W Development User role in System ,implementation	10	20

Reference:
1. Software Project management By Edwin Bennatan
2. Software Engineering By Roger S. Pressman
3. Software Engineering concepts by Richard Fairley
4. Software Project Management by S.A. Kelkar
5. Software Engineering by IAN Sommerville
6. System Analysis and Design Methods By J.L Whitten , L.D.Bentley and K.C. Dittman

Branch: MCA	Semester-V
Subject Code: 5201	Practical: 02 Credit: 02
Subject Title	ADVANCED WEB TECHNOLOGY LAB

Modules	Sr. No:	Topics and Details	No.of Lectures/ Practicals assigned	Marks Weight age
UNIT-I	1	Introduction to Web Technology, HTML, Basic Tags, CSS, Table and Forms	1	02
	2	Introduction to JavaScript, Variables, Operators, Data Type Conversions, functions, Control Structure, Date Time functions and Form Manipulation	2	08
	3	MYSQL – Introduction about Database, Data Types, DML, DDL, Aggregate functions, Data Time functions, Stored Procedure, Sub query and join	2	
	4	PHP-Introduction to PHP, History, Web Brower, Web Server, Xampp, Installation and Configuration files.	2	08
	5	Syntax, Operators, Variables, Constants, Control, Structure, Language construct and functions	2	
UNIT-II	6	Function – Syntax, Arguments, Variables, References, Returns and Variable Scope	2	12
	7	Arrays-Enumerated Arrays, Associative array, array iteration, Multi-dimensional array, Array function and SPL Date and Time functions.	2	
	8	OOP's – Instantiation, Modifiers, Inheritance, Interfaces, Exceptions, Static Methods and Properties, Auto load, Reflection, Type Hinting and Class Constance.	2	
UNIT-III	9	String and Patterns- Quoting, Matching, Extracting, Searching, Replacing and Formatting	2	4
	10	Web Features- Sessions, Forms, GET and POST data, Cookies, HTTP Headers. Database Programming.	2	4
	11	Streams and Network Programming- Files, Reading , Writing, File System functions, Streams File Uploading and File Downloading.	2	4

Modules	Sr. No:	Topics and Details	No.of Lectures/ Practicals assigned	Marks Weight age
UNIT-IV	12	Ajax Basics, Sending data to PHP with Ajax, Prototype- Utility functions, Ajax object and Form Object. Smarty- variables, Variable Modifiers, Built-in Functions, custom functions, Config files.	2	4
	13	Introduction to Joomla	2	4
		CakePHP - MVC Overview, Naming Conversions, Model, V\view, Controller, Helpers, Scaffolding an Data Validation , Security , Web Services	1	2

Branch: MCA	Semester-IV
Subject Code: 5202	Practical: 02 Credit: 02
Subject Title	ADVANCED TECHNOLOGY LAB

Modules	Sr. No:	Topics and Details	No.of Lectures/ Practicals assigned	Marks Weight age
UNIT-I	1	**JAVA Concepts** OOPs Concepts, Inheritance in detail , Exception handling, Packages & interfaces, JVM & .jar file extension, Collections – HashTable,Vector,,List, ArrayList, HashMap, Multi threading (Thread class & Runnable Interface) **SQL:** DML & DDL Queries in brief	2	04
	2	**Introduction to Android** What is Android? Setting up development environment, Dalvik Virtual Machine & .apk file extension, Fundamentals : a) Basic Building blocks – Activities,Services,Broadcast Receivers & Content providers b) UI Components- Views & notifications c) Components for communication -Intents & Intent Filters, Android API levels(versions & version names)	3	10
UNIT-II	3	**Application Structure(in detail)** AndroidManifest.xml, • uses-permission & uses-sdk • Activity/services/receiver declarations, Resources & R.java, Assets, Values – strings.xml Layouts & Drawable Resources, Activities and Activity lifecycle, First sample Application Deploying sample application on a real device	2	
	4	**Emulator-Android Virtual Device:** Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to DDMS, File explorer,	4	14

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		Second App :- (switching between activities), Develop an app for demonstrating the communication between Intents **Basic UI design: ,**Form widgets, Text Fields, Layouts, • RelativeLayout ,TableLayout, FrameLayout, LinearLayout , Nested layouts, [dip,dp,sip,sp] versus px **Preferences,** SharedPreferences, Preferences from xml, Examples, **Menu** Option menu, Context menu, Sub menu, menu from xml, menu via code, Examples, **Intents (in detail),** Explicit Intents, Implicit intents, Examples, **UI design** Time and Date, Images and media, Composite, AlertDialogs & Toast, Popup, Examples , **Tabs and TabActivity,** Examples, **Styles & Themes,** styles.xml, colors.xml- declaring colors and drawables, Drawable resources for shapes, gradients(selectors), • Shapes drawables, • State drawables, Transition drawables, Patch drawables style attribute in layout file Applying themes via code and manifest file, Examples		
UNIT-III	5	**SQLite Programming:** SQLite Programming, SQLiteOpenHelper, SQLiteDatabse, Cursor Content providers, • Defining and using content providers, • Example- Sharing database among two different applications using content, providers, Reading and updating Contacts, Reading bookmarks, Example : - Develop an App to demonstrate database usage. CRUD operations must be, implemented. Final details should be viewed in GridView as well as in, ListView., Do the same application with database operations in a single class(As a Model class) and do the CRUD operations with this class object	3	
UNIT-IV	6	**Android Debug Bridge(adb) tool Linkify** Web URLs,Email address,text,map address,phone numbers, MatchFilter & , ransformFilter, Examples **Adapters and Widgtes:** Adapters :-, a) ArrayAdapters, b) BaseAdapters, Example - Efficient Adapter , ListView and ListActivity, Custom listview, GridView using adapters, Gallery using adapters ,Examples **Notifications: ,**Broadcast Receivers , Services and notifications, Toast, Alarms,Examples **Custom components :** Custom Toast, Custom dialogs, Custom Tabs, Custom animated popup , panels,Other components,Examples	5	22
	7	**Threads:** Threads running on UI thread(runOnUiThread), Worker thread, Handlers & Runnable, AsynTask(in detail), Examples	3	

| | 8 | **Advanced:** Live Folders, Using sdcards – Reading and writing, XML Parsing, JSON Parsing, Including external libraries in our application, Maps via intent and MapActivity, GPS,Location based Services, Accessing Phone services(Call,SMS,MMS), Network connectivity services, Sensors, Using Wifi & Bluetooth, Action bar tabs and custom views on Action bars, Introduction to fragments, A brief introduction to Ice Cream Sandwich. | 3 | |

Books:

1. Professional Android 2 Application Development Paperback, John Wiley & Sons, Inc. (10)
   Reto Meier

SEMESTER VI

2601. Seminar

Objectives:

To obtain expertise in a topic of interest to the students in Computer Science and Application, that must not have been a part of the curriculum.
To encourage independent study as well as to develop competence in giving lectures on specified topics.

2602. Project

Objective:
To give the first-hand experience of analysis, design, implementation and documentation of relevant projects. Analysis of the existing system, Investigating alternatives, Design of a computer-based system Documentation, User training.