



Shri Vaishnav Vidyapeeth Vishwavidyalaya

B. Tech., B. Tech. + M. Tech. and B. Tech. + MBA (Information Technology)

Choice Based Credit System (CBCS) 2018-19

SEMESTER IV

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
ML301		Environment and Energy Studies	3	-	-	3	60	20	20	-	-

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

The students will be able to:

1. To understand sources of information required for addressing environmental challenges.
2. To identify a suite of contemporary tools and techniques in environmental informatics.
3. To apply literacy, numeracy and critical thinking skills to environmental problem-solving.

Course Outcomes:

The students should be able to:

1. Apply the principles of ecology and environmental issues that apply to air, land and water issues on a global scale.
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community.

Syllabus:

UNIT I

Environmental Pollution and Control Technologies: Environmental Pollution & Control: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and industrial pollution, Ambient air quality standards. Water pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid Waste management composition and characteristics of e - Waste and its management. Pollution control technologies: Wastewater Treatment methods: Primary, Secondary and Tertiary.

UNIT II

Natural Resources: Classification of Resources: Living and Non - Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problem, Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable energy source, case studies.



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UNIT III

Ecosystems: Definition, Scope and Importance ecosystem. Classification, Structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Energy flow in the ecosystem, Biogeochemical cycles, Bioaccumulation, ecosystem value, devices and carrying capacity, Field visits.

UNIT IV

Biodiversity and its Conservation: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man/wildlife conflicts; Conservation of biodiversity: In-situ and Ex-situ conservation. National biodiversity act.

UNIT V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio- economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan(EMP).

TEXT BOOKS:

1. Agarwal, K.C.,(latest edition).**Environmental Biology**, Bikaner :Nidi Pub. Ltd.
2. Brunner R.C.(latest edition) **Hazardous Waste Incineration**, McGraw Hill Inc.
3. Clank R.S. ,(latest edition. **Marine Pollution**, Clarendon Press Oxford (TB).
4. De A.K(latest edition) **Environmental Chemistry**, Wiley Western Ltd.
5. ErachBharucha(2005).**Environmental Studies for Undergraduate Courses** by for University Grants Commission.

REFERENCES:

1. R. Rajagopalan(2006).**Environmental Studies**. Oxford University Press.
2. M. AnjiReddy(2006).**Textbook of Environmental Sciences and Technology**. BS Publication.
3. Richard T. Wright(2008).**Environmental Science: towards a sustainable future** PHL Learning Private Ltd. New Delhi.
4. Gilbert M. Masters and Wendell P. Ela.(2008).**Environmental Engineering and science**. PHI Learning Pvt Ltd.
5. Daniel B. Botkin& Edwards A. Keller(2008).**Environmental Science** Wiley INDIA edition.
6. AnubhaKaushik(2009).**Environmental Studies**. New age international publishers.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *
BTIT502	UG	Computer Networks	3	1	2	5	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

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COURSE OBJECTIVES

The student should be made to:

1. Understanding the fundamental concepts of computer networking.
2. Creating students interest in the basic taxonomy and terminology of the computer networking area.
3. Applying advanced networking concepts for student knowledge.
4. Creating the student for entry Advanced courses in computer networking.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Understanding basic computer network technology.
2. Understanding and explain Data Communications System and its components.
3. Evaluating the different types of network topologies and protocols.
4. Remembering the layers of the OSI model and TCP/IP.
5. Evaluating the different types of network devices and their functions within a network.

SYLLABUS

UNIT-I

Computer Network: Definitions, Goals, components, Architecture, Classifications & Types. Layered Architecture: Protocol hierarchy, Design Issues, Interfaces and Services, Connection Oriented & Connectionless Services, Service primitives, Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, TCP/IP model overview, Descriptions of various layers and its comparison with TCP/IP. Network standardization.

UNIT-II

Data Link Layer: Need, Services Provided, Framing, Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Bit oriented protocols: SDLC, HDLC, BISYNC, LAP and LAPB.

UNIT-III

MAC Sublayer: Overview of MAC Layer, MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), CSMA/CA, CSMA/CD Ethernet, token bus, token ring, (IEEE 802.3, IEEE 802.4, IEEE 802.5, IEEE 802.11 wireless Communication.

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UNIT-IV

Network Layer: Need, Services Provided, Design issues, Routing and congestion in network layer, wired & wireless routing protocol examples, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multi cast Routing. IP protocol, IP Addresses, subnetting, Comparative study of IPv4 & IPv6, Mobile IP.

UNIT-V

Transport Layer: Overview, Design Issues, UDP: Header Format, Per-Segment Checksum, Carrying Unicast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management. **Session layer:** Overview, Authentication, Session layer protocol. **Presentation layer:** Overview, Data conversion, Encryption and Decryption, Presentation layer protocol (LPP, Telnet, X.25 packet Assembler/Disassembler). **Application Layer:** Overview, WWW and HTTP, FTP, SSH.

TEXT BOOKS:

1. Andrew S Tanenbaum, Computer Networks, 6th Edition, Pearson Education, 2016.
2. Behrouz A.Forouzan, TCP/IP-Protocol suite, 4th edition, McGraw-Hill, 2010.
3. William Stallings, Data and Computer Communication, 10th edition Pearson, 2014.
4. Comer, Internet working with TCP/IP Volume one, Addison-Wesley, 2015.
5. W. Richard Stevens, TCP/IP Illustrated, Volume 1, 2nd Edition Addison-Wesley Professional Computing Series.

REFERENCES:

1. Kaveh Pahlavan, Prashant Krishnamurthy, Networking Fundamentals, Wiley Publication,2009.
2. Michael A. Gallo & William M. Hancock, Computer Communications & Networking Technologies, Cengagepearsen publications, 2001.
3. Dimitri Bertsekas, Robert Gallager, Data Networks, PHI Publication, Second Edition, 1992.
4. Uyles Black, Computer Networks, PHI Publication, Second Edition, 1993.

LIST OF EXPERIEMNTS:

1. Demonstrate Different Types of Network Equipment's.
2. Color coding standard of CAT 5, 6, 7 and crimping of cable in RJ-45.
3. LAN installations and Configurations.
4. Experiment with basic network command and Network configuration commands.
5. Examine network IP.
6. Write a program to implement various types of error correcting techniques.
7. Write a program to implement various types of farming methods.
8. Implement & simulate various types of routing algorithm.
9. Installation of ONE (Opportunistic Network Environment) Simulator for High Mobility Networks.
10. Simulate STOP AND WAIT Protocols on NS-2.
11. Simulate various Routing Protocol on NS-2.
12. Simulate various Network Topologies on NS-2.
13. Configuring routers, bridges and switches and gateway on NS-2.

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							THEORY			PRACTICAL	
							SEM University	Two Term Exam	s Assessm	SEM University	s Assessm
BTCS405		Data Base Management System	3	1	2	5	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

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COURSE OBJECTIVES:

The student will have ability to:

1. To understand the dissimilar issues concerned in the intend and implementation of a database system.
2. To learn the physical and logical database design, database modelling, relational, hierarchical, and network models
3. To understand and develop data manipulation language to query, modernize, and manage a database
4. To expand an understanding of necessary DBMS concepts such as: database security, integrity, concurrency,
5. To intend and build a straightforward database system and show competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. Evaluate business information problem and find the requirements of a problem in terms of data.
2. Understand the uses the database schema and need for normalization.
3. Design the database schema with the use of appropriate data types for storage of data in database.
4. Use different types of physical implementation of database
5. Use database for concurrent use.
6. Backup data from database.

SYLLABUS:

UNIT-I

Introduction: Concept & Overview of DBMS, Three Schema Architecture of DBMS, Database Approach v/s Traditional File Accessing Approach, Advantages of Database Systems, Data Models, Schema and Instances, Data Independence, Data Base Language and Interfaces, Overall Database Structure, Functions of DBA and Designer, Database Users.



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SEMESTER IV

Entity-Relationship Model: Basic concepts, Design Issues, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets and Extended E-R features. ER Diagram to Relational Table conversion.

UNIT-II

Relational Model: Structure of Relational Databases, Relational Algebra, Relational Calculus, Extended Relational Algebra Operations, Views, Modifications of the Database. Domains, Tuples, Attributes, Relations, Characteristics of Relations, Joins and its type. Keys, Key Attributes of Relation, Relational database, Schemas, Integrity Constraints. Referential Integrity, Intension and Extension.

UNIT-III

SQL and Integrity Constraints: Concept of DDL, DML and DCL. Basic Structure, Set operations, Aggregate Functions, Null Values, Domain Constraints, Referential Integrity Constraints, Assertions, Views, Nested Sub Queries, Database Security Application development using SQL, Stored Procedures and Triggers.

Relational Database Design: Functional Dependency, Different Anomalies in designing a Database. Normalization using Functional Dependencies, Decomposition, Boyce-Codd Normal Form, 3NF, Normalization using Multi-Valued Dependencies, 4NF, Join Dependency, 5NF.

UNIT-IV

Transaction and Concurrency Control: Physical Data Structures, Query Optimization: Join Algorithm, Statistics and Cost based Optimization. Transaction Processing, Concurrency Control and Recovery Management: Transaction Model properties, State Serializability, Lock base protocols, Two Phase Locking, Time Stamping Protocols for Concurrency Control, and Validation Based Protocol, Multiple Granularities, Granularity of Data Item. Multi version schemes, Recovery with Concurrent Transaction, Recovery technique based on Deferred Update and Immediate Update, Shadow Paging, Recovery in MultiDatabase System and Database Backup and Recovery from Catastrophic Failure

UNIT-V

File Organization and Index Structure: File & Record Concept, Placing file records on Disk, Fixed and Variable sized Records, Types of Single-Level Index (primary, secondary, clustering), Multilevel Indexes, Dynamic Multilevel Indexes using B tree and B+ tree . Mongo DB, No SQL types, Features and tools.

TEXT BOOKS:

1. Henry F. Korth and Silberschatz Abraham, "Database System Concepts", Mc.GrawHill, 6th Edition, 2015.
2. C J Date, "An Introduction to Database System", Pearson Educations, 8th Edition, 2004
3. Elmasri, Navathe, "Fundamentals of Database Systems", Pearson Educations 7th Edition, 2016.
4. Seema Kedar, Database Management System, Technical Publications, 2009.
5. Rajiv Chopra, Database Management System (DBMS) A Practical Approach. Kindle Edition, S Chand (December 1, 2010), 2017.

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REFERENCES:

1. R Elmasri and S Navathe “Fundamentals of Database Systems” 7thedition Publisher: Pearson 2017.
2. Abraham Silberschatz and S Sudarshan “Database System Concepts” 6th Edition McGraw-Hill Education – Europe 2013.
3. Raghu Ramakrishnan and Johannes Gehrke “Database Management Systems” McGraw-Hill Education, 2003.
4. Kahate, Atul “Introduction to Database Management Systems” Pearson Education India, 2006.

LIST OF EXPERIMENTS:

1. Design a Database and create required tables. For e.g. Bank, College Database.
2. Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables.
3. Write a SQL statement for table and record handling like implementing INSERT statement, Using SELECT and INSERT together, DELETE, UPDATE, TRUNCATE statements and DROP, ALTER statements.
4. Write the queries for Retrieving Data from a Database Using the WHERE clause , Using Logical Operators in the WHERE clause , Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING Clause, Using Aggregate Functions and Combining Tables Using JOINS.
5. Write the query for implementing the following functions: MAX (), MIN (), AVG (), COUNT () .
6. Write the query to implement the concept of Integrity constrains.
7. Write the query to create the views.
8. Perform the queries for triggers.
9. Perform the following operation for demonstrating the insertion , updating and deletion using the referential integrity constraints.
10. Write the query for creating the users and their role. Using GRANT and REVOKE operations.

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COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME												
			THEORY			PRACTICAL		Th	T	P	CK	ED	ITS		
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*								
BTCS504	T+P	Software Engineering & Project Management	60	20	20	30	20	3	1	2	5				

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

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COURSE OBJECTIVES

The student will have ability to:

1. Knowledge of basic software engineering methods and practices.
2. Define software requirements and requirement engineering.
3. Apply approaches for various design and their principle.
4. Explore testing in various domain.
5. Development of significant teamwork and project based experience.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Compare various software process models and identify where these models are applicable.
2. Define and analyze software project management, the framework and the dimensions of software project management.
3. Comprehend System modeling using UML.
4. Identify software testing strategies by using testing tools.
5. Analyze software risks and risk management strategies.

SYLLABUS

UNIT-I

Nature of Software: Software Engineering, Software Process, A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models- Waterfall Model, Incremental Models, Evolutionary Models, Concurrent Models, Specialized Process Model, Unified Process, Personal and Team process Models, Process technology, Agile development.

UNIT-II

Functional and Non-functional Requirements: Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented Software Development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability.



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SEMESTER IV

UNIT-III

The Software Design Process: Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics.

UNIT-IV

Software Testing Strategies-Approach: Issues, Validation Testing and Their Criteria, System Testing, Alpha-Beta Testing, System Testing, Debugging, Testing Conventional Applications, Testing object Oriented Applications, Testing Web Applications.

UNIT-V

Need and Types of Maintenance: Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance(SQA). Project Metrics.

Text Books:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Tata McGraw-Hill seventh edition, 2009.
2. Richard Fairley, "Software Engineering Concepts" –, Tata Mcgraw Hill, 2008.
3. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa Pub, 2005.
4. Richard H. Thayer, "Software Engineering & Project Managements", Willey India

Reference:

1. Bernd Bruegge, Allen H. Dutoit, "Object-Oriented Software Engineering" Using UML, Patterns, and Java, PEARSON Third Edition, 2017.
2. Waman S. Jawadekar, "Software Engineering", TMH
3. Ian Sommerville, "Software Engineering", Seventh Edition, Pearson Education Asia, 2007.
4. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning.

List of Practical:

Select a topic of the project, then make the report on following points

1. System Analysis
 - 1.1. Identification of Need
 - 1.2. Preliminary Investigation
2. Feasibility Study
 - 2.1. Technical Feasibility
 - 2.2. Economical Feasibility
 - 2.3. Operational Feasibility
3. Literature Survey
 - 3.1. Work done by other
 - 3.2. Benefits
 - 3.3. Proposed Solution

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- 3.4. Technology used
- 4. Software Engineering Approach
 - 4.1. Software Engineering paradigm Applied
 - 4.1.1. Description
 - 4.1.2. Advantage & Disadvantages
 - 4.1.3. Reasons for use
 - 4.2 Requirement Analysis
 - 4.2.1 Software Requirement Specification
 - 4.2.1.1 Glossary
 - 4.2.1.2 Supplementary Specifications
 - 4.2.1.3 Use Case Model
 - 4.2.1.4 Comparative analysis documents
 - 4.2.2 Conceptual Level Activity Diagram
 - 4.3 Planning Managerial Issues
 - 4.3.1 Planning Scope
 - 4.3.2 Project Resources
 - 4.3.3 Team Organization
 - 4.3.4 Project Scheduling
 - 4.3.5 Estimation
 - 4.3.6 Risk Analysis
 - 4.3.7 Security Plan
 - 4.4 Design
 - 4.4.1. Design Concept
 - 4.4.2. Design Technique
 - 4.4.3. Modeling
 - 4.4.3.1. ER Model
 - 4.4.3.2. DFD Model
 - 4.4.3.2.1. DFD Model Level-0 and 1
 - 4.4.3.2.2. DFD Model Level 2 and 3
 - 4.4.3.3. Data Dictionary
 - 4.4.3.4. Activity Diagram
 - 4.4.3.5. Software Architecture
 - 4.5 Implementation Phase
 - 4.5.1. Language Used Characteristics
 - 4.5.2. Coding
 - 4.6 Testing
 - 4.6.1. Testing Objectives
 - 4.6.2. Testing Methods & Strategies used along with test data and the error listed for each test case for each function provided by the system

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BTCS409		Advanced Java Programming	3	1	2	5	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

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COURSE OBJECTIVES

The student will have ability to:

1. Understand Event Handling.
2. Understand structured and unstructured queries
3. Design and develop Web applications
4. Designing Enterprise based applications by encapsulating an application's business logic.
5. Designing applications using pre-built frameworks.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Design full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings and JavaFX
2. Learn to access database through Java programs, using SQL and No-SQL
3. Create dynamic web pages, using Servlets and JSP
4. Make a reusable software component, using advanced Frameworks
5. Invoke the remote methods in an application using Remote Method Invocation (RMI)

SYLLABUS

UNIT-I

J2EE Event Handling & GUI Design

Event handling, AWT: Windows, Graphics, Text, AWT Controls, Layout Managers, and Menus, Images, GUI Programming with Swing, Exploring Swing, Swing Menu

UNIT-II

Java Servlet

Overview, Servlet Interface, Request, Servlet context, response, Session, Dispatching request, Web Application

UNIT-III

JDBC Standard Extension 2.0

Introduction to databases (SQL ,No - SQL) Connecting to Databases – JDBC principles –

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Databases access – Interacting – Database search – Database support in Web applications
MySQL , Model View Controller, JSP , HTML , CSS.

UNIT-IV

ORM and J2EE Frameworks:

Introduction to Frameworks:- Struts, Spring basics, Spring AOP , Introduction to JavaScript and JQuery

UNIT-V

Advance J2EE Topic:

JavaMail 1.2(Sending and Receiving Mail, Mail body design, different components), Java Messaging Service (JMS) 1.0.2 (Architecture, Programming Model, Connection, Session, Producer, Consumer), Java API for XML Parsing (JAXP) 1.1 (Introduction, Parsing and XML, when to use SAX)

TEXT BOOKS:

1. Arnold, Ken, James Gosling, and David Holmes. The Java programming language. Addison Wesley Professional, 2005.
2. Keogh, James. "The Complete Reference J2ME." published by McGrawHill OSBORNE Edition (2003)..
3. Allamaraju, Subrahmanyam, et al. "Professional Java Server Programming J2EE 1." (2001).
4. Deshmukh, Hanumant, and JigneshMalavia. SCWCD exam study kit: Java web component developer certification. Manning Publications Co., 2002.
5. Cay, Horstmann, and Cornell Gary. "Core Java 2, Volume II–Advanced Features." (2005).

REFERENCES:

1. Kito D. Mann, “Java Server Faces in Action”,2nd Edition, Dreamtech Press , 4 January 2005 .
2. Maydene Fisher, Jon Ellis, Jonathan Bruce, Addison Wesley, “JDBC™ API Tutorial and Reference” Third Edition, Addison Wesley, 11 June 2009).
3. GiulioZambon , “Beginning JSP, JSF and Tomcat”, 2nd Edition , Apress ,29 September 2012.
4. AnghelLeonard , “JSF2.0 CookBook” ,3rd Edition , PACKT publication ,2010.
5. Bryan Basham, Kathy Sierra & Bert Bates, “Head First Servlets and JSP” , 3rd Edition , O'Reilly Media,2012.

LIST OF EXPERIMENTS:

1. How to set up multiple panels, compound borders, combo boxes.
2. Write a Program to implement Event handling.
3. Write a Program to develop Java Servlet and use request and response
4. Write a Program which allows the user to enter data in a jsp form and display in webpage
5. Show basic JDBC operation
6. Create Servlet file which contains following function:
 - 1) Connect 2) Create Database 3) Create table 4) Insert records into respective table 5) Update records of particular table of database 6) Delete records from table 7) Delete table and also Database.
7. Write a program to demonstrate Spring.
8. Write a program to demonstrate Spring JDBC operation.
9. Write a program to demonstrate Java Mail functionalities.
10. Write to program to demonstrate JMS queues.

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B. Tech., B. Tech. + M. Tech. and B. Tech. + MBA (Information Technology)

Choice Based Credit System (CBCS) 2018-19

SEMESTER IV

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIT 406	UG	UNIX and Shell Programming Lab	0	0	2	1	-	-	-	-	50

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

1. To provide introduction to UNIX Operating System and its File System.
2. To gain an understanding of important aspects related to the SHELL and the process
3. To develop the ability to formulate regular expressions and use them for pattern matching.
4. To provide a comprehensive introduction to SHELL programming, services and utilities.
5. To develop the ability to perform different networking tasks.

COURSE OUTCOMES:

On completion of this course:

1. Describe the architecture and features of UNIX Operating System and distinguish it from other Operating System
2. Demonstrate UNIX commands for file handling and process control
3. Write Regular expressions for pattern matching and apply them to various filters for a specific task
4. Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem.
5. Diagnose network using different networking utilities of UNIX.

SYLLABUS:

UNIT I:

Introduction to UNIX - The UNIX Operating System, The UNIX Architecture, Features of UNIX, Internal and External Commands, Command Structure.

General purpose utilities: cal, date, echo, printf, bc, script, passwd, path, who, uname, tty, stty, pwd, cd, mkdir, rmdir, od.

UNIT II:

Handling Files and C Environment - The File System, cat, cp, rm, mv, more, file, ls, wc, pg, cmp, comm, diff, gzip, tar, zip, df, du, mount, umount, chmod, The vi editor, security by file Permissions. Networking commands: ping, telnet, ftp, finger, arp, rlogin.

The C compiler, vi editor, compiler options, and run the programs.

UNIT III:

Shell Basics - Types of shells, Shell Functionality, Work Environment, Writing script & executing basic script, Debugging script, Making interactive scripts, Variables (default



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variables), Mathematical expressions. Conditional statements: If-else-elif, Test command, Logical operators - AND, OR, NOT, Case –esac. Loops: While, For, Until, Break & continue.

UNIT IV:

Command Line Arguments & Regular Expression - Command line arguments: Positional parameters, Set & shift, IFS. Functions & file manipulations: Processing file line by line, Functions. Regular Expression & Filters: Regular expression, Grep, cut, sort commands, Grep patterns.

UNIT V:

SED and AWK - SED: Scripts, Operation, Addresses, commands, Applications, grep and sed. AWK: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

TEXT BOOKS:

1. Stephen Prata “Advanced UNIX: A Programming's Guide”, BPB Publications, 2017.
2. Maurice J. Bach “Design of UNIX O.S. “, PHI Learning, 2015.
3. Brian W. Kernighan & Robe Pike, “The UNIX Programming Environment”, PHI Learning, 2015.
4. Sumitabha Das: “YOUR UNIX – The Ultimate Guide”, Tata McGraw Hill, 23rdreprint, 2012.
5. Yashavant Kanetkar, “Unix Shell programming”, 1st Edition, BPB Publisher, 2010.

REFERENCES:

1. Behrouz A. Forouzan, Richard F. Gilbery, “Unix and Shell Programming”, 1st Edition, Cengage Learning India, 2003.
2. Graham Glass, King Ables, “Unix for programmers and users”, 3rd Edition, Pearson Education, 2009.
3. Sumitabha Das, “Unix Concepts and Applications”, 4th Edition. TMH, 2006.
4. N.B. Venkateswarlu, “Advanced Unix programming”, 2nd Edition, B S Publications, 2010.

LIST OF EXPERIMENTS:

1. Perform installation of UNIX/LINUX operating system.
2. Study of UNIX general purpose utility commands.
3. Execution of various file/directory handling commands.
4. Working with the vi editor: Creating and editing a text file with the vi text editor using the standard vi editor commands.
5. Write a shell script for calculator (to perform basic arithmetic and logical calculations).
6. Write a shell script sum.sh that takes an unspecified number of command line arguments (up to 9) of ints and finds their sum. Modify the code to add a number to the sum only if the number is greater than 10.
7. Write a shell script that will take an input file and remove identical lines (or duplicate lines from the file).
8. Write a shell script takes the name a path (eg: /afs/andrew/course/15/123/handin), and counts all the sub directories (recursively).

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9. Shell scripts to explore system variables such as PATH, HOME etc.
10. Write a shell script that takes a name of a folder as a command line argument, and produce a file that contains the names of all sub folders with size 0 (that is empty sub folders)
11. Execution of various system administrative commands.
12. Write awk script that uses all of its features.
13. Write a shell script to display list of users currently logged in.
14. Write a shell script to delete all the temporary files.
15. Write a shell script to search an element from an array using binary searching.
16. Write shell script to perform different string operations of arrays.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIT306		Mobile App Development Lab	-	-	2	1	-	-	-	-	50

Legends: L - Lecture T - Tutorial/Teacher Guided Student Activity P - Practical C - Credit

*Teacher Assessment shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES

The student will have ability to:

1. Describe those aspects of mobile programming that make it unique from programming for other platforms.
2. Critique mobile applications on their design pros and cons,
3. Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
4. Program mobile applications for the Android operating system that use basic and advanced phone features, and
5. Deploy applications to the Android marketplace for distribution.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Students will understand aspects of mobile.
2. Students will be able to develop rapid prototyping techniques to design and develop sophisticated mobile interfaces.
3. Students will be able to create Program mobile applications for the Android operating system that use basic and advanced phone features, and
4. Students will be able to build applications to the Android marketplace for distribution.

SYLLABUS

UNIT-I

Introduction to mobile Devices and Administrative, Mobile Devices vs. Desktop devices - ARM and Intel Architectures - Power Management - Screen Resolution - Touch interfaces - Application development - App Store, Google Play, Windows Store - Development Environments Introduction: XCode , Eclipse , PhoneGAP, etc - Native vs. web applications.

UNIT-II

Mobile OS Architectures: Comparing and Contrasting architectures of all three – Android, iOS and Windows - Underlying OS (Darwin vs. Linux vs. Win 8) - Kernel structure and native level programming - Runtime (Objective-C vs. Dalvik vs. WinRT) - Approaches to Power Management – Security.

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SEMESTER IV

UNIT-III

Introduction to Android Development Environment, Android/iOS/Win 8 Survival and basic apps, Mobile frameworks, Tools, Native Level Programming on Android Low-level programming on (jailbroken) iOS o Windows low level APIs. Study Different Open Source Frameworks, Tools And Basic Languages Used For Mobile Development

UNIT-IV

Intents and Service: Android ,Intents and Services , Characteristics of Mobile Applications, Successful Mobile Development, Storing and Retrieving Data, Synchronization and Replication of Mobile Dat, Android Storing and Retrieving Data ,Working with a Content Provider, Communications Via Network and the Web, State Machine, Correct Communications Model

UNIT-V

Android Networking and Web , Telephony, Wireless Connectivity and Mobile Apps, Notifications and Alarms, Memory Management, Graphics Performance and Multithreading, Graphics and UI Performance Android Graphics and Multimedia Mobile Agents , Location Mobility and Location Based Packaging and Deploying Performance Best Practices.

TEXT BOOKS:

1. John Horton, “Android Programming for Beginners: Build in-depth, full-featured Android apps starting from zero programming experience” 2nd Edition, Packt Publishing, October 31, 2018
2. Mike van Drongelen, Aravind Krishnaswamy, “Lean Mobile App Development” ,2nd edition, Packt Publishing, 28 Nov 2017
3. Chris Griffith , “Mobile App Development with Ionic”, Revised Edition, O'Reilly Media, August 2017
4. Rick Boyer , Kyle Mew, “Android Application Development Cookbook” 2nd Revised Edition, Packt Publishing, March 31, 2016
5. Christian Keur “iOS Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) ” 6 edition Big Nerd Ranch Guides Publishing 27 Dec. 2016

REFERENCES:

1. <http://www.tutorialspoint.com/android/>
2. <https://www.lynda.com/Mobile-Apps-training-tutorials>
3. https://www.tutorialspoint.com/ios/ios_objective_c.htm
4. <https://developer.android.com/training/basics/>

LIST OF EXPERIMENTS:

1. Study of difference open source mobile development tools.
2. Installation of eclipse and Android Studio.
3. Develop an application that uses GUI components, Font and Colors.
4. Develop an application that uses Layout Managers and event listeners.
5. Develop a native calculator application.
6. Develop an application that draws basic graphical primitives on the screen.
7. Develop an application that makes use of database.
8. Develop an application that makes use of RSS Feed.
9. Implement an application that implements Multi threading.

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10. Develop a native application that uses GPS location information.
11. Implement an application that writes data to the SD card.
12. Implement an application that creates an alert upon receiving a message.
13. Develop a mobile application that creates alarm clock.

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