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*
ML307		**Environmental Management and Sustainability**	4	-	-	4	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 create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Course Outcomes:
The students should be able to:
1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

Syllabus:

Unit I: Introduction to Environment Pollution and Control
1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

Unit II: Climate Change and Environmental Challenges
1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

Unit III: Environmental Management and Sustainable Development
1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)

3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management,Water Conservation, Energy Conservation)

Unit 1V: Environmental Acts
1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functlons of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981:Objectives, Definition of Pollution under this act, Powers and Functions of Böards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefts

Unit V:Role of Individuals, Corporate and Society
1. Environmental Values
2. Positlve and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute,Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal. Uttarakhand flash floods

TEXT BOOKS:
1. Rogers, P.P., Jalal, K.F. , Boyd, I.A.(Latest Edition) . An Introduction to Sustainable Development. Earthscan
2. Kalam, A.P.J. (Latest Edition) .Target 3 Billon: Innovative Solutions Towards Sustainable Development. Penguin Books
3. Kaushik , A. and Kaushik (Latest Edition).Perspectives in Environmeniaf Studies. New Delhi: New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). Environmental Studies. S.K. Kataria and Sons.New Delhi
5. Bharucha,E. (Latest Edition). Environmental Studies for Undergraduate Courses. New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). Environmental Science: towards a sustainable future .New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). Environmental Studies. New York: Oxford University Press.

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).**Enviromental 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).**EnviromentalStudies**. New age international publishers.

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*
BTIT502	-	Computer Networks	3	1	2	5	60	20	20	30	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.
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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.

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. Uyless 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.

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*
BTCS502	-	**Operating System**	2	1	2	4	60	20	20	30	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 student will have ability to:
1. To learn the fundamentals of Operating Systems.
2. To study the mechanisms of Operating System to handle processes and threads and their communication.
3. To gain knowledge of process management concepts that includes architecture, Mutual exclusion algorithms, deadlock detection and recovery algorithms.
4. To learn the mechanisms involved in memory management in Operating System.
5. To know the components and management aspects of disc scheduling.

COURSE OUTCOMES
Upon completion of the subject, students will be able to:
1. To describe the detail structure of Operating System.
2. To design and Implement Process management Techniques in Operating System.
3. To calculate CPU Scheduling criteria.
4. To understand The Memory Management of Operating System.
5. To elaborate Disc Scheduling.

SYLLABUS

UNIT–I
Introduction to Operating System: Introduction and Need of operating system, Layered Architecture/Logical Structure of Operating system, Type of OS(Multiprogramming , Time Sharing, Real Time ,Networked, Distributed, Clustered, Hand Held), Operating system as Resource Manager and Virtual Machine, OS Services, BIOS, System Calls/Monitor Calls, Firmware- BIOS, Boot Strap Loader.
Threads- processes versus threads, threading, concepts, models, kernel & user level threads, thread usage, benefits, multithreading models.

UNIT–II

Process Management: Process Model, Creation, Termination, States & Transitions, Hierarchy, Context Switching, Process Implementation, Process Control Block, Basic System calls- Linux & Windows.

Basic concepts, classification, CPU and I/O bound, CPU scheduler- short, medium, long-term, dispatcher, scheduling:- preemptive and non-preemptive, Static and Dynamic Priority Criteria/Goals/Performance Metrics, scheduling algorithms- FCFS, SJFS, shortest remaining time, Round robin, Priority scheduling, multilevel queue scheduling, multilevel feedback queue scheduling.

UNIT–III

Interprocess Communication- Introduction to Message Passing, Race Condition, Critical Section Problem, Peterson's Solution, Semaphore, Classical Problems of Synchronization Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem, Sleeping Barber Problem etc. **Deadlock-** System model, Resource types, Deadlock Problem, Deadlock Characterization, Methods for Deadlock Handling, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock Detection, Recovery from Deadlock.

UNIT–IV

Memory Management- concepts, functions, logical and physical address space, address binding, degree of multiprogramming, swapping, static & dynamic loading- creating a load module, loading, static & dynamic linking, shared libraries, memory allocation schemes- first fit, next fit, best fit, worst fit and quick fit. Free space management- bitmap, link list/free list.

Virtual Memory- concept, virtual address space, paging scheme, pure segmentation and segmentation with paging scheme hardware support and implementation details, memory fragmentation, demand paging ,working set model, page fault frequency, thrashing, page replacement algorithms- optimal, FIFO,LRU; Bleady's anomaly; TLB (translation look aside buffer).

UNIT–V

File Management- Concepts, Naming, Attributes, Operations, Types, Structure, File Organization & Access (Sequential, Direct ,Index Sequential) Methods, Memory Mapped Files, Directory Structures One Level, Two Level, Hierarchical/Tree, Acyclic Graph, General Graph, File System Mounting, File Sharing, Path Name, Directory Operations, Overview Of File System in Linux & Windows.

Input/output Subsystems- Concepts, Functions/Goals, Input/Output devices- Block And Character, Spooling, Disk Structure & Operation, Disk Attachment, Disk Storage Capacity, Disk Scheduling Algorithm- FCFS, SSTF, Scan Scheduling, C-Scan Schedule.

TEXT BOOKS:

1. Abraham Silberschatz,"Operating system concepts",10th Edition,John Willey & Sons. INC, 2018
2. Andrew S.Tannanbaum, "Modern operating system", 4th Edition,Pearson Education, 2014
3. Dhananjay M. Dhamdhere, "Operating Systems:A concept Based Approach", 3rd Edition TMH, 2017,
4. SibsankarHaldar, Alex AlagarsamyAravind,"Operating System", 8th Edition, Pearson Education India,, 2010

REFERENCES:

1. Achyut S Godbole,"Operating System",3rd TMH,2017.
2. William Stalling, "operating system" 8th, Pearson Education, ,2014.

3. Vijay Shukla, "Operating System", 3^{rd,} Kataria&Sons ,2013.
4. Singhal&Shivratri,"Advanced Concept in Operating Systems", 1^{st ,} TataMc-Graw Hill Education, edition 2017.

LIST OF EXPERIMENTS:

1. Implement and update the BIOS settings of your PC.
2. If there are 5 printers are connected in a system each process to print will take different time to complete, and CPU will give a fixed time to each process after that deadline next process will enter in CPU. If a problem not completed in a given slot then that process will be re-enter as per the FCFS, on rotation basis? Apply the scheduling on this?
3. Implement Non Preemptive Priority CPU Scheduling.
4. Implement Non Preemptive Shortest Job first CPU Scheduling.
5. If there are 5 different resources like 3 printer,2 scanner are connected to a system each taking different time to complete the task. Which scheduling is best and gives best performance of CPU?
6. Implement the scheduling for that where CPU give chance to complete those process first which comes first?
7. Implement Round-Robin CPU scheduling.
8. Write a program to implement Semaphore.
9. Find the solution for the situation where 5 faculties are sitting in a round table. There are 4 ball pens are placed on this table. At a time only one pen can be picked by one faculty to writing work. What will happen if all picked the pen for writing simultaneously?
10. Find the solution for dentist checkup clinic where only one chair and one dentist is available for treatment. And having n chairs to waiting for patient.
    ▪ If there is no patient, then the doctor sleeps in his own chair.
    ▪ When a patient arrives, he has to wake up the doctor.
    ▪ If there are many patients and the doctor is doing treatment of him, then the remaining patients either wait if there are empty chairs in the waiting room or they leave if no chairs are empty.
11. Write a program for Memory Management Algorithms e.g. First Fit, Best Fit, Worst Fit.
12. Demonstrate Virtual memory Techniques like, LRU, FIFO etc.
13. Implement Shortest Seek Time First Disk Scheduling Algorithm.
14. Implement Scan Scheduling Disk Scheduling Algorithm.
15. Implement Circular Scan Disk Scheduling Algorithm.
16. Implement Look Disk Scheduling Algorithm.

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*
BTCS411		**Data Base Management System**	3	0	2	4	60	20	20	30	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 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.

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. SeemaKedar, Database Management System, Technical Publications, 2009.
5. Rajiv Chopra,Database Management System (DBMS) A Practical Approach. Kindle Edition, S Chand (December 1, 2010), 2017.

REFERENCES:

1. R Elmasri and S Navathe "Fundamentals of Database Systems" 7[th]edition 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.

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*
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;
*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. 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 – 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.

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | THEORY | | | PRACTICAL | | |
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIT406	-	**Unix and Shell Programming 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 course content should be taught and implemented with the aim to develop required skills so that students are able to acquire following competency:
- Know the basics of UNIX operating system and shellprogramming.

COURSE OUTCOMES
- Work on any Unix platform withconfidence
- Write the code in C language on UNIXplatform.
- Write effective scripts for their day to dayjobs
- Understand and use most of the Unix features and commands

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 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 and Regular Expression
Command line arguments: Positional parameters, Set & shift, IFS. Functions & file manipulations:

Processing file line by line, Functions. Regular Expression & Filters: What is 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**.**

REFERENCE BOOKS:
1. Graham Glass, King Ables, "Unix for programmers and users", 3rd Edition, Pearson Education,2009.
2. N.B Venkateswarlu, "Advanced Unix programming", 2ndEdition, BS Publications, 2010.
3. YashwanthKanitkar,"Unix Shell programming", 1stEdition, BPB Publisher,2010.
4. Sumitabha Das, "Unix Concepts and Applications", 4thEdition. TMH,2006.
5. Behrouz A. Forouzan, Richard F. Gilbery, "Unix and shell Programming", 1stEdition, Cengage Learning India,2003**.**

LIST OF EXPERIMENTS:
1. Installation of Unix/Linux operatingsystem.
2. Study of Unix general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown)commands.
3. Study of vieditor.
4. Study of Bash shell, Bourne shell and C shell in Unix/Linux operatingsystem.
5. Write a C program to check whether the given string is palindrome or not using Command line substitution.
6. Write a C program to check the given integer is prime ornot.
7. Write a C program to check whether the given number is Avogadro number ornot.
8. Write a C program that accept two integers as its arguments and computes the value of first number raised to the power of secondnumber.
9. Write a shell script program to display list of user currently loggedin.
10. Write a shell script program to display "HELLOWORLD".
11. Write a shell script program to develop a scientificcalculator.
12. Write a shell Script program to check whether the given number is even orodd.
13. Shell script Program to search whether element is present is in the list ornot.
14. Shell script program to check whether given file is a directory ornot.
15. Shell script program to count number of files in aDirectory.
16. Shell script program to copy contents of one file toanother.
17. Create directory, write contents on that and Copy to a suitable location in your homedirectory.
18. Use a pipeline and command substitution to set the length of a line in file to avariable.
19. Write a program using sed command to print duplicated lines ofInput.
20. Write a grep/egrep script to find the number of words character, words and lines in afile.
21. Write an awk script to develop a Fibonacciseries.
22. Write an awk script to display the pattern of given string ornumber.
23. Write an egrep script to display list of files in the directory.

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*
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.

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 MultimediaMobile Agents , LocationMobility and Location Based Packaging and DeployingPerformance 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.

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.