TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology
Mohgaon, Wardha Road, Nagpur - 441 108

ACCREDITED WITH GRADE
A+
NAAC

DEPARTMENT OF INFORMATION TECHNOLOGY

Structure & Curriculum

From

Academic Year 2022-23

Vision of Institute

To emerge as a learning Center of Excellence in the National Ethos in domains of Science, Technology and Management.

Mission of Institute

- ➢ To strive for rearing standard and stature of the students by practicing high standards of professional ethics, transparency and accountability.
- ➢ To provide facilities and services to meet the challenges of Industry and Society.
- ➢ To facilitate socially responsive research, innovation and entrepreneurship.
- ➢ To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices.

Vision of the Department

To contribute in the enhancement of capabilities of youth to face Information Technology challenges, by empowering them with innovative ideas.

Mission of the Department

- To stimulate students to learn effectively and apply the knowledge in the field of Engineering and Technology.
- To undertake industry academic collaboration to enhance competency in graduates.
- To foster innovative ideas amongst students for becoming leaders.
- To create an environment of research culture.
- To impart social and ethical values for inculcating the culture of lifelong learning.

Program Education Objectives (PEO)

- Acquire fundamental knowledge of mathematics, science and engineering to analyze, design and implement solutions to the Information Technology problems
- Understand emerging concepts and trends in Information Technology.
- Apply IT tools to develop innovative computational systems.
- The students are encouraged to develop the habit of lifelong learning to face the challenges.
- The students will be embedded as a responsible individual having ethical and social values to lead the society and to nurture team spirit.

Tulsiramji Gaikwad-Patil College of Engineering & Technology, Nagpur

SCHEME OF INSTRUCTION & SYLLABI

Programme: Information Technology

Scheme of Instructions: Second Year B.Tech.in Information Technology

Semester – IV

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	CT-1	CT-2	TA/CA	ESE	TOTAL
1	BSC	BIT2401	Discrete Mathematics and Graph Theory	3	1	-	4	4	15	15	10	60	100
2	PCC	BIT2402	Operating System Concepts	3	-	-	3	3	15	15	10	60	100
3	PCC	BIT 2403	Database Management Systems	3	-	-	3	3	15	15	10	60	100
4	ESC	BIT2404	Competitive Programming with Java	2	-	-	2	2	15	15	10	60	100
5	PCC	BIT2405	Design & Analysis of Algorithms	3	-	-	3	3	15	15	10	60	100
6	PCC	BIT2406	Internet Programming	3	-	-	3	3	15	15	10	60	100
7	PCC	BIT2407	Internet Programming Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	BIT2408	Database Management Systems Lab	-	-	2	2	1	-	-	25	25	50
9	ESC	BIT2409	Competitive Programming Java Lab	-	-	2	2	1	-	-	25	25	50
10	MCC	BAU2404	Group Reading of Classics	2	-	-	2	Audit	-	-	-	-	-
			Total	20	01	06	27	21	90	90	135	435	750

L- Lecture   T-Tutorial   P-Practical
CT1- Class Test 1   TA/CA- Teacher Assessment/Continuous Assessment
CT2- Class Test 2   ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	--	04	03	14	--	--	--	Yes
Cumulative Sum	9	25	23	22	--	--	--	--

PROGRESSIVE TOTAL CREDITS : 58+21=79

Head of Dept. (Information Technology)
Tulsiramji Gaikwad-Patil College of
Engineering & Technology, Nagpur.

Dean Academics
Tulsiramji Gaikwad-Patil
College Of Engineering
and Technology, Nagpur

Vice Principal
Tulsiramji Gaikwad Patil
College Of Engineering &
Technology, Nagpur

Principal
Tulsiramji Gaikwad Patil College Of
Engineering and Technology, Nagpur

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Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2401	Discrete Mathematics and Graph Theory	3	1	-	4

Pre-Requisites: Mathematics – I, Mathematics – II

Course Contents

Unit I	**Sets:** Sets, Types & Operation on sets, Mathematical Induction. Review of Logical Operations, **Relations:** Ordered pairs and n-tuples, Product Sets and Partitions, Relations and Digraphs, Matrix of Relation, Paths in Relations and Digraphs, Properties of Relations, Equivalence Relations & Partitions, Compatible Relation, Composition of Relations, Transitive Closure of a relation, Partial order relation, Partially ordered set, Hasse Diagrams. **Functions:** Definition, Composition of functions, Types of Functions, Invertible Function, Permutation Function, Characteristics function of a set with Theorems
Unit II	**Combinatorics:** Rules of Sum and Product, Permutations, Combinations. Pigeonhole Principle, Recurrence Relation, Linear Recurrence Relations with Constant Coefficients, Total Solutions, Applications of Relations and Functions
Unit III	**Groups, Ring and lattices:** Algebraic Systems, Semi Groups, Groups, Monoid, Abelian Groups, subgroups, Isomorphism, Automorphisms and Homomorphism group, Rings, Integral Domain and Fields Lattices and Algebraic Systems, Principle of duality, Properties of Algebraic system defined by Lattices, Boolean Lattices.
Unit IV	**Fuzzy Set & Fuzzy Logic :**Fuzzy sets & systems, Crisp set, operations & combinations on Fuzzy set, Relation between Crisp and Fuzzy set, Fuzzy Relation, Overview of Fuzzy Logic & classical logic.
Unit V	**Graph Theory:** Basic concepts of graph theory, Digraphs, Basic definitions, Matrix representation of graphs, Subgraphs and quotient graphs, Isomorphic graphs, Paths and circuits, Reach ability and connectedness, Node base, Euler's path & Hamilton's path, Tree, Binary tree, Undirected tree, Spanning tree, Weighted graphs (Only definitions and examples), Minimal spanning tree by Prim's algorithm & Kruskal's algorithm, Representation of algebraic expressions by Venn diagram and binary tree.

Text Books

1	C. L. Liu and D. P. Mohapatra, "Elements of Discrete Mathematics", 4th Edition, McGraw-Hill
2	Kenneth H. Rosen, "Discrete Mathematics and its Applications", & 7th edition, McGraw-Hill
3	Bernard Kolman, Robert C. Busby, Sharon Cutler Ross, "Discrete mathematical structures", 6th edition, Prentice Hall of India

Reference Books

1	Edgar G. Goodaire, Michael M. Parmenter, "Discrete Mathematics with Graph Theory", 3rd Edition, Pearson Education
2	Tremblay J. S., "Discrete mathematical structures with application", 3rdEdition, Tata McGraw Hill

Useful Links

1	https://nptel.ac.in/courses/106/106/106106183/
2	https://nptel.ac.in/courses/111/107/111107058/

	Course Outcomes	CL	Class Sessions
	After the successful completion of this course students will be able to-		
BIT2401.1	Apply formal proof techniques & Analyze types of relations and functions to solve the problems.	3	9
BIT2401.2	Solve recurrence relations, generating functions and combinatorial problems.	3	9
BIT2401.3	Understand the concepts of Groups, Rings and Lattices	2	9
BIT2401.4	Interpret fuzzy set theory and uncertainty concepts	3	9
BIT2401.5	Analyze computational problems in graph theoretical framework.	4	9

3

Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2402	Operating System Concepts	3	-	-	3

Pre-Requisites: Basics of Programming.

Course Contents

Unit I	**Introduction:** What is Operating System(OS), structure of OS, history of OS, Types of OS: Time sharing, real-time, multi-process (Asynchronous & Synchronous), multiprogramming (loosely coupled, tightly coupled), Distributed, web-based, client-server, peer-to-peer, services of OS, user view & machine view of OS, System calls, Spooling and buffering. Case Studies: Android, Linux, Windows 8.
Unit II	**File Management:** File Concept, file attributes, file operations, file system structure, file system implementation, file access methods, Disk Scheduling Algorithms, File protection, free space management on disk. **Process Management:** Process concept, process scheduling, operations on process, inter process communication, communication between client-server, multithreaded model, process scheduling criteria, scheduling algorithm.
Unit III	**Memory Management:** Preliminaries, Bare machine, resident monitor, swapping, multiple partitions, paging, segmentations, combined systems. Virtual Memory: Overlays, demand-paging performance, of demand paging, page replacement, virtual memory concepts, page replacement algorithms. Allocation algorithm, thrashing.
Unit IV	**Process Synchronization:** Critical Section problem, semaphores, classic problems: Dining Philosopher problem, producer-consumer, reader-writers problem, bounded buffer problem, monitors, Atomic transaction, synchronization examples.
Unit V	**Deadlock and Protection:** System model, deadlock characterization, methods for handling deadlocks, prevention, detection, recovery, avoidance, Banker's Algorithm. Goal of protection, mechanism & policies, domain protection, access matrix, implementation of access matrix, dynamic protection structures, revocation, existing systems & language based protection, protection problem security.

Text Books

T.1	Operating System Principles, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Wiley India Pvt. Limited
T.2	Modern Operating Systems – A. S. Tanenbaum, Pearson Education
T.3	Operating System- A. S. Godbole, Tata McGraw Hill, third edition
T.4	Android application Development for Java Programmers by James c. Sheusi, CENGAGE Learning.

Reference Books

R.1	Operating Systems concepts and Design – Milan Milenkovic, Tata McGraw Hill

Useful Links

1	https://nptel.ac.in/courses/106/105/106105214/
2	https://nptel.ac.in/courses/106/106/106106144/
3	https://nptel.ac.in/courses/106/102/106102132/

	Course Outcomes	CL	Class Sessions
After the successful completion of this course students will be able to-			
BIT2402.1	Describe the general architecture of computers and compare differing structures and type of operating systems.	2	9
BIT2402.2	Conceptualize synchronization amongst components of a typical operating system.	3	9
BIT2402.3	Recognize the purpose of memory management and virtual memory concepts.	4	9
BIT2402.4	Compare OS components through instrumentation for performance analysis.	4	9
BIT2402.5	Understand the concepts of deadlock and protection.	2	9

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Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2403	Database Management Systems	3	-	-	3

Pre-Requisites: Data Structure

Course Contents

Unit I	**Introduction to Database Management Systems:** Significance and advantages, Types of Databases, Limitations of File processing system, the DBMS Environment, Data Abstraction, Data Independence, DBMS Architecture, Functions of DBMS,
Unit II	**Formal relational query languages:** Relational Algebra, Tuple Relational calculus, Domain Relational Calculus. **Relational Model:** Evolution of Data Models, Entity Relationship Model, Development of ER Diagrams, Extended Entity Relationship Model. Relational model: Logical View of Data, Keys, Integrity Rules, Relational set operators, Data Dictionary and System Catalog, Indexes, Codd's Relational Database Rules.
Unit III	**Normalization of Database Tables:** Need and Significance, the normal forms - 1NF, 2NF, 3NF, BCNF, 4NF, 5NF. **Indexing, Hashing and File organization:** Organization of records in files, Data dictionary storage, Basic concepts of indexing, Ordered indices, B+ Tree index files, B+ Tree indexing, B+ Tree Extensions, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.
Unit IV	**Integrity Constraints and Design:** Domain constraints, Referential integrity, Functional dependencies, Closure of set of functional dependencies, Pitfalls in relational database design, Decomposition, Desirable properties of decomposition.
Unit V	**SQL and Advanced SQL:** SQL Data Definition, Basic Structure of SQL Queries, Set Operations, Null values, Aggregate functions, Nested Sub-queries, Modifications of the Databases Intermediate SQL: Join Expressions, Views, Integrity Constraints, SQL Data types and Schemas, Authorization. Advanced SQL: Dynamic SQL and Embedded SQL, Functions and Procedures, Triggers.

Text Books

T.1	Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database SystemConcepts, 6th Edition, McGraw Hill (SIE), 2013.
T.2	Carlos Coronel, Steven Morris and Peter Rob, Database Principles – Fundamentals of Design, Implementation and Management, 9th Edition, Cengage Learning,2013.
T.3	Hector-Garcia Molina, Jeffrey Ullman and JenifferWidom, Database Systems – theComplete Book, 2nd Edition, Pearson Education, 2014.

Reference Books

R.1	Alexis Leon and Mathews Leon, Database Management Systems, Vikas Publishing, 2008.
R.2	Ramez Elmasri and Shamkant Navathe, Database Systems - Models, Languages, Design and Application Programming, 6th Edition, Pearson Education, 2009.
R.3	An Introduction to Database Systems(8e Pearson) by Date, Kannan,Swamynathan

Useful Links

			Class	Lab
1	https://nptel.ac.in/courses/106/105/106105175/			
2	https://onlinecourses.nptel.ac.in/noc21_cs04/preview			
3	https://nptel.ac.in/noc/courses/noc18/SEM1/noc18-cs15/			

	Course Outcomes	**CL**	**Class Sessions**	**Lab Sessions**
After the successful completion of this course students will be able to-				
BIT2403.1	Describe the fundamental elements of relational database management systems	2	9	4
BIT2403.2	Recognize database storage structures, access techniques: file and page organizations, indexing methods including B tree, and hashing.	2	9	4
BIT2403.3	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data	3	9	4
BIT2403.4	Understand Query Processing and Query Optimization & to familiarize issues of concurrency control and transaction management	2	9	4
BIT2403.5	Design a commercial relational database system (Oracle, MySQL) by writing SQL.	4	9	4

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Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2404	Competitive Programming with Java	3	-	-	3

Pre-Requisites: C Programming, OOPs.

Course Contents

Unit I	**Fundamentals of Java:** Features of Java, Java Technology(JDK, JRE, JVM, JIT) , Java virtual machine, Reflection byte codes, Byte code interpretation, **Data types:** Primitive Data Types : Integers, Floating Point type, Characters, Booleans, User Defined Data Types, variable, **Operators:** Logical operators, Bitwise operators, Relational operators, Arithmetic operators, **Control Structures:** Working with control structure, Types of Control Structures, Decision Control Structure(if, if-else, if-else-if, switch-case), Repetition Control Structure(do-while, while, for), Objects and classes.
Unit II	**Array in Java:** Introduction, Array types, Array variables, declaration, creating array object, accessing array element, changing array elements, multidimensional array. **Packages:** Built-in Packages (java.awt, java.io, java.lang, java.math, java.sql, java.util), Creating User Defined Packages, Accessing a Package, Using a Package **Interfaces:** Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables.
Unit III	**Exception Handling:** Types of errors, exceptions, try-catch statement, multiple catch blocks, throw and throws keywords, finally clause, uses of exceptions, user defined exceptions **Multithreaded Programming:** Creating thread, extending Thread class, implementing Runnable interface, life cycle of a thread, Thread priority & thread synchronization, exception handing in threads
Unit IV	**Inheritance:** Basics of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical and hybrid inheritance, concepts of method overriding, extending class, super class, subclass. **String in Java:** Date, Date Time, Calendar Class: Converting Date to String and String to Date using simple date format class.
Unit V	**Java Database Connectivity Architecture:** Introduction to JDBC, Java and JDBC, JDBC VS ODBC, JDBC DRIVER MODEL, JDBC Driver Types, Two-tier Architecture for Data Access, Three-tier Architecture for Data Access, SQL CONFORMANCE, Types of Driver Managers. **Database Connectivity:** Introduction, A connection can be open with the help of following steps, Connecting to an ODBC Data Source

Text Books

T.1	Herbert Schildt, "Java The Complete Reference", 8th Edition, Tata McGraw-Hill Osborne Media, 2011.
T.2	E Balagurusamy , "Programming with Java", Tata McGraw-Hill

Reference Books

R.1	Cay S. Horstmann and Gary Cornell, "Core Java™, Volume I – Fundamentals" 8th Ed., Prentice Hall, 2007.

Useful Links

1	https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs08/
2	https://nptel.ac.in/courses/106/105/106105191/

	Course Outcomes	CL	Class Sessions	Lab Sessions
	After the successful completion of this course students will be able to-			
BIT2404.1	Analyze the concepts and use the syntax and semantics, data types, operators and control statements of java programming language.	4	9	4
BIT2404.2	Design and develop reusable java programs using the concepts of array, interfaces and packages.	5	9	4
BIT2404.3	Design the concepts of Multithreading and Exception handling to develop efficient and error free codes.	5	9	4
BIT2404.4	Illustrate concepts of inheritance to create new classes from existing one.	3	9	4
BIT2404.5	Demonstrate the skills to enables Java applications to interact with different types of database through database connectivity.	2	9	4

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Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2405	Design and Analysis of Algorithms	3	-	-	3

Pre-Requisites: Data Structures, Programming logic

Course Contents

Unit I	**ANALYSING ALGORITHMS** The Role of Algorithms in Computing - Growth of Functions – Recurrences - The Substitution Method - The Recurrence Tree Method - The Master Method - Probabilistic Analysis and Randomized Algorithms – Amortized Analysis – Aggregate Analysis – Accounting Method
Unit II	**DIVIDE AND CONQUER & GREEDY DESIGN STRATEGIES** Analysis of Quick Sort, Merge Sort – Quick Sort Randomized Version – Sorting in Linear Time- Lower Bounds for Sorting - Selection in Expected Linear Time - Selection in Worst case Linear Time – Greedy Algorithms - Elements of Greedy Strategy - Huffman Code, Dijkstra's Shortest Path Algorithm.
Unit III	**DYNAMIC PROGRAMMING AND OTHER DESIGN STRATEGIES** Dynamic Programming – Matrix Chain Multiplication - Elements of Dynamic programming – Longest Common Sequences – Warshall's and Floyds Algorithm – Transitive Closure - All Pairs Shortest Path Algorithm – Analysis – Backtracking – Graph Coloring Problem - Branch and Bound Strategy - Knapsack Problem.
Unit IV	**FLOW NETWORKS AND STRING MATCHING** Flow Networks – Ford Fulkerson Method - String Matching - Naive String Matching Algorithm– Knuth Morris Pratt Algorithm - Analysis.
Unit V	**NP PROBLEMS** NP-Completeness – Polynomial Time Verification – Theory of Reducibility - Circuit Satisfiability – NP - Completeness Proofs – NP Complete Problems: Vertex Cover, Hamiltonian Cycle and Traveling Salesman Problems – Approximation Algorithms– Approximation Algorithms to Vertex - Cover and Traveling Salesman Problems

Text Books

1	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Cliford Stein, "Introduction to Algorithms", Third Edition, Prentice Hall, 2010. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Second Edition, Universities Press, 2008.

Reference Books

1	Edgar G. Goodaire, Michael M. Parmenter, "Discrete Mathematics with Graph Theory", 3rd Edition, Pearson Education
2	Alfred V Aho, John E Hopcroft and Jeffrey D Ullman, "The Design and Analysis of Computer Algorithms", First Edition, Pearson Education, 2006.

	Course Outcomes	CL	Class Sessions
	After the successful completion of this course students will be able to-		
IT2405.1	Analyze any given algorithm and express its complexity in asymptotic notation	3	9
IT2405.2	Propose appropriate algorithmic strategy for any given problem	4	9
IT2405.3	Design algorithms based on strategy to solve problem base on time and space efficiency.	5	9
IT2405.4	Classify algorithms as deterministic polynomial time and non-deterministic polynomial time	2	9
IT2405.5	Analyse optimal algorithms for deterministic polynomial time problems and approximate algorithms for Non-deterministic polynomial time problems	4	9

Program: B.Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2406	Internet Programming	3	-	-	3

Pre-Requisites: - Competitive Programming

Course Objectives:

	Course Contents
Unit I	HTML and common tags: Introduction, www, Internet, URL, Common tags: Text formatting tags Line and Paragraph tags, Lists: ordered list Unordered List, definition List, anchor tag , Absolute and relative path, Tables and its attributes, Image tag-alt attribute, image mapping frames, forms , cascading style sheet, External style sheet, internal Style sheet.
Unit II	Java Scripts: Introduction Benefits of java script, Editing java scripts Displaying information, Alerls(), Promots(), confirm box, Operators, conditional statements, conditional loops, functions, arrays, Objects-math, string, date, Boolean, number, document, windows. DHTML with java script, Object model collection, events in java script, filters and transitions-Flip filter, Image mask, shadow filter, alpha filter, Blur filter. Difference between HTML and DHTML
Unit III	XML: Introduction, Advantages, Difference between HTML and XML, XML Namespace, Well formed and valid XML, XML Document type definition, XML schemas, Data types Attribute Types, XML Transformation-xsl, Document object model (DOM)using XML processors: DOM and SAX.
Unit IV	The Server Side: Client side Vs. Server side, Transformation from static to dynamic sites, Java Servlets, reading environment parameters, accessing parameterdata, state management, event driven tracking. An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions- Form Validation- Regular Expressions – File handling – Cookies – Connecting to Database
Unit V	Java Server Pages: Need of JSP, JSP Life Cycle, Elements in JSP Page, Implicit JSP Objects, JSP Objects scope, JSP tags, JSP exceptions ,Expression Language, JSP standard tag Library custom tag Library, JSP and Equivalent Technologies.

Text Books

T.1	Web Technology Theory and Practices by M. Shrinivasan, PEARSON publication. 2. Android application Development for Java Programmers by James c. Sheusi, CENGAGE Learning.
T.2	Web Technology Theory and Practices by M. Shrinivasan, PEARSON publication. 2. Android application Development for Java Programmers by James c. Sheusi, CENGAGE Learning.

Reference Books

R.1	HTML: The Complete Reference, by Thomas A. Powell, McGraw Hill 2. XML: The Complete Reference, by Williamson, McGraw Hill
R.2	HTML: The Complete Reference, by Thomas A. Powell, McGraw Hill 2. XML: The Complete Reference, by Williamson, McGraw Hill

Useful Links	
1	https://nptel.ac.in/courses/106/105/106105084/
2	https://nptel.ac.in/courses/106/105/106105183/

	Course Outcomes	CL	Class Sessions	Lab Sessions
After the successful completion of this course students will be able to-				
BIT3606.1	Understand the basic concepts of Internet programming and protocols used to create applications using HTML and CSS	2	9	4
BIT3606.2	Build dynamic web page with validation using Java Script objects	5	9	4
BIT3606.3	Create XML documents and Schemas.	6	9	4
BIT3606.4	Prepare applications using SERVLETS.	3	9	4
BIT3606.5	Demonstrate the JSP Life Cycle along with its tags.	4	9	4

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Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2407	Internet Programming Lab	-	-	2	1

Pre-Requisites: Operating System and Basic Computer Knowledge

Course Contents

Sr. No	List of Experiment
1	Create a web page with the following using HTML i) To embed an image map in a web page ii) To fix the hot spots iii) Show all the related information when the hot spots are clicked.
2	Create a web page with all types of Cascading style sheets. 3. Client Side Scripts for Validating Web Form Controls using DHTML
3	Write programs in Java to create applets incorporating the following features
4	Create a color palette with matrix of buttons Set background and foreground of the control text area by selecting a color from color palette. In order to select Foreground or background use check box control as radio buttons To set background images
5	Write programs in Java using Servlets: To invoke servlets from HTML forms to invoke servlets from Applets
6	Write programs in Java to create three-tier applications using JSP and Databases for conducting on-line examination for displaying student mark list. Assume that student information is available in database which has been stored in a database server.
7	Create web page using CSS
8	To write a program, which takes user id as input and displays the user details by taking the user information from the XML document.
9	Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.
10	Write an XML file which will display the Book information which includes the following: 1) Title of the book 2) Author Name 3) ISBN number 4) Publisher name 5) Edition 6) Price Write a Document Type Definition (DTD) to validate the above XML file. Write an XML file which will display the Book information which includes the following: 1) Title of the book 2) Author Name 3) ISBN number 4) Publisher name 5) Edition 6) Price Write a Document Type Definition (DTD) to validate the above XML file.

Text Books	
T.1	The Complete Reference HTML and XHTML by Thomas A.Powell, McGraw Hill Pub
T.2	Learning angular JS by Dayley, Brad Dayley

Reference Books	
R.1	Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic
R.2	Websites by Robin Nixon

	Course Outcomes	**CL**	**Class Sessions**	**Lab Sessions**
BIT2407:1	Execute program using concept of form validation, JavaScript and image mapping.	3	-	4
BIT2407:2	Demonstrate client side scripts using various style sheet and DHTML	3	-	4
BIT2407:3	Create applets program using java scripts concept	4	-	4
BIT2407:4	Design application and understand concept of servlet	4	-	4
BIT2407:5	Understand concept of HTML and JavaScript.	2	-	4

Program: B. Tech Information Technology

Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2408	Database Management Systems Lab	-	-	02	1

Pre-Requisites: Data Structure

S. No.	List of Experiments
1	To study and execute the DDL commands.
2	To study and implement different functions on a database.
3	To study and execute Primary key, foreign key concept.
4	To implement set operators and views on a database.
5	To perform queries based on Group By, Having, Order By clause.
6	To implement joins in Oracle.
7	To study the various data language commands (DCL) and implements them on the database.
8	To perform nested Queries and joining Queries using DML command.
9	To create and manipulate various database objects of the Table using views.
10	To create PL/SQL programs to implement various types of control structure.

Text Books

T.1	Hector-Garcia Molina, Jeffrey Ullman and Jeniffer Widom, Database Systems – the Complete Book, 2nd Edition, Pearson Education, 2014.
T.2	An Introduction to Database Systems(8e Pearson) by Date, Kannan, Swamynathan

Reference Books

R.1	Ramez Elmasri and Shamkant Navathe, Database Systems - Models, Languages, Design and Application Programming, 6th Edition, Pearson Education, 2009.
R.2	Alexis Leon and Mathews Leon, Database Management Systems, Vikas Publishing, 2008.

Useful Links

1	https://nptel.ac.in/courses/106/105/106105175/
2	https://onlinecourses.nptel.ac.in/noc21_cs04/preview

	Course Outcomes	CL	Class Sessions	Lab Session
BIT2408:1	Demonstrate the basic elements of a relational database management system.	3	-	4
BIT2408:2	Develop program using Primary and foreign key concept.	4	-	4
BIT2408:3	Identify the basic concepts and data model used in database design ER modelling concepts and architecture use and design queries using SQL	2	-	4
BIT2408:4	Apply the concept of transaction, concurrency control and recovery in database.	3	-	4
BIT2408:5	Apply relational database theory and show relational algebra expression, tuple and domain relation expression for queries.	3	-	4

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11Semester	Course Code	Name of Course	L	T	P	Credits
IV	BIT2409	Competitive Programming with Java	-	-	2	1

Pre-Requisites: C Programming, OOPs.
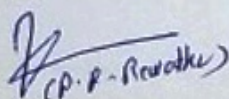
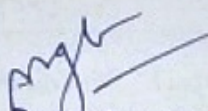| Sr. No	List of Experiment
1	Write an application program which display total marks of 5 students using student class with following attributes : RegNo(Int),Name (String),Marks in subject (Integer Array ,Total(Int)
2	Write a menu based java that accepts a shopping list of 4 items from command line and store in vector and perform operation .
3	Write an application program to create a player class and inherit three classes Cricket_player Football_player Hockey_player.
4	Write an application program to show how a class implements two interfaces.
5	Write an application program to implement the concept of Exception Handling.
6	A.Write an application program to implement the concept of threading by extending Thread class. B. Write an application program to implement the concept of threading by implementing Runnable Interface .
7	Write a java program to copy the content of one file into another file and store it into another file using I/O Stream.
8	A.Write an application program to demonstrate various methods in String class. B. Write an application program to demonstrate various methods in StringBuffer class.
9	Write a java application program using JDBC connectivity.
10	Java Program to Design Login Window Using AWT Controls (Button, Label,Textfield)
11	Write a Java program for building an GUI Application Using Swing Controls.
12	Write an applet program for creating a simple calculator to perform addition, Substraction ,multiplication and division using Button,Lebel and Textfield component.

Text Books

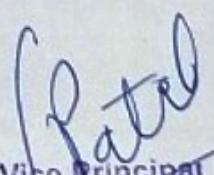|	
T.1	Herbert Schildt, "Java The Complete Reference", 8th Edition, McGraw-Hill Osborne Media, 2011.
T.2	Paul Deitel, "Internet & World Wide Web: How to Program", Prentice Hall, 4th Edition, 2007

Reference Books	
R.1	Cay S. Horstmann and Gary Cornell, "Core Java™, Volume I – Fundamentals" 8th Edition, Prentice Hall, 2007.
Useful Links	
1	https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs08/
2	https://nptel.ac.in/courses/106/105/106105191/

	Course Outcomes	CL	Lab Sessions
	After the successful completion of this course students will be able to-		
BIT2404.1	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP like encapsulation, Inheritance and Polymorphism	4	4
BIT2404.2	Design java programs and interpret object oriented data and report results.	5	4
BIT2404.3	Design an object oriented system, AWT components and multithreaded processes as per needs and specifications	5	4
BIT2404.4	Illustrate Types of servers and Configuring Using Web servers.	3	4
BIT2404.5	Demonstrate the concept of event handling used in GUI Programming for the Mobile web.	2	4

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