

GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc.(CA & IT)				Branch/Spec.	DCS			
Semester	III				Version	1.0.0.0			
Effective from Academic Year		2018-19			Effective for the batch Admitted in			June 2016	
Subject code	U13A1DS		Subject Name		DATA STRUCTURE				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	2	-	5	Theory	40	60	100
Hours	3	-	4	-	7	Practical	20	30	50
Pre-requisites:									
Basic knowledge of C, C++ languages and Familiarity with recursion									
Learning Outcome:									
By the end of this module students should be able to									
<ul style="list-style-type: none"> • Describe the usage of various data structures. • Explain the operations for maintaining common data structures. • Recognize the associated algorithms' operations and complexity. • Develop computer programs to implement different data structures and related algorithms. 									
Theory syllabus									
Unit	Content								Hrs
1	Overview of Data Structure: Introduction to data structure, Classification of Data Structure – Primitive data Structure, Non Primitive Data Structure, Linear Data Structure, Non Linear Data Structure								03
2	Linear Data Structures: Introduction to Stack, Operations of Stack, Applications of Stack – Polish Notation (Prefix, Infix, Postfix), Recursion, Stack Machine, Introduction to Queue, Simple Queue, Circular Queue, Double Ended Queue, Priority Queue, Applications of Queue, Introduction to LinkedList, Singly Linked List, Doubly Linked List, Circular Linked List, Doubly Circular LinkedList, Reverse a List, Merge a List, Multilinked Structures, Applications of Linked List.								20
3	Non Linear Data Structures: Terminologies of Tree, General Tree, Binary Tree and its Representation, Binary Search Tree, Operations of Binary Search Tree – Insert, Delete, Search, Traversal – PreOrder, InOrder, PostOrder, Threaded Tree (Excluding Algorithms), B Tree and B+ Tree (Excluding Algorithms), Height Balanced Tree (AVL) (Excluding Algorithms), Weight Balanced Tree(Excluding Algorithms), Terminologies of Graph, Representation of Graph, Graph Traversal Algorithms – BFS, DFS.								10
4	Searching Techniques: Introduction, Types of Searching – Sequential Search, Binary Search.								04

5	Sorting Techniques: Introduction, Types of Sorting – Selection, Bubble, Insertion, Shell, Quick.	08
Practical content		
List of programs specify by subject teacher based on above mention topics.		
Text Books		
	-	
Reference Books		
1	An Introduction to Data Structure with Applications by Tremblay J. and Sorenson.	
2	Publisher- Tata McGraw-Hill international Edition, 1087.	
3	Expert Data Structures with C by R.B.Patel.	
4	Classic Data Structures by DebasisSamanta, PHI Publications.	
5	Data Management and File Structures By Mary E. S. Loomis-PHI Publications.	
6	Data Structure Using C & C++ By Langsam, Yedidyah and Augenstein-PHI Publication.	

Note:

Version 2.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)

L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work

CE= Continuous Evaluation, SEE= Semester End Examination

Note for Examiner

Q-1 must be common from any topics from syllabus.

Q-2 and onwards must be from specific topics and internal choice or option can be given

Paper Structure

SECTION-I

Q-1 Attempt any Five Out of Seven: each question must be 6 marks) --- 30 marks

Question must be covered all possible section.

SECTION-II

Q-2 (Must be from topics: 1 and 2 (6+6))

Q-3 (Must be from topics: 3 and 4(6+6))

Q-4 (Must be from topics: 5(6))



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Programme	B.Sc.(CA&IT)				Branch/Spec.	Computer Applications			
Semester	III				Version	1.0.0.1			
Effective from Academic Year	2019-20				Effective for the batch Admitted in	June 2018			
Subject Code	U13A2OCP		Subject Name		OBJECT ORIENTED CONCEPTS AND PROGRAMMING				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3		2	-	5	Theory	40	60	100
Hours	3		4	-	7	Practical	20	30	50
Objective:									
To understand the basics of Object Oriented Programming language along with classes, methods, various class libraries, iterative execution, OOPs Concepts and packages.									
Pre-requisites:									
One should have knowledge of Computer, Basic Programming Language and Object Oriented Design.									
Learning Outcome:									
After completing this course, students should be able to:									
<ul style="list-style-type: none"> • Code, Compile and Execute Java Programs • Implement the Basic Concepts of Object Oriented Programming • use Packages in Java Programs • Implement the Concurrency Utilities in Java Programming 									
Content:									
Unit									Hrs
1	An Overview of Java Introduction of Object Oriented Programming Concepts, Class and Object, Encapsulation, Inheritance, Polymorphism, Abstraction, data hiding, Dynamic Binding, message communication. Advantages of oops, Application of oops. Introduction of JAVA, JDK, JRE, byte code, data type, variable, operator, type conversion and casting, iterating with loops, Constructor and Garbage collection.								9

	Static, final, abstract methods and classes. Access Specifier, friend Access. Use of this Keyword. Arrays, String Class and StringBuffer class, Wrapper Classes	
2	Inheritance and Interface Inheritance Basic, Use of super Keyword, multilevel hierarchy, method overriding, Abstract classes and methods, Use of final modifier, Defining and implementing Interface, Extending Interface. Default Interface Methods, Multiple inheritance Issues. Multithreading programming, Exception handling	9
3	Packages and generics Defining Package, finding package and CLASSPATH, Access protection, Importing package. Defining generics, generic class, generic methods, generic Interface, bounded types, generic class hierarchies. Util Package: Random, Date, Calendar and Gregorian calendar, Vector, Hashtable. Collection Framework – List, Set, Enumeration and Map.	9
4	Lambda Expressions Introducing Lambda Expressions, Block Lambda Expression, generic functional Interfaces, Passing Lambda Expressions as Arguments, Lambda Expressions and exceptions, Lambda Expressions and variable capture, Method references, Constructor references, Predefined Functional Interfaces.	9
5	Concurrency Utilities Concurrent API Packages, synchronization objects, Phaser, Executor, Concurrent Collections, Atomic Operations, Parallel Programming via the fork/join Framework	9
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Reference Books:		
1	JAVA: The Complete Reference Ninth Edition by Herbert Schildt	
2	JAVA SE 8 for Programmers Third Edition by Paul Deitel and Harvey Deitel	
Question Paper Scheme:		
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. SECTION – I Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. SECTION – II Q-2 (Must be from topics: 1 and 2 (6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))	



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Semester	III				Version	1.0.0.1			
Effective from Academic Year	2019-20				Effective for the batch Admitted in	June 2018			
Subject Code	U13A3DMS		Subject Name	DATABASE MANAGEMENT SYSTEM					
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	2	-	5	Theory	40	60	100
Hours	3	-	4	-	7	Practical	20	30	50

Objective:

To learn the fundamentals of Relational Database Management System. This course provides a practical hands-on introduction to manage oracle database using various SQL Commands.

Pre-requisites:

One should have Basic Knowledge of Computer and Microsoft Access Database.

Learning Outcome:

After completing this course, students should be able to learn:

- ✓ Effective transformation of the real-world data into the relational data model of the Database system and data retrieval and manipulations.
- ✓ Clear understanding for the need of a database and database designing concepts.
- ✓ Ability to store information without unnecessary redundancy.
- ✓ Ability to protect Database object using Grant and Revoke Commands from unauthorized user
- ✓ Clear understanding for the need of a database objects like Index, View, Sequence and Cluster

Content:

Unit		Hrs
1	<p>Database Concepts & Architecture</p> <p>Database Concepts : Introduction of Database, Structure of Database, Benefits of Database Approach, What is RDBMS? ,Dr. E. F. Codd's rules for RDBMS, DBMS vs. RDBMS</p> <p>Database Architecture : Three Levels of the Architecture: The External Level, The Conceptual Level and The Internal Level, Mappings between architecture's levels, Roles of Database Administrator, Introduction to Data Models (Hierarchical , Network and Relation Data Models)</p>	09

2	<p>Database Structure with Designing & Normalization:</p> <p>Database Structure with Designing : The E/R Modal, E/R Diagram & Database design with the E/R Model</p> <p>Normalization: Trivial and Non-Trivial Dependencies, Non-Loss Decomposition and Functional Dependencies, First, Second and Third Normal Forms, Dependency Preservation, Boyce/Codd Normal Form, Multi-Valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form</p>	08
3	<p>Interactive SQL Part I: Introduction to SQL, Logging into SQL *Plus, Naming Rules and Conventions, Data Types, SQL Components (DDL, DML, DCL, DQL), DDL Commands : Create, Alter, Drop, Truncate and Rename, DML Commands : Insert, Update and Delete Operation on table, DQL Commands : Select Clause, Constraints (Primary Key, Foreign Key, Unique Key, Not Null and Check Constraints), SQL Operators (Arithmetic Operators, Logical Operators and Range Searching Operator), SQL Predicate (IN, NOT IN and LIKE)</p>	10
4	<p>Interactive SQL Part II: Functions (Aggregate Functions and Scalar Functions), Group by and Having Clause, Group by using Rollup and Cube Operator, Sub Query, Exist and Not Exist Operator, Different types of Joins, Set Operators : Union, Intersect and Minus</p>	10
5	<p>Advance SQL with Security Management: Index, View, Sequence, Cluster, Granting and Revoking Permissions, Dump function, Creating user in oracle & Changing the password, Setting Environment Using SET Command, Spooling</p> <p>Case Study: Design database diagram that shows relation between tables and implement normalizations of below system.</p> <ol style="list-style-type: none"> 1) College Management System 2) Library Management System 	8
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Reference Books:		
1	Introduction to Database System by C. J. Date (8th edition)- Low Price Edition	
2	SQL, PL/SQL: The Programming Language of Oracle by Ivan Bayross (3rd and 4th Edition) BPB Publications	
3	Database System Concepts By Henry F. Korth (3rd Edition) TMH	
4	Database System Using Oracle - A Simplified to SQL and PL/SQL by Nilesh Shah(2nd Edition)	
Web Reference:		
Question Paper Scheme:		
<p>University Examination Duration: 3 Hours</p> <p>Note for Examiner: - Q-1 must be common from any topics from syllabus.</p>		

Q-2 and onwards must be from specific topics and internal choice or option can be given.

SECTION – I

Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30

Questions must be covered all possible section.

SECTION – II

Q-2 (Must be from topics: 1 and 2 (6+6))

Q-3 (Must be from topics: 3 and 4(6+6))

Q-4 (Must be from topic: 5(6))



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Semester	III				Version	1.0.0.1			
Effective from Academic Year	2019-20				Effective for the batch Admitted in	June 2018			
Subject Code	U13A4SAD		Subject Name		SYSTEM ANALYSIS AND DESIGN				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	-	-	3	Theory	40	60	100
Hours	3	-	-	-	3	Practical	-	-	-

Objective:

To learn the fundamental concepts of System, System Tools, System Techniques, System Design, Implementation and Testing.

Pre-requisites:

Basic Knowledge of Real System

Learning Outcome:

The Students should be able,

- ✓ To learn fundamental concepts of System
- ✓ To understand various System Tools and Techniques
- ✓ To learn System Design
- ✓ To learn various System Testing Types and its implementation

Content:

Unit		Hrs
1	System Concepts and Methodology: System Definition, Types of system, Characteristics of System, Elements of System, Need for system development, Role of System Analyst, System Development Life Cycle (SDLC), Difference b/w System Analysis and System Design, Need for Structured Analysis and Design, SSADM Methodology, System Prototype Method	12
2	System Tools and Techniques: Fact Finding Technique: Interview, Questionnaire, Record Review, Observation. System Flowchart, Type of System Flowchart, Principles of Flowchart, Data Flow Diagram, Symbols Used in DFD, Rules of DFD, Physical and Logical DFD, Data Dictionary, Entity Relationship Analysis, Decision Table, Decision Tree, Structured English	10

3	System Design: Code Design: Objectives, Principles of Code Design, Types of Codes. Form Design: Objectives, Types of Forms, Guideline for Form design, Form Design Steps. Input Design: Objectives, Data Capture, Data Validation. Output Design: Objectives, Principle of Output, Types of Output, Output Media.	10
4	System Implementation and Testing: Training, Conversion, Documentation, Need for Documentation, Level of Testing, Testing Principles, Testing Process, White Box Testing, Black Box Testing	8
5	Case Studies: College Management System Stock Management System Online Examination System Project Management System Hotel Management System	5
Practical Content:		
Reference Books:		
1	System Analysis, Design and Introduction to Software engineering , 10th Edition, - S.Parthasarthy & B.W.Khalkar, MasterAcademy	
2	Analysis and Design of Information Systems - James A. Senn-TMH	
3	Introduction to S.A.D. by LEE VOL. 1 & 2 Galgotia Publication	
Web Reference:		
Question Paper Scheme:		
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. SECTION – I Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. SECTION – II Q-2 (Must be from topics: 1 and 2(6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))	

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Semester	III				Version	1.0.0.0			
Effective from Academic Year		2018-19			Effective for the batch Admitted in			June 2016	
Subject code	U13A5OR		Subject Name		OPERATION RESEARCH				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	-	-	3	Theory	40	60	100
Hours	3	-	-	-	3	Practical	-	-	-
Pre-requisites:									
Basic Knowledge of Mathematics									
Learning Outcome:									
By the end of this module students should be able to									
<ul style="list-style-type: none"> • Find Optimal Solution using Linear Programming • Find Initial Basic Feasible Solution using different methods of Transportation Problems • Find Optimal Solution using Hungarian Method • Find Solution of Sequencing Problem by different methods 									
Theory syllabus									
Unit	Content								Hrs.
1	Linear Programming: Introduction and History of Operation Research, Assumption and Structure of an LPP, Formulation of an LPP Methods to find an Optimal Solution of an LPP: Graphical Method, Simplex Method								10
2	Transportation Problem – I : Definition, Mathematical Model of Transportation Problem, Methods for finding initial basic feasible solutions: North West Corner Method (NWCM), Least Cost Method (LCM), Vogel's Approximation Method (VAM)								10
3	Transportation Problem – II : Methods for finding an Optimal Solution: Modified Distribution Method (MODI Method) Variations in Transportation Problem, Degeneracy in Transportation Problem, Alternative Optimal Solutions, Prohibited (Restricted) Transportation Routes, Maximization Transportation Problem								9
4	Assignment Problem : Definition, Mathematical Model of Assignment Problem, Method for finding an Optimal Solution: Hungarian Method Complications of Assignment Problem, Alternative Optimal Solutions, Prohibited (Restricted) Assignment Problem, Maximization Assignment Problem								8

5	Sequencing Problem : Introduction, Notations, Terminology and Assumptions Method for Job Sequencing Problem: Processing N jobs on 2 Machines, Processing N jobs on 3 Machines, Processing N jobs on M Machines, Processing 2 jobs on M Machines (Graphic Method)	8
Practical Content		
Text Books		
1.	Operation Research: Theory and Applications, By J. K. Sharma, McMillan Pub.	
Reference Books		
1.	Operation Research: By S. D. Sharma, COMDEX	
2.	Operation Research: By Nita H. Shah, Ravi M. Gor, HardikSoni, Prentice-Hall of India Private Limited	

Note:

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L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work

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Note for Examiner

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Q-2 and onwards must be from specific topics and internal choice or option can be given

Paper Structure

SECTION-I

Q-1 Attempt any Five Out of Seven: each question must be 6 marks) --- 30 marks

Question must be covered all possible section.

SECTION-II

Q-2 (Must be from topics: 1 and 2 (6+6))

Q-3 (Must be from topics: 3 and 4(6+6))

Q-4 (Must be from topics: 5(6))



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Semester	III				Version	1.0.0.1			
Effective from Academic Year	2019-20				Effective for the batch Admitted in	June 2018			
Subject Code	U13B6EDM		Subject Name		ENVIRONMENT DISASTER MANAGEMENT				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	3	-	-	-	3	Theory	40	60	100
Hours	3	-	-	-	3	Practical	-	-	-
Objective:									
Improve the understanding of disaster risk, hazards, and vulnerabilities. Also Enhance disaster preparedness for effective response.									
Pre-requisites:									
Basic knowledge of Environment and Disaster Management.									
Learning Outcome:									
Will be able to learn about the environmental pollutions and learn different techniques to overcome these types of disaster as well as role of different organizations in rehabilitation.									
Content:									
Unit	Content								Hrs
1.	Introduction to Environment: Definition, Component of environment, Element of environment, Importance of environment Studies, Impact of Technology on the environment.								9
2.	Ecology & Ecosystems: Introduction Ecology, Concepts of an ecosystem, major part of ecosystem, type of ecosystem, classification & function of ecosystem, Components of ecosystem- Producers, Consumers, Decomposers, Hydrologic cycle.								9
3.	Environmental Pollution: Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources and Effects of air pollutants, what we do to reduce air pollution, Carbon credit.								9

	<p>Noise Pollution: Introduction Noise Measurement, Sources of Noise Pollution, Ambient noise levels (Noise Standard, Effects of noise pollution, Noise pollution controls.</p> <p>Water Pollution: Introduction, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants, Preventing from water Pollution.</p> <p>Current Environmental Global Issues: Global Warming & Green Houses Effects, Acid Rain, Depletion of Ozone Layer.</p>	
4.	<p>Introduction Disaster Management: What is Disaster? Hazard and types of Hazards, Disaster Management Cycle.</p> <p>Natural Disasters Awareness And Planning for Disaster: Floods, Earthquakes and Landslides, Cyclones and Tsunami.</p> <p>Manmade Disasters Awareness And Planning for Disaster: War and Terrorism, Riots and Demonstrations, Residential and Industrial Fires, Transportation Accidents, Nuclear Power Accidents.</p>	9
5.	<p>Role of Different Organizations in Rehabilitation: The Government and Disaster Recovery and Rehabilitation, Disaster and Non Governmental efforts, Role of Local Institutions: Insurance, Police, Media.</p>	9

Practical Content:

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Reference Books:

1.	Citizen's guide to disaster management by Satish Modh Publisher:-Macmillan Publishers India.
2.	Environment Engineering Vol-I & II, by Dr.S.K.Garg,
3.	Introduction to Air Pollution, by R.K.Trivedi & P.K.Goel.-BS Publications,
4.	Environmental Pollution Control Engineering, by C.S.Rao,
5.	Vol-I- Air Pollution, Vol-II- Water Pollution, Vol -V- Noise Pollution By S.K.AgarwalA.P.H.Publishing Corporation,
6.	Environmental Studies: R. Rajagopalan, Oxford University Press
7.	Environmental Science by Richard T Wright & Bernard J Nebel
8.	Environmental Science by Daniel B Botkin& Edward A Keller
9.	Environmental Engineering & Management by Suresh K Dameja
10.	Environmental Management by Dr.Swapan C Deb
11.	Environment & Ecology by Dr Gourkrishna Das mohapatra
12.	Introduction to Environmental Engineering and Science by Master Gilbert M.

Web Reference:

1

Question Paper Scheme:

<p>University Examination Duration: 3 Hours</p> <p>Note for Examiner: -</p> <p>Q-1 must be common from any topics from syllabus.</p>

Q-2 and onwards must be from specific topics and internal choice or option can be given.

SECTION – I

Q-1 (Attempt any Five Out of Seven: each question must be 6marks) – 30

Questions must be covered all possible section.

SECTION – II

Q-2 (Must be from topics: 1 and 2 (6+6))

Q-3 (Must be from topics: 3 and 4(6+6))

Q-4 (Must be from topic: 5(6))