R-19 SECOND YEAR SYLLABUS

SEMESTER II

SECOND YEAR SEMESTER – II												
Code	Course	Category	L	T	P	E	O	Total	Sessional Marks	External Marks	Total Marks	Credits
IT221	Operating Systems	PC	2	1	0	1	3	7	40	60	100	3
IT222	Probability Statistics & Queuing Theory	BS	3	0	0	1	6	10	40	60	100	3
IT223	Data Communications	PC	3	0	0	1	2	6	40	60	100	3
IT224	Database Management Systems	PC	2	1	0	1	3	7	40	60	100	3
IT225	Object Oriented Programming using JAVA	PC	3	0	0	1	4	8	40	60	100	3
IT226	Object Oriented Programming using JAVA Lab	PC	0	0	3	0	3	6	50	50	100	1.5
IT227	Operating Systems Lab	PC	0	0	3	0	3	6	50	50	100	1.5
IT228	Database Management Systems Lab	PC	0	0	3	0	3	6	50	50	100	1.5
TOTAL			13	2	9	5	27	56	350	450	800	19.5

OPERATING SYSTEMS

IT221 **Credits: 3**

Instruction: 2 Periods & 1 Tut/Week Sessional Marks: 40

End Exam: 3 Hours End Exam Marks: 60

Prerequisite:

Knowledge in Computer Organization.

Course Objectives:

- Understand Functions, Services and structure of Operating Systems.
- Understand processes, threads, schedulers and explanation of CPU scheduling.
- Understand issues related to Process Synchronization and focus on principles of Deadlock and related problems
- Comprehend the mechanisms used in Memory Management and Virtual Memory.
- Understand the concepts of File System, secondary storage management and Disk Scheduling

Course Outcomes:

1. Analyze basic concepts of operating system and their structures.
2. Analyze various issues related to inter process communication like process scheduling, resource management and deadlocks.
3. Interpret the issues and challenges of memory management.
4. Synthesize the concepts of I/O management, file system implementation and problems related to security and protection

Mapping of course outcomes with program outcomes:

	PO 1	*PO 2*	*PO 3*	*PO 4*	*PO 5*	*PO 6*	*PO 7*	*PO 8*	*PO 9*	*PO1 0*	*PO1 1*	*PO1 2*	*Pso 1*	*Pso 2*
CO														
1	*2*	*1*	*2*	*3*	*1*					*1*	*2*	*3*	*3*	*3*
2	*3*	*1*	*2*	*2*				*2*	*2*		*1*	*1*	*1*	*3*
3	*3*	*2*	*2*	*1*	*2*			*3*	*2*		*1*	*2*	*2*	*3*
4	*2*	*2*	*1*	*1*	*2*		*1*	*2*	*1*		*1*	*2*	*2*	*3*

UNIT – I 10 Periods

INTRODUCTION TO OS AND PROCESS MANAGEMENT

Introduction to operating systems ,operating system structures ,system calls, Process concept, CPU Scheduling: Scheduling criteria ,Scheduling algorithms , Multiple processor scheduling ,Real time scheduling ,Algorithm Evaluation. ,Operations on processes ,Cooperating processes ,Interprocess communication. Multi threaded programming.

Learning Outcome: At the end of this Unit the student will be able to

1. Explain Types of operating systems
2. Describe process states and process models

3. Compare processor scheduling algorithm

UNIT – II 10 Periods

PROCESS SYNCHRONIZATION AND DEADLOCK

Process Synchronization: The critical section problem ,Synchronization hardware ,Semaphores , Classic problems of synchronization ,critical regions , Monitors.

Deadlock: System model ,Deadlock characterization ,Methods for handling deadlocks ,Deadlock prevention , Deadlock avoidance, Deadlock detection ,Recovery from deadlock.

Learning Outcome: At the end of this Unit the student will be able to

1. Describe race condition & mutual exclusion
2. Identify Deadlocks
3. Apply Deadlock recovery procedure

UNIT – III 10 Periods

MEMORY MANAGEMENT

Memory Management: Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

Learning Outcome: At the end of this Unit the student will be able to

1. Describe memory management
2. Differentiate Contiguous and Non contiguous memory
3. Differentiate physical and virtual primary memory

UNIT – IV 8 Periods

FILE SYSTEMS AND ITS IMPLEMENTATION

File System Interface: File concept – Access methods – Directory structure – File system mounting – Protection. File System Implementation : Directory implementation – Allocation methods – Free space management – efficiency and performance – recovery – log structured file systems.

Learning Outcome: At the end of this Unit the student will be able to

1. Apply file management concepts in Operating System
2. Explain Directory structure of Operating System

UNIT – V 10 Periods

SECONDARY STORAGE STRUCTURES AND PROTECTION

Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Swap space management. Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability Based systems.

Learning Outcome: At the end of this Unit the student will be able to

1. Describe Disk organization
2. Implement file system security

CASE STUDY(Not considered in the examination): THE LINUX OPERATING SYSTEM: Linux history; Design principles; Kernel modules; Process management; Scheduling; Memory management; File systems, Input and output; Inter process communication

Text Book:

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Sixth Edition, Wiley India Pvt Ltd, 2003.

Reference Books:

1. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson Education, 2004.
2. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.
3. Harvey M. Deitel, "Operating Systems", Third Edition, Pearson Education, 2004.

PROBABILITY , STATISTICS AND QUEUING THEORY
[common to CSE& I.T.]

IT222 **Credits: 3**
Instruction: 3 Periods Sessional Marks: 40
End Exam: 3 Hours End Exam Marks: 60

1. Prerequisites : Elementary knowledge of Set theory, Combinations , Calculus and basic Statistics .

2. Course Objective :

The objective of this course is to provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

3. Course Outcomes: At the end of the course student should be able to:

CO - 1	Demonstrate basic principles of probability and understand a random variable that describe randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.
CO - 2	Comprehend concepts of discrete, continuous probability distributions and able to solve problems of probability using Binomial, Poisson, Uniform Distribution, Exponential Distribution, Normal distributions.
CO - 3	Compute simple correlation between the variables and fit straight line , parabola by the principle of least squares.
CO - 4	Analyze the statistical data and apply various small or large sample tests for testing the hypothesis.
CO - 5	Understand about different Queuing models and its applications.

Mapping of course outcomes with program outcomes:

Course Outcomes	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k
CO - 1	**3**								**1**		**3**
CO - 2	**3**								**1**		**3**
CO - 3	**3**								**1**		**3**
CO - 4	**3**								**1**		**3**
CO - 5	**3**								**1**		**3**

SYLLABUS

UNIT- I : PROBABILITY & MATHEMATICAL EXPECTATIONS (12 Periods)

Introduction to Probability : Definition of Random Experiment, Events and Sample space, Definition of probability, Addition and Multiplication theorems, Conditional probability, Baye's Theorem, Simple Problems on Baye's theorem.

Introduction to Random variable : Discrete and Continuous random variables, Distribution function of random variable, Properties, Probability mass function, Probability density function, Mathematical expectation, Properties of Mathematical expectation, Moments, Moment generating function ,Mean and Variance.

Learning outcome: At the end of this unit, student will be able to

- Calculate probabilities using conditional probability, Rule of total probability and Bayes' theorem(L_3)
- Explain the concept of a random variable and the probability distributions(L_5)
- Express the features of discrete and continuous random variables and explain about probability mass ,density function and formulate the distribution functions. (L_5)
- Calculate the expected value of a random variable and moments and formulates the Moment Generating Function(L_3)

UNIT- II : PROBABILITY DISTRIBUTIONS (14 Periods)

Discrete Distributions: Binomial Distribution, Poisson distribution-Mean ,Variance, MGF and problems.

Continuous Probability Distributions: Uniform Distribution, Exponential Distribution, Memoryless property, Normal Distribution, properties of Normal Distribution, Importance of Normal Distribution, Area properties of Normal curve - MGF, Mean ,Variance and simple problems

Learning outcome: At the end of this unit, student will be able to

- Understand importance of discrete probability distributions Binomial, Poisson and solve the problems about these distributions (L_2)
- Understand importance of continuous distributions Exponential ,Uniform and Normal and Exponential Distribution and solve the problems about these distributions(L_2)
- calculate probabilities of events for these distributions using the probability function, probability density function or cumulative distribution function (L_3)

UNIT - III : CURVE FITTING , CORRELATION AND REGRESSION

(10 Periods)

Curve Fitting : Principle of Least Squares, Method of Least Squares , Fitting of Straight lines, fitting of second degree curves and exponential curves

Correlation : Definition, Karl Pearson's Coefficient of Correlation Measures of correlation, Rank correlation coefficients.

Regression : Simple linear regression, Regression lines and properties.

Learning outcome: At the end of this unit, student will be able to

- Understand the concept of Principle of least squares for curve fitting of straight line ,second degree curve and exponential curve(L_2)
- Calculate Pearson's correlation coefficient, Spearman's rank correlation coefficient (L_3)
- Compute and interpret simple linear regression between two variables (L_3)
- Calculate regression coefficients and study the properties of regression lines (L_3)

UNIT- IV : TESTING OF HYPOTHESIS (14 Periods)

Introduction, Null hypothesis, Alternative hypothesis, Type –I, II errors, Level of significance, Critical Region. Confidence interval, one sided test, two sided test,

Small Sample Tests. : Students t - distribution , its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples , F-Distribution, Test of equality of two population variances, Chi-square test of goodness of fit .

Large sample Tests : Test of Significance of Large Samples – Tests of significance difference between sample proportion and population proportion & difference between two sample proportions , Tests of significance difference between sample mean and population mean & difference between two sample means.

Learning outcome: At the end of this unit, student will be able to

- Formulate null & alternate hypothesis, identify type I & type II errors(L_6)
- Formulate, calculate and interpret hypotheses test for one parameter and to compare two parameters, for both large and Small samples, Z and T for one two samples (L_6)
- Perform and analyze hypotheses tests of means, proportions and variances using both one-and two-sample data sets (L_4)
- apply the appropriate Chi-Squared test for independence and goodness of fit(L_3)

UNIT- V : QUEUING THEORY (10 Periods)

Structure of a queuing system, Operating characteristics of queuing system, Transient and steady states, Terminology of Queuing systems, Arrival and service processes- Pure Birth-Death process Deterministic queuing models- M/M/1 Model of infinite queue, M/M/1 model of finite queue.

Learning outcome: At the end of this unit, student will be able to

- Explain pure birth and death process(L_5)
- Analyze M/M/1 model and solve traffic flow problems of M/M/1 model(L_4)
- understand various elements of a queuing system and each of its description(L_2)

TEXT BOOK :

1. Probability, Statistics and Random Processes by T.Veerarajan, Tata McGraw Hill Publications.

REFERENCE BOOKS:

1. Probability & Statistics with Reliability, Queuing and Computer Applications by Kishor S. Trivedi , Prentice Hall of India .
2. Higher Engineering Mathematics by Dr. B.S Grewal, Khanna Publishers
3. Probability and Statistics for Engineers and Scientists by Sheldon M.Ross, Academic Press
4. Fundamentals of Mathematical Statistics by S C Gupta and V.K.Kapoor

DATA COMMUNICATIONS

IT223 **Credits: 3**

Instruction: 3 Periods & 1 Tut/Week Sessional Marks: 40

End Exam: 3 Hours End Exam Marks: 60

Course Objectives:

- Understand the basics of data communication and networking concepts included the OSI reference model
- List the physical layer protocols and their roles
- Describe physical layer signaling and encoding
- Explain how electrical signals can be used to represent data bits
- Understand basic models of communication with the help of telephone data communication

Course Outcomes:

After completion of this course, a student will be able to:	
1.	Understand and explain the concept of Data Communication and networks, layered architecture and their applications.
2.	Acquire the knowledge of different modulation techniques such as AM , FM and study the block diagrams of transmitter and receiver
3.	Learn the concepts of Digital modulation techniques such as PCM, DM, ADM and multiplexing techniques.
4.	Analyze different transmission mediums and switching techniques for effective reliable communication.
5.	Understand the design of telephone and cable networks in understand a communication model

Mapping of course outcomes with program outcomes:

		PO												**PSO**	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	3	3	2	1	1							2	2	2
	2	3	3	2	2	3		2					2	2	2
	3	3	3	2	2	3		2					2	2	2
	4	3	3	2	2	1	2						2	2	2
	5	3	2	2	1	1							2	1	1

SYLLABUS

UNIT-I **(8 hours)**

Overview: Introduction-Data Communications, Network, the Internet, Protocols and Standards. **Network Models**- Layered tasks, The OSI Model, Layers in the OSI Model, TCP/IP Protocol Suite, and Addressing.

Learning outcomes: At the end of the unit the students are able to

- Understand the rudiments of how computers communicate
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Explain the addressing and naming schemes used in network communications

UNIT-II **(8 hours)**

Physical Layer and Media: **Data and Signals**- Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission**- Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes.

Learning outcomes: At the end of the unit the students are able to

- Describe physical layer signaling and encoding of data in handling Analog and Digital signals for communication through a channel.
- Explain how electrical signals can be used to represent data bits

UNIT-III **(8 hours)**

Analog Transmission-Digital-To-Analog Conversion, Analog-To-Analog Conversion. **Bandwidth Utilization**: **Multiplexing and Spreading**-Multiplexing, Spread Spectrum
Learning outcomes: At the end of the unit the students are able to

- Understand data conversion schemes for effective communication through a channel.
- Enumerate how number of signals can be transmitted through a single physical medium at a time reducing the cost of transmission.
- Familiarize how bandwidth can be managed for effective communication

UNIT-IV **(7 hours)**

Transmission Media- Guided Media, Unguided Media: Wireless. **Switching-** Circuit-Switched Networks, Datagram Networks.

Learning outcomes: At the end of the unit the students are able to

- List the basic characteristics of copper cable, fiber optic cable, and wireless network media
- **Analyze the network connectivity** for making one-to-one communication by switching the data from node to node through different switching techniques

UNIT-V **(7 hours)**

Switching -Virtual-Circuit Networks, Structure Of a switch. Using Telephone and Cable Networks for Data Transmission- Telephone Network, Dial-Up Modems, Digital Subscriber Line, Cable TV Networks, Cable TV For Data Transfer

Learning outcomes: At the end of the unit the students are able to

- Understand the role of Virtual LANs (VLANs) in a switched LAN.
- Analyze the application aspects of data communication through telephone and cable networks.

Textbook:

Data Communications and Networking, Fourth Edition by Behrouza A. Forouzan,TMH.

Reference book:

1. Computer Networks, A.S.Tanenbaum,4th edition, Pearson education.
2. Introduction to Data communications and Networking, W.Tomasi,Pearson education.
3. Data and Computer Communications, G.S.Hura and M.Singhal, CRC Press, Taylor and Francis Group.

DATABASE MANAGEMENT SYSTEMS

IT224 **Credits: 3**

Instruction: 2 Periods &1Tut/Week Sessional Marks: 40

End Exam: 3 Hours End Exam Marks: 60

Prerequisite:

Relational Algebra, Set Theory, knowledge in anyprogramlanguage

Course Objectives:

- Understand basic database concepts, including the structure and operation of the relational data model.
- Construct simple and moderately advanced database queries using Structured Query Language (SQL).
- Understand and successfully apply logical database design principles, including E-R diagrams and database normalization.
- Understand the concept of a database transaction and related database facilities, including concurrency control, locking and protocols.

Course Outcomes:

After completion of this course, a student will be able to:	
1.	Model applications data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
2.	Apply relational database theory and describe relational algebra expression, tuple and domain relation expression for queries.
3.	Write SQL commands to create tables and indexes, insert/update/delete data and query data in arelational DBMS.
4.	Optimize the database design by applying functional dependency and normalization principles.
5.	Examine the serializability of non-serial schedules and compare and contrast the concurrency control protocols.

Mapping of course outcomes with program outcomes:

		PO												**PSO**	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	1	2	3					1	1	1		1	3	3
	2	1	3	1	1	2			1	1	1		1	3	3
	3	2	3	1	1	2			1	1	1		1	2	3
	4	1	1	3	2	2			1	1	1		1	3	2
	5	1	3	1					1	1	1		1	2	1

UNIT-I **8 Periods**

Introduction to DBMS: Overview, File system vs. DBMS, Advantages of DBMS, Structure of DBMS, Levels of Data Abstraction, Database Users and Administrators,
E-R model: Entities, Attributes and Entity sets, Relationship and Relationship sets, Features of ER model, Conceptual database design with ER model.

Learning Outcome: At the end of this Unit the student will be able to

- Understand database concepts and structures and query language
- Understand the E R model
- Design ER-models to represent simple database application scenarios

UNIT-II: **10Periods**

Relational model: Integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views. Relational Languages: algebra and calculus.

Learning Outcome: At the end of this Unit the student will be able to

- Understand the relational model
- Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data
- Explain the basic concepts of relational model, relational database design, relational algebra and relational Calculus

UNIT-III: **10 Periods**

SQL: Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, Database connectivity(ODBC and JDBC), Triggers and Active database, designing active databases.

Learning Outcome: At the end of this Unit the student will be able to

- Execute various advance SQL queries
- write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- Perform PL/SQL programming using concept of Cursor Management, Error Handling, Packages and Triggers

UNIT-IV: **10 Periods**

Normalization: Introduction to Schema Refinement - Problems Caused By Redundancy, Decomposition, Functional Dependency, Closure of a Set of FDs, Normal Forms (First, Second, Third normal forms, BCNF, Fourth & Fifth normal forms).

Learning Outcome: At the end of this Unit the student will be able to

- Understand Functional Dependency and Functional Decomposition.
- Apply various Normalization techniques.
- Improve the database design by normalization.

UNIT-V: **10 Periods**

Transaction management: Transaction concept, transactions and schedules, concurrent execution of transactions Concurrency control: Lock management, specialized locking techniques, concurrency control without locking.

Learning Outcome: At the end of this Unit the student will be able to

- understand transactions and their properties (ACID)
- understand the anomalies that occur without ACID
- understand the locking protocols used to ensure Isolation

TextBooks:

1. Raghu Ramakrishnanand Johannes Gehrke, "Database Management Systems", 3rd Edition,McGraw-Hill,2003.

ReferenceBooks:

1. Silberschatz, Korth and Sudharshan, "Data Base System Concepts", 5th Edition, McGraw Hill , 2006.
2. Elmasri, Navathe,"Fundamentals of Database Systems",5th Edition, Pearson Education, 2007.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

IT225 **Credits: 3**

Instruction: 3 Periods & 1 Tut/Week Sessional Marks : 40

End Exam: 3 Hours End Exam Marks: 60

Prerequisite:

Basic knowledge on introduction to programming & object oriented programming concepts are essential.

Course Objectives:

- To understand object oriented programming concepts, and apply them in problem solving.
- To introduce the concepts of exception handling and multithreading.
- To familiarize the concepts of File I/O and Database connectivity.
- To introduce the design of Graphical User Interface using applets and swing controls.

COURSE OUTCOMES:

After completion of this course, a student will be able to:	
1.	Apply OOP concepts in problem solving.
2.	Develop Applications using exception handing and multithreading.
3.	Apply the concepts of Java Files, collections and database in real time problem solving.
4.	Design GUI applications using AWT and Swing components.
5.	Design GUI applications using event handling, applets.

Mapping of course outcomes with program outcomes:

		PO												**PSO**	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	2	1	3									3	3	3
	2	2	2	3		2		2	2	2			2	3	3
	3	2	2	3								2	2	3	2
	4	2	2	3		2		2	2	2	2	2	2	3	3
	5	2	2	3		2		2	2	2	2	2	2	3	3

SYLLABUS

UNIT-I: **(12 Periods)**

Classes and objects : creating classes and objects , accessing methods , object initialization , java garbage collector.
Inheritance - Inheritance hierarchies, super and sub classes, Member access rules, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.
Polymorphism - dynamic binding, method overriding, abstract classes and methods.
Interfaces - Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interfaces.
Inner classes - uses of inner classes, local inner classes, anonymous inner classes, static inner classes, examples.
Packages - Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

Learning Outcomes:
At the end of this Unit the student will be able to

- Define Objects and Classes and methods
- Describe Inheritance and method overriding
- Explain inheritance on interfaces, implementing interface, multiple inheritance using interface
- Create and understand package, importing package, access rules for packages, class hiding rules in a package

UNIT-II: **(10 Periods)**

Exception handling - Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, re throwing exceptions, exception specification, built in exceptions, creating own exception sub classes.
Multithreading - Difference between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication.

Learning Outcomes:
At the end of this Unit the student will be able to

- Explain errors & exceptions
- Define & create threads, and can implement multithreading, thread priority & synchronization

UNIT-III: **(12 Periods)**

Collection Framework in Java - Introduction to Java Collections, Overview of Java Collection frame work, Commonly used Collection classes Array List, Vector, Hash table, Stack, Enumeration, Iterator, String Tokenizer, Scanner.

Files - streams - byte streams, character streams, text input/output, binary input/output, random access file operations, File management using File class.
Connecting to Database - JDBC drivers, connecting to a database, querying a database and processing the results, updating data with JDBC.

Learning Outcomes:
At the end of this Unit the student will be able to

- Illustrate appropriate use of collections in solving real world problems.
- Explain basics of streams, stream classes, creation, reading and writing files in context to file handling
- Create Database connection using drivers and can manipulate databases using queries.

UNIT-IV : (10 Periods)

GUI Programming with Java - The AWT class hierarchy, Introduction to Swing, Swing vs AWT, Hierarchy for Swing components, Containers - JFrame, JApplet, JDialog, JPanel, Overview of some swing components Jbutton, JLabel, JTextField, JTextArea, simple swing applications, Layout management - Layout manager types - border, grid and flow layouts.

Learning Outcomes:
At the end of this Unit the student will be able to

- Create GUI applications using AWT and Swing Components.
- Differentiate the AWT and Swing components.

UNIT –V : (8 Periods)

Event handling - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: handling a button click, handling mouse events, Adapter classes.
Applets - Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet, passing parameters to applets, applet security issues.

Learning Outcomes:
At the end of this Unit the student will be able to

- Create GUI applications using Applets.
- Develop GUI applications using event handlers.

TEXT BOOKS:

1. Java Fundamentals - A comprehensive Introduction, Herbet Schidt and Dale Srien, TMH.

REFERENCES BOOKS:

1. Java for Programmers, P.J. Deitel and H.M. Deitel, Pearson education
2. Object Orientd Programming through Java, P. Radha Krishna, Universities Press
3.

JAVA PROGRAMMING LAB

IT226 **Credits: 1.5**

Lab Hours: 3 Periods /Week Sessional Marks : 50

End Exam: 3 Hours End Exam Marks: 50

Prerequisite:

Basic knowledge on introduction to programming & object oriented programming concepts are essential.

Course Objectives:

- To understand object oriented programming concepts, and apply them in problem solving.
- To introduce the concepts of exception handling and multithreading.
- To familiarize the concepts of File I/O and Database connectivity.
- To introduce the design of Graphical User Interface using applets and swing controls.

COURSE OUTCOMES:

After completion of this course, a student will be able to:	
1.	Apply OOP concepts of Java for problem solving.
2.	Apply multithreading and exception handing.
3.	Apply the concepts of Java Files, collections and database in real time problem solving.
4.	Design GUI applications using AWT and Swing components.
5.	Design GUI applications using event handling, applets.

Mapping of course outcomes with program outcomes:

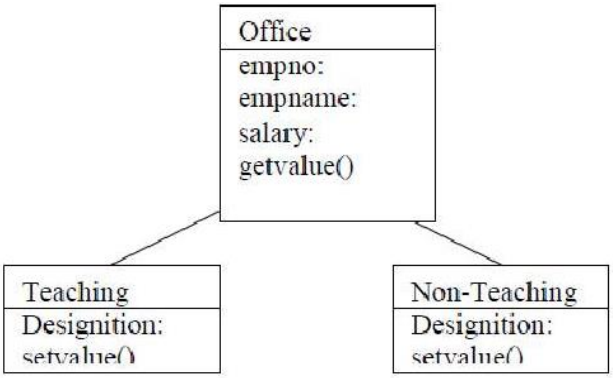
		PO												PSO	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	2	1	3									3	3	3
	2	2	2	3		2		2	2	2			2	3	3
	3	2	2	3								2	2	3	2
	4	2	2	3		2		2	2	2	2	2	2	3	3
	5	2	2	3		2		2	2	2	2	2	2	3	3

List of Programs:

1. Write a java program to calculate gross salary & net salary taking the following data. [CO-1]
   Input : empno,empname,basic
   Process: DA=50%of basic
   HRA=25%of basic

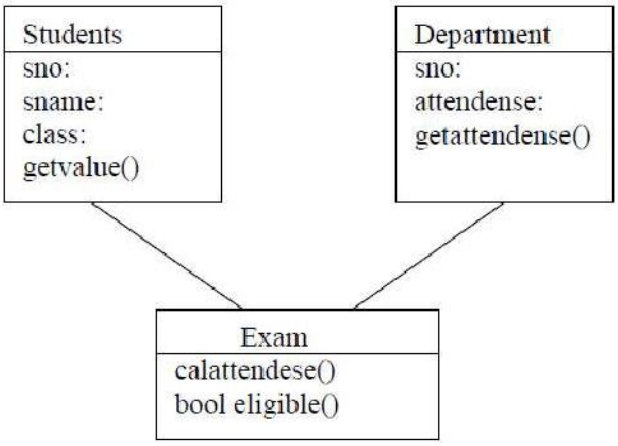
PF=10%of basic
PT=Rs100/-

2. Write a java program that implements educational hierarchy using inheritance. [CO1]



3. Write a program to identify the accessibility of a variable by means of different access specifies within and outside package. [CO1]

4. Write a java program to find the details of the students eligible to enroll for the examination (Students, Department combined give the eligibility criteria for the enrollment class) using interfaces. [CO1]



5. Write a Java program that displays area of different Figures (Rectangle, Square, Triangle) using the method overloading. [CO1]
6. Write a Java program that displays that displays the time in different formats in the form of HH,MM,SS using constructor Overloading. [CO1]
7. Write a Java program that counts the number of objects created by using static variable. [CO1]

8. Write a Java program to count the frequency of words, characters in the given line of text. [CO3]
9. Write a Java program for sorting a given list of names in ascending order. [CO3]
10. Write a Java program that reads a line of integers separated by commas and then displays each integer and fund the sum of he integers (using String Tokenizer). [CO3]
11. Write a Java program that reads a file name from the user then displays information about whether that file exists, file is writable, the type of file and length of the file in bytes. [CO3]
12. Write a Java program that reads a file and displays the file on the screen with a line number before each line. [CO3]
13. Write a Java program that reads a file and displays the no of lines and words in that file. [CO3]
14. Write a Java program that reads to copy source File and display on the console.[CO3]
15. Write a java program that implements Array Index out of bound Exception using built-in-Exception. [CO2]
16. Write a java program that implements bank transactions using user denied exception. [CO2]
17. Write a java program to identify the significance of finally block in handling exceptions. [CO2]
18. Write a java program to generate multiple threads of creating clock pulses.(using runnable interface). [CO2]
19. Write a java program to identify the use of synchronized blocks to synchronized methods. [CO2]
20. Write an applet to display a simple message on a colored background. [CO5]
21. Write an applet to display a moving banner showing the status of it. [CO5]
22. Write an applet to draw a simple and beautiful landscape. [CO5]
23. Write a java program to demonstrate key events by using Delegation event model. [CO5]
24. Write a java program to implement mouse events like mouse pressed, mouse released and mouse moved by means of adapter classes. [CO5]
25. Write a java program to demonstrate window events on frame. [CO5]
26. Write an applet that computes the payment of a loan based on the amount of the loan, interest rate and the number of months. [CO5]
27. Write an applet to perform the 4 basic arithmetic operations as buttons in a form accepting two integers in textboxes and display their result. [CO5]
28. Write a java program to design a registration form for creating a new eMail account. [CO4]
29. Write a java program to design the page authenticating user name and password by using SWING. [CO4]
30. Write a java program to design a calculator by using Grid Layout. [CO4]

OPERATING SYSTEMS LAB

IT227 **Credits: 1.5**

Practical: 3 Periods/Week Sessional Marks: 50

End Exam: 3 Hours End Exam Marks: 50

Prerequisite:

Operating System Concepts.

Course Objectives:

- Analyze the working of an operating system, its programming interface and file system.
- Develop algorithms for process scheduling, memory management, page replacement algorithms and disk scheduling

Course Outcomes:

After completion of this course, a student will be able to :	
1.	Analyze process management and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority., deadlock management.
2.	Implement memory management schemes and page replacement schemes.
3.	Implement file allocation methods and disk scheduling algorithms.
4.	Experiment with Unix commands and shell programming

Mapping of course outcomes with program outcomes:

		PO												PSO	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	3	1	2	2	2				2			1	3	2
	2	2	1	2	2	1				2			1	3	2
	3	1	1	2	2	2				1			3	3	3
	4			2	3	2				1			2	3	2

List of Experiments:

1 Shell Programming: a) Unix Commands b) Vi Commands c) Unix Shell programming commands a) Concatenation of two strings b) Comparison of two strings c) Maximum of three numbers d) Fibonacci series e) Arithmetic operation using case (CO4)

2 System Calls a) Process Creation b) Executing a command c) Sleep command d) Sleep command using getpid e) Signal handling using kill k) Wait command i)top (CO4)

3 I/O System Calls a) Reading from a file b) Writing into a file c) File Creation (CO4)

4 a) Implementation of ls command b)Implementation of grep command (CO4)

5 Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF.Print avg.waiting time and turnaround time. (CO1)

6 Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. Print avg.waiting time and turnaround time. (CO1)

7.a) Implement Bankers algorithm for Dead Lock Avoidance b) Implement an Algorithm for Dead Lock Detection(CO1)

8. Developing Application using Inter Process communication (using shared memory, pipes or message queues) (C01)

9. Producer-Consumer Problem using Semaphore(CO1)

10 Memory management Scheme-I a) Paging Concept(CO2)

11 Memory management Scheme-II a) Segmentation Concept(CO2)

12. Implement the all page replacement algorithms a) FIFO b) LRU c) LFU(CO2)

13 Implement any file allocation technique (Linked, Indexed or Contiguous)(CO3)

14 Linux system administration a. Becoming super user b. Temporarily changing user identity with su command c. Using graphical administrative tools d. Administrative commands e. Administrative configuration files(CO4)

15.Setting up Network File System.(CO3)

16.Firewall and Security Configuration(CO3)

Books:

1. Sumitabha Das, UNIX AND SHELL PROGRAMMING, Tata Mcgraw Hill Publishing Co Ltd
2. W. Richard Stevens, Stephen A.Rago , Advanced programming in the UNIX environment", 3rd Edition Pearson education.
3. Silberschatz, Galvin, and Gagne, “Operating System Concepts”, Sixth Edition, Wiley India Pvt Ltd, 2003.

DATABASE MANAGEMENT SYSTEMS LAB

IT228 Credits: 1.5
Practical: 3 Periods/week Sessional Marks:50
End Exam:3Hours End Exam Marks: 50

Prerequisite: Fundamentals ofcomputers, familiarity of any one program language

Course Objectives:

1. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing and implementing a DBMS.
2. Perform Pl/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers.
3. Understand query processing and techniques involved in query optimization.

Course Outcomes:

After completion of this course, a student will be able to:

1. Design and implement a database schema for a given problem-domain. Query a database using SQL DML/DDL commands.
2. Declare and enforce integrity constraints on a database using RDBMS and optimize the database using normalization concept.
3. Programming PL/SQL including stored procedures, stored functions, cursors, packages.

		PO												PSO	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO	**1**	1	2	3		2			1	1	1		1	3	3
	2	1	3	1	1	2			1	1	1		1	3	3
	3	2	3	1	1	2			1	1	1		1	2	3

List Of Experiments

1. DDL,DML,TCL, DCL commands ---------CO1

2. Creating users-roles and Granting privileges ---------CO1

3. Built in functions in oracle (String-Date-Aggregate functions etc.) ---------- CO1

4. Implement Integrity Constraints. (Key constraints-Domain constraints) CO2

5. Implementing joins-sub queries-nested and correlated nested queries CO2

7. Working with set comparison operators & views ---------- CO2

8. Working with aggregate functions, GROUP BY, HAVING clauses CO1

9. Implementing operations using PL/SQL blocks---------- CO3

10. Exception handling---------- CO3

11. Implementing cursors---------- CO3

12. Implementing triggers ----------CO3

13. Implementing functions and stored procedures & functions ---------- CO3

14. Implementing packages----------CO3

15. Implementing the concepts of Rollback-commit and checkpoints --------- CO1

16. Database connectivity---------CO3

CASE STUDIES:

1. Design ER Model for a given application & Convert ER model to Relational Model ----------CO1

2. How to normalize data on the given database application ----CO2

Reference Books:

1. Raghurama Krishnan, Johannes Gehrke, "Data base Management Systems", 3rd Edition, TATAMcGrawHill, 2008.
2. Silberschatz, Korth, "Data base System Concepts", 6th Edition, McGraw Hill,2010.3.C.J.Date,"Introduction to Database Systems", 7th Edition, Pearson Education,2002