Second Year/ Second Part

S.N.	Course Code	Subject
1	EG2201CT	Database Management System
2	EG2202CT	Data Structure and Algorithm
3	EG2203CT	Object Oriented Programming in Java
4	EG2204CT	Microprocessor and Computer Architecture
5	EG2205CT	Web Technology II
6	EG2206CT	Statistics and Probability

Database Management System

EG2201CT

Year: II **Total: 6 hours /week**

Part: II **Lecture: 3 hours/week**

Tutorial: 1 hours/week

Practical: hours/week

Lab: 2 hours/week

Course description:

This course covers the core principles and techniques required in the design and implementation of database systems. It consists of relational database systems RDBMS - the predominant system for business, scientific and engineering applications at present, Entity-Relational model, Normalization, Relational model, Relational algebra, and data access queries as well as an introduction to SQL. It also covers essential DBMS concepts such as: Transaction Processing, Concurrency Control and Recovery.

Course objectives:

The main objectives of this course are:

1. Explain the concepts of database and database management system.
2. Provide knowledge of database design using entity relationship diagram.
3. Perform on SQL statements, normalization, transaction processing, and database recovery.

Course Contents:

Theory

Unit 1. Introduction **[5 Hrs.]**

1.1. History, Database and its applications
1.2. Characteristics
1.3. Architecture
1.4. Data abstraction and Independence
1.5. Schemas and Instances
1.6. Classifications of DBMS
1.7. Introduction to DDL, DML, DCL

Unit 2. Data Models **[8 Hrs.]**

2.1. Introduction to Entity Relationship Model
2.2. Entities type
2.3. Entities set
2.4. Attributes and keys
2.5. Relationship types and sets
2.6. E-R diagrams

Unit 3. Normalization **[6 Hrs.]**

3.1. Importance of Normalization
3.2. Functional Dependencies
3.3. Integrity and Domain constraints
3.4. Normal forms (1NF, 2NF, 3NF, BCNF)

Unit 4. Relational Language **[8 Hrs.]**

4.1. Introduction to SQL
4.2. Features of SQL

4.3. Basic Retrieval queries
4.4. INSERT, UPDATE, DELETE queries
4.5. Join, Semi join and Sub queries
4.6. Views
4.7. Relational Algebra
    4.7.1. Select, Project
    4.7.2. Set Operations
    4.7.3. Cartesian Product
    4.7.4. Join

Unit 5. Query Processing **[6 Hrs.]**

5.1. Introduction to Query Processing
5.2. Query Cost estimation
5.3. Query Operations, Operator TREE
5.4. Evaluation of Expressions
5.5. Query Optimization
5.6. Performance Tuning

Unit 6. Transaction and Concurrency Control **[6 Hrs.]**

6.1. Introduction to Transaction
6.2. Serializability concept
6.3. Concurrent execution
6.4. Lock based Concurrency Control
6.5. 2PL and Strict 2PL
6.6. Timestamp concept

Unit 7. Recovery **[6 Hrs.]**

7.1. Failure Classifications
7.2. Recovery and Atomicity
7.3. IN PLACE and Out of Place Update
7.4. Log based Recovery
7.5. Shadow Paging
7.6. Local Recovery Manager
7.7. UNDO and REDO protocol

Practical: **[30 Hrs.]**

1. SQL Queries on CREATE, INSERT, DELETE, and UPDATE operations.
2. SQL query for SELECT operation.
3. SQL query for ALTER operations.
4. SQL queries on JOIN
5. SQL query using aggregate functions.
6. Apply SQL for specifying constraints.

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1	Introduction	5	8
2	Data Model	8	14
3	Normalization	6	11
4	Relational Language	8	14
5	Query Processing	6	11

6	Transaction and Concurrency Control	6	11
7	Recovery	6	11
	Total	**45**	**80**

* There may be minor deviation in marks distribution.

References:

1. Silberschatz, H.F. Korth, and S. Sudarshan (2010), Database System Concepts, 6th Edition, McGraw Hill
2. Ramez Elmasri and Shamkant B. Navathe (2010), Fundamentals of Database Systems, 6 th Edition, Pearson Addison Wesley
3. Raghu Ramakrishnan, and Johannes Gehrke (2007), Database Management Systems, 3rd Edition, McGraw-Hill
4. Jaffrey D. Ullman, Jennifer Widom; A First Course in Database Systems; Third Edition; Pearson Education Limited

Data Structure and Algorithm

EG2202CT

Year: II **Total: 7 hours /week**

Part: II **Lecture: 3 hours/week**

Tutorial: 1 hour/week

Practical: hours/week

Lab: 3 hours/week

Course Description:

The purpose of this course is to provide the students with the basic concepts of data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that might occur. This course offers the students a mixture of theoretical knowledge and practical experience.

Course Objectives:

On completion of this course the students will be enabled to:

1. Introduce data abstraction and data representation in memory.
2. Discuss, design and use elementary data structures such as stack, queue, linked list, tree and graph.
3. Decompose complex programming problems into manageable sub-problems.
4. Introduce theory of algorithms and their complexity.

Course Contents:

Theory

Unit 1. Introduction **[2 Hrs.]**

1.1. Algorithm and its types
1.2. Data structure and its types
1.3. Tools for algorithm analysis (Big O Notation)
  1.3.1. Type of analysis: Time and space complexity
  1.3.2. Asymptotic Notations: Big- O, Big-Ω and Big-θ

Unit 2. Stack and Queue **[6 Hrs.]**

2.1. Stack and Operation
  2.1.1. Continuous implementation of Stack with varying and fixed TOS
2.2. Application of Stack
  2.2.1. Converting Infix to Post fix expression
  2.2.2. Evaluating Post Fix expression
2.3. Queue and Operation
  2.3.1. Definition
  2.3.2. Algorithm of Enqueue and dequeue
  2.3.3. Linear Queue
  2.3.4. Circular Queue
  2.3.5. Priority Queue
  2.3.6. Applications of Queue

Unit 3. List **[8 Hrs.]**

3.1. Definition and Structure of link list
3.2. Advantage and disadvantages of link list

3.3. Operations in Singly Linked list
  3.3.1. Insertion at the beginning and end, after the node, before the node
  3.3.2. Deletion at the beginning and end, after the node, before the node
3.4. Doubly linked list
  3.4.1. Definition
  3.4.2. Structure of doubly linked list
  3.4.3. Insertion at the beginning and end, after the node, before the node
  3.4.4. Deletion at the beginning and end, after the node, before the node
  3.4.5. Advantages and disadvantages

Unit 4. Recursion **[3 Hrs.]**

4.1. Properties of recursion
4.2. Recursion vs Iteration
4.3. TOH and its solution
4.4. Solution of Fibonacci sequence and factorial

Unit 5. Trees **[6 Hrs.]**

5.1. Tree concepts
5.2. Binary tree
5.3. Application of binary tree
5.4. Node representation
5.5. Operation in Binary Tree
  5.5.1. Insertion
  5.5.2. Deletion
5.6. Algorithm of tree search
5.7. Tree traversals
  5.7.1. Pre order
  5.7.2. In order
  5.7.3. Post order
5.8. Height, level and depth of tree and its importance
5.9. AVL balance tree
  5.9.1. Definition
  5.9.2. Detection of unbalance
  5.9.3. Single and double rotation in balancing

Unit 6. Sorting **[6 Hrs.]**

6.1. Definition
6.2. Types of sorting (Internal and external)
6.3. Algorithm of Bubble sort
6.4. Algorithm of Insertion sort
6.5. Algorithm of Selection sort
6.6. Algorithm for Quick sort
6.7. Algorithm for Merge sort
6.8. Algorithm for Heap sort

Unit 7. Search **[7 Hrs.]**

7.1. Sequential search
7.2. Binary search
7.3. Tree search algorithm
7.4. Hashing

7.4.1. Definition
7.4.2. Hash function and Hash table
7.4.3. Collision in Hashing
7.4.4. Collision Resolution Techniques (Open and Closed)

Unit 8. Graph **[7 Hrs.]**

8.1. Components of Graph
8.2. Directed and Undirected
8.3. Connected and Unconnected
8.4. Path and Cycle
8.5. Adjacency sets and tables
8.6. Array based representation
8.7. Linked based and mixed implementation
8.8. Minimum Spanning Trees:
8.8.1. Kruskal's Algorithms and prim's algorithm
8.8.2. Algorithm of graph traversal (Depth First traversal, Breadth First traversal)
8.8.3. Shortest path algorithm

Practical: **[45 Hrs.]**

1. Implement stack using array
2. Implement linear and circular queue
3. Solve TOH & Fibonacci sequence using recursion
4. Implement linked list: singly and doubly
5. Perform basic operations on a binary tree data structure.
6. Implement binary search using function and without function.
7. Implement Hashing for handling the collision.

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1.	Introduction	2	4
2.	Stack and Queue	6	11
3.	List	8	14
4.	Recursion	3	5
5.	Trees	6	11
6.	Sorting	6	11
7.	Search	7	12
8.	Graph	7	12
	Total	**45**	**80**

* There may be minor deviation in marks distribution.

References:

1. Agarwal, U. (2012). Data Structure Using C. (3rd ed.). : S K Katari & Sons.
2. Tenenbaum, A.M, Langsam, Y & Augustein, M.J. (1996). Data Structure Using C and C++. (2nd ed.). India: Prentice Hall India.
3. Sahni, S. (2002). Data Structures, Algorithms and Applications in C++. (2nd ed.). India: University Press

Object-Oriented Programming in Java

EG2203CT

Year: II **Total: 8 hours /week**

Part: II **Lecture: 4 hours/week**

Tutorial: 1 hour/week

Practical: hours/week

Lab: 3 hours/week

Course description:

The purpose of this course is to introduce the concepts Object Oriented Programming using Java programming including introduction, basic structure, classes and objects, inheritance, interfaces, packages, exception handling, and multithreading. At the end, students will be able to write computer programs using different features of Java Programming.

Course objectives:

After completion of this course students will be able to:

1. Implement the concept of Object-Oriented Programming.
2. Implement object, class, inheritance, polymorphism, encapsulation and data abstraction in programming.
3. Implement the problems in Java using Object-Oriented approach.

Course Contents:

Theory

Unit 1. Object-Oriented Programming [3 Hrs.]

1.1. Procedure Oriented Programming
1.2. Object-Oriented Programming
1.3. Procedure Oriented versus Object Oriented Programming
1.4. OOP principles
1.5. Advantages and Disadvantages of OOP

Unit 2. Introduction to Java [2 Hrs.]

2.1. Java as a Programming Platform
2.2. History of Java
2.3. Java Buzzwords
2.4. Java Virtual Machine

Unit 3. Fundamental Programming Structures [10 Hrs.]

3.1. Whitespace, Identifiers, Literals, Comments, Separators and Keywords
3.2. Data Types and Conversion
3.3. Variables
3.4. Constants
3.5. Operators
3.6. Strings
3.7. Control Structures
3.8. Loop
3.9. Methods
3.10. Arrays

Unit 4. Classes and Objects [10 Hrs.]

4.1. Defining Class
4.2. Adding Variables
4.3. Adding Methods

4.4. Static Variables, Methods, Blocks and Class
4.5. Access Control
4.6. Method Parameters
4.7. Creating Objects
4.8. Accessing class members
4.9. Setters and Getters
4.10. Constructors
4.11. Overloading Methods
4.12. Call by value, Call by reference
4.13. this keyword
4.14. final modifier
4.15. Nested Classes
4.16. Wrapper Classes in Java
4.17. Garbage Collection

Unit 5. Inheritance [8 Hrs.]

5.1. Introduction
5.2. Types of Inheritance
5.3. Method Overriding
5.4. Using Super keyword
5.5. Execution of Constructors in Multilevel Inheritance
5.6. Abstract Classes and Methods

Unit 6. Interface and package [8 Hrs.]

6.1. Defining Interfaces
6.2. Extending Interfaces
6.3. Implementing Interfaces
6.4. Accessing Interface Variables
6.5. Introduction to java Packages
6.6. Creating a Package and naming convention
6.7. Using Packages

Unit 7. Exception Handling [6 Hrs.]

7.1. Exceptions and its types
7.2. Exception handling fundamentals (try, catch, throw, throws and finally)
7.3. Using try and catch
7.4. Using throw and throws

Unit 8. Multithreading [6 Hrs.]

8.1. Introduction of Thread
8.2. Creating a Thread
8.3. Thread Priorities
8.4. Life cycle of a Thread (Thread states)

Unit 9. I/O [7 Hrs.]

9.1. Java.io package
9.2. Byte Stream and Character Stream classes
9.3. Using FileInputStream and FileOutputStream classes
9.4. Using FileReader and FileWriter Classes

Practical: **[45 Hrs.]**

1. Install Java Tools.
2. Create and demonstrate programs using control statements and array.
3. Create and demonstrate programs using class, object, methods and constructor.
4. Create and demonstrate programs using inheritance.
5. Create and demonstrate programs using method overloading and method overriding.
6. Create and import Java Packages and Sub-Packages.
7. Create and demonstrate programs using interface.
8. Create and demonstrate programs for exception handling.
9. Create and demonstrate programs for concept of multithreading.
10. Create and demonstrate I/O programs.

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1	Object-Oriented Programming	3	4
2	Introduction to Java	2	3
3	Fundamental Programming Structures	10	13
4	Classes and Objects	10	13
5	Inheritance	8	11
6	Interface and package	8	11
7	Exception Handling	6	8
8	Multithreading	6	8
9	I/O and Java Applets	7	9
	Total	**60**	**80**

* There may be minor deviation in marks distribution.

References:

1. Balaguruswamy, E. (2014). *Programming with JAVA - A Primer: Third Edition.* McGraw-Hill Professionals.
2. David Holmes, K. A. (2005). *THE Java™ Programming Language, Fourth Edition.* Addison-Wesley Professional.
3. Horstmann, C. S. (2018). *Core Java Volume I--Fundamentals.* Pearson.
4. M. T. SOMASHEKARA, D. S. (2017). *OBJECT ORIENTED PROGRAMMING WITH JAVA.* PHI Learning Pvt. Ltd.
5. Mohan, P. (2013). *Fundamentals of Object-Oriented Programming in Java.* CreateSpace Independent Publishing Platform.

Microprocessor and Computer Architecture

EG2204CT

Year: II **Total: 7 hours /week**

Part: II **Lecture: 3 hours/week**

Tutorial: 1 hour/week

Practical: … hours/week

Lab: 3 hours/week

Course description:

This course is designed to explore architecture of a microprocessor and its programming in assembly language. The student will be able to apply logics to various given problems and develop programs using assembly language construct that would help them to develop real time microprocessor-based application programs. This course also includes the concept of instruction set architecture, organization or micro architecture and concepts of computer arithmetic.

Course objectives:

After completion of this course students will be able to:

1. Discuss the architecture of 8085 microprocessor and assembly language programming.
2. Demonstrate the basic structure and operation of digital computer.
3. Explain microprogrammed control unit.
4. Explore the concept of pipelining.
5. Discuss data and algorithm used to perform operations on data.

Course Contents:

Theory

Unit 1. Introduction of Microprocessor [8 Hrs.]

1.1. Evolution of microprocessor and it's types
1.2. Microprocessor Bus organization: Data Bus, Address Bus and Control Bus
1.3. Operations of microprocessor: internal data manipulation, microprocessor initiated and peripheral or external initiated
1.4. Pin diagram and internal Architecture of 8085
1.5. Internal registers organization of 8085
1.6. Limitations of 8085

Unit 2. Instruction Cycle and Timing Diagram [3 Hrs.]

2.1. 8085 machine cycles
2.2. Bus timings to fetch, decode, execute instruction from memory
2.3. Memory read and write
2.4. Input/output read and write cycle with timing diagram

Unit 3. 8085 Instruction set [12 Hrs.]

3.1. Machine language instruction format:
  3.1.1. Single byte
  3.1.2. Two bytes
  3.1.3. Three-byte instructions
3.2. Various addressing modes
3.3. Data transfer operation and instruction
3.4. Arithmetic operation and instruction
3.5. Logical operation and instruction

3.6. Branch operation and instruction
3.7. Stack operation and instruction
3.8. Input/output and machine control operation and instruction
3.9. Simple programs with 8085 instructions

Unit 4. Basic Computer Architecture [4 Hrs.]

4.1. Introduction
  4.1.1. History of Computer Architecture
  4.1.2. Overview of Computer Organization
  4.1.3. Memory Hierarchy and cache
4.2. Instruction Codes
4.3. Stored Program Organization
4.4. Indirect address, computer registers
4.5. Common Bus system
4.6. Instruction sets
4.7. Instruction types

Unit 5. Design of Microprogrammed Control Unit [10 Hrs.]

5.1. Control Word, Microprogram, Control Memory
5.2. Control Address Register, Sequencer
5.3. Address Sequencing
5.4. Conditional Branch
5.5. Mapping of Instructions
5.6. Subroutines, Microinstruction Format, Symbolic Microinstructions
5.7. Central Processing Unit
  5.7.1. Introduction
  5.7.2. General Register Organization
  5.7.3. Stack Organization
5.8. Instruction Formats
5.9. Addressing Modes
5.10. RISC vs CISC
5.11. Pipeline and Vector Processing
  5.11.1. Arithmetic and Instruction pipeline
  5.11.2. Vector operations
  5.11.3. Matrix Multiplication, memory interleaving

Unit 6. Computer Arithmetic [3 Hrs.]

6.1. Data Representation
  6.1.1. Fixed point Representation
  6.1.2. Floating point Representation
6.2. Addition and Subtraction with Signed Magnitude Data
6.3. Addition and Subtraction with Signed 2's Complement Data
6.4. Multiplication of Signed Magnitude Data
6.5. Booth Multiplication

Unit 7. Input Output Organization [5 Hrs.]

7.1. Input-Output Interface
  7.1.1. I/O Bus and Interface Modules
  7.1.2. I/O vs. Memory Bus
  7.1.3. Isolated vs. Memory-Mapped I/O

7.2. Asynchronous Data Transfer: Strobe, Handshaking
7.3. Modes of Transfer:
  7.3.1. Programmed I/O
  7.3.2. Interrupt-Initiated I/O
  7.3.3. Direct memory Access
7.4. Direct Memory Access, Input-Output Processor, DMA vs. IOP

Practical: **[45 Hrs.]**

1. Demonstrate 8085 using kit/simulator
2. Implement program to perform arithmetic operations (Add, subtract, multiply and divide) on signed and unsigned two 8-bit numbers.
3. Implement a program to mask the lower four bits of content of the memory location.
4. Implement a program to set higher four bits of content of the memory location to 1.
5. Implement a program to perform Exclusive OR of two numbers.
6. Implement a program to exchange the content of two memory locations.
7. Implement program to add/subtract 16-bit numbers
8. Implement program to copy content of one memory location to another memory location.
9. Implement a program to check whether given no is odd or even.
10. Implement a program to count no of zero value in given block of data.
11. Implement algorithms for computer arithmetic using high level language like C or C++

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1	Introduction of Microprocessor	8	14
2	Instruction Cycle and Timing Diagram	3	5
3	8085 Instruction set	12	22
4	Basic Computer Architecture	4	7
5	Design of Microprogrammed Control Unit	10	18
6	Computer Arithmetic	3	5
7	Input Output Organization	5	9
	Total	**45**	**80**

* There may be minor deviation in marks distribution.

References:

1. Stallings W, Computer Organization and Architecture, 4th Edition, Prentice Hallof India Private Limited.
2. Malvino A.P., Brown J.A., Digital Computer Electronics, 3rd Edition, Tata McGraw Hill Hall
3. D.V, Microprocessors and Interfacing– Programming and Hardware, McGraw Hill
4. Gaonkar R, Microprocessor Architecture, Programming, and application with 8085, Penram International Publication

Web Technology II

EG2205CT

Year: II **Total: 7 hours /week**

Part: II **Lecture: 3 hours/week**

Tutorial: 1 hour/week

Practical: hours/week

Lab: 3 hours/week

Course description:

The purpose of this course is to introduce the concepts of Web Technology using PHP programming including introduction, basic structure, classes and objects, inheritance and exception handling. This course also helps to implement database connectivity and manipulation, XML, AJAX and PHP framework. At the end, students will be able to design and develop dynamic web contents and applications.

Course objectives:

After completion of this course students will be able to:

1. Implement PHP for the basic of server-side scripting language
2. Apply PHP and MySQL for the fundamentals of database, database design and their uses in web programming
3. Use XML, AJAX and Content Management Systems

Course Contents:

Theory

Unit 1. Web Server Concept **[5 Hrs.]**

1.1. Introduction to Web Server
1.2. Architecture of web server
1.3. Concept of Dynamic Content
1.4. Using control flow to control dynamic content generation
1.5. Concept of Architecting Web Application

Unit 2. Review of Database: MySQL **[4 Hrs.]**

2.1. Introduction to MySQL
2.2. MySQL queries
  2.2.1. Create
  2.2.2. Insert
  2.2.3. Select
  2.2.4. Update
  2.2.5. Delete
  2.2.6. Alter
2.3. Database Normalization

Unit 3. Server-Side Script: PHP **[12 Hrs.]**

3.1. Introduction of PHP
3.2. Advantage of using PHP for web development
3.3. PHP Installation
3.4. PHP Syntax
3.5. Comments, Variable, Operators, Datatype, Strings, Keywords
3.6. Conditional Statements
3.7. Loop
3.8. Arrays

3.9. Functions
3.10. Passing variables with data between pages
  3.10.1. Get & Post Method
  3.10.2. Cookies
  3.10.3. Sessions
3.11. File Upload: Date, Include, File, File Upload
3.12. Accessing Form Elements, Form Validation
3.13. Exception and Error Handling

Unit 4. Object oriented concept and Database Connectivity [8 Hrs.]

4.1. Classes and Objects
4.2. Access Modifiers
4.3. Constructors and Destructors
4.4. Inheritance and Scope
4.5. Overwriting Methods
4.6. Database Connectivity
  4.6.1. Creating database with Server-Side Script
  4.6.2. Connecting Server-Side Script to Database
  4.6.3. Multiple Connections
  4.6.4. Making queries
  4.6.5. Building in Error Checking
  4.6.6. Fetching Data sets
  4.6.7. Displaying Queries in tables
  4.6.8. Building Forms and control form data using queries

Unit 5. AJAX and eXtensible Markup Language (XML) [8 Hrs.]

5.1. Basic concept of AJAX
5.2. Features of XML
5.3. Structure of XML: Logical Structure, Physical Structure
5.4. Naming Rules
5.5. XML Elements
5.6. XML Attributes
5.7. Element Content Models: Element Sequences i.e., <!ELEMENT counting (first, second, third, fourth)>, Element Choices <!ELEMENT choose (this.one | that.one)>, Combined Sequences and Choices
5.8. Element Occurrence Indicators: -Discussion of Three Occurrence Indicators? (Question Mark) * (Asterisk Sign) + (Plus Sign)
5.9. XML schema languages: Document Type Definition (DTD), XML Schema Definition (XSD)
5.10. XML Style Sheets (XSLT)

Unit 6. PHP Framework [8 Hrs.]

6.1. Introduction
6.2. Features
6.3. Basic DB & Client-Side Validation
6.4. Session & Email System
6.5. Framework with method, Classes and Cookies

Practical: **[45 Hrs.]**

1. Installing required software and platforms for local servers and scripting (IDE, XAMPP, WAMPP, LAMPP etc.)
2. Simple programs using;
   2.1 Control and loops
   2.2 Strings
   2.3 Arrays
   2.4 Functions
3. Passing Information between pages
4. Forms handling, validation etc.
5. Writing to file, reading from file and file upload
6. Examples of sessions and cookies
7. Connecting to database
8. Using various queries on database to extract, insert, update and delete from the web interface
9. Using XML markup elements and its attributes
10. Concept of using simple AJAX in webpage
11. Design and develop a dynamic web page which should include database

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1	Web Server Concept	5	10
2	Review of database: MySQL	4	8
3	Server-Side Script: PHP	12	20
4	Object oriented concept and Database Connectivity	8	14
5	AJAX and eXtensible Markup Language (XML)	8	14
6	PHP Web Design Framework	8	14
	Total	**45**	**80**

* There may be minor deviation in marks distribution.

References:

1. Bayross "*Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, PHPI*" BPB Publication
2. Hornberger Allen, "*Mastering in PHP*", BPB Publication
3. Converse and Park with Morgan "*PHP MYSQL Bible*" WILEY Publication
4. Sybex "*ASP, ADO and XML Complete*" BPB Publication
5. Russell "*Mastering Active Server Pages* "(BPB)

Statistics and Probability

EG2206CT

Year: II **Total: 4 hours /week**

Part: II **Lecture: 3 hours/week**

Tutorial: 1 hour/week

Practical: hours/week

Lab: hours/week

Course description:

This course deals with a practical knowledge of the principles and concept of probability and statistics and their application to simple engineering problems.

Course objectives:

After completion of this course students will be able to:

1. Explain the principles and concept of probability.
2. Apply statistics to solve simple engineering problems.

Course Contents:

Theory

Unit 1. Introduction of Statistics [3 Hrs.]

1.1. Origin and development of statistics
1.2. Definition of statistics
1.3. Importance and scope of statistics
1.4. Limitation of statistics

Unit 2. Collection of data. [3 Hrs.]

2.1. Data, types of data
2.2. Methods of collecting primary data
2.3. Sources of secondary data

Unit 3. Classification and Tabulation [3 Hrs.]

3.1. Classification of data
3.2. Meaning and Importance of table
3.3. Parts of table

Unit 4. Diagrammatic and graphic representation [4 Hrs.]

4.1. Difference between diagram and graphs
4.2. Bar diagram and its type
4.3. Histogram and pie diagram
4.4. Graphical representation of data
4.5. Limitation of diagrams and graphs

Unit 5. Summarizing a Data set [8 Hrs.]

5.1. Introduction
5.2. Measures of central tendency (Mean, Medain, Mode, G.M, S.M)
5.3. Partition values (quartiles, deciles, percentiles)
5.4. Measures of description (rage, Q.D., M.D., S.D.)

Unit 6. Bivariate data analysis [8 Hrs.]

6.1. Correlation (karl pearson's coefficient of correlation)
6.2. Lines of regression, equations of regression

Unit 7. Classification and Tabulation **[6 Hrs.]**

7.1. Definition and terminology of probability
7.2. Counting rule (permutation and combination)
7.3. Addition theorem of probability
7.4. Theorem of compound probability or multiplication

Unit 8. Classification and Tabulation **[10 Hrs.]**

8.1. Random variables
8.2. Binomial Distribution
8.3. Poisson distribution
8.4. Normal distribution

Final written exam evaluation scheme			
Unit	**Title**	**Hours**	**Marks Distribution***
1	Introduction of Statistics	3	5
2	Collection of data	3	5
3	Classification and Tabulation	3	5
4	Diagrammatic and graphic representation	4	5
5	Summarizing a data set	8	15
6	Bivariate data analysis	8	15
7	Concept of probability	6	10
8	Theoretical probability distribution	10	20
	Total	**45**	**80**

* There may be minor deviation in marks distribution.

References:

1. Dr. Arun Kumar Chaudhary, Aswin 2078, Business statistics, Bhudipuran Prakashan, Bagbazar.
2. S.C. Gupta, 2018, Fundamentals of statistics, Himalaya Publishing House, India
3. H.C. Saxena, 17th edition, Elementary Statistics, S.Chand & CO. Ltd., India