K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BENGALURU - 560109
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
CO-PO Mapping

Course: Data Structures and Applications	
Type: Professional Core Course	**Course Code: BCS304**

No of Hours

Theory (Lecture Class)	Tutorials	Practical/Field Work/Allied Activities	Total/Week	Total hours of Pedagogy
3	0	0	3	40

Marks

CIE	SEE	Total	Credits
50	50	100	3

Aim/Objectives of the Course

1. To explain fundamentals of data structures and their applications
2. To illustrate representation of data structures: Stack, Queues, Linked Lists, Trees and Graphs.
3. To design and develop solutions to problems using linear Data Structures.
4. To discuss applications of Nonlinear Data Structures in problem solving
5. To introduce advanced Data structure concepts such as Hashing and Optimal Binary Search Trees.

Course Learning Outcomes
After completing the course, the students will be able to

CO1	**Apply** the basic data structures concepts such as arrays, structures, unions, pointers, strings and dynamic memory allocation function to solve simple problems. **Make use of** stacks to evaluate mathematical expression.	**Applying (K3)**
CO2	**Apply** the concept of queues and linked list in problem solving.	**Applying (K3)**
CO3	**Utilize** linked list for implementation of list operations, doubly linked list and sparse matrix, and **apply** tree traversal method, threaded binary tree.	**Applying (K3)**
CO4	**Make use of** binary search tree, selection trees and forests and graph to solve real world problems.	**Applying (K3)**
CO5	**Analyze** advanced Data Structures concepts such as Hashing Techniques and OptimalBinary Search Trees.	**Applying (K3)**

Syllabus Content

MODULE 1 : INTRODUCTION TO DATA STRUCTURES: Data Structures, Classifications (Primitive & Non-Primitive), Data structure Operations **Review of** pointers and dynamic Memory Allocation, **ARRAYS and STRUCTURES:** Arrays, Dynamic Allocated Arrays, Structures and Unions, Polynomials, Sparse Matrices, representation of Multidimensional Arrays, Strings.	CO1 8 hrs PO1-1 PO2-3 PO3-3 PO4-3 PO6-1

STACKS: Stacks, Stacks Using Dynamic Arrays, Evaluation and conversion of Expressions.
 	
LO: At the end of this session the student will be able to
  1. Understand the basic data structures concepts.
  2. Analyze the stack operations, dynamic memory allocation and Structures.
  3. Understand the sparse matrix and evaluation and conversion of expressions.
	PO12 -1
	PSO1-3
	PSO2-1

MODULE 2 : QUEUES: Queues, Circular Queues, Using Dynamic Arrays, Multiple Stacks and queues.
LINKED LISTS : Singly Linked, Lists and Chains, Representing Chains in C, Linked Stacks and Queues, Polynomials
 	
LO: At the end of this session the student will be able to
  1. Analyze Queue operations using dynamic arrays.
  2. Understand the concepts of linked list and chains.
  3. Solve simple problems on linked list such as polynomials.
	CO2
	
	8 hrs.
	
	PO1-1
	PO2-3
	PO3-3
	PO4-3
	PO6-1
	PO12-1
	PSO1-3
	PSO2-1

MODULE 3: LINKED LISTS : Additional List Operations, Sparse Matrices, Doubly Linked List.
TREES: Introduction, Binary Trees, Binary Tree Traversals, Threaded Binary Trees.
LO: At the end of this session the student will be able to
  1. Understand the concepts of doubly linked list and Trees terminologies.
  2. Solve binary tree traversals.
  3. Solve simple problems on linked list such as sparse matrix.
	CO3
	
	8 hrs
	
	PO1-1
	PO2-3
	PO3-3
	PO4-3
	PO6-1
	PO12-1
	PSO1-3
	PSO2-1

MODULE 4: TREES(Cont..): Binary Search trees, Selection Trees, Forests, Representation of Disjointsets, Counting Binary Trees,
GRAPHS: The Graph Abstract Data Types, Elementary Graph Operations
LO: At the end of this session the student will be able to
  1. Understand the Binary Search trees, Forests and counting Binary trees.
  2. Understand the graph terminologies.
  3. Analyze elementary Graph operations
	CO4
	
	8 hrs
	
	PO1-1
	PO2-3
	PO3-3
	PO4-3
	PO6-1
	PO12-1
	PSO1-3
	PSO2-1

MODULE 5: HASHING: Introduction, Static Hashing, Dynamic Hashing
PRIORITY QUEUES: Single and double ended Priority Queues, Leftist Trees
INTRODUCTION TO EFFICIENT BINARY SEARCH TREES: Optimal Binary Search Trees.
 	
LO: At the end of this session the student will be able to
  1. Understand hashing technique.
  2. Analyze Single and double ended priority queues, leftist trees.
	CO5
	
	8hrs
	
	PO1-1
	PO2-3
	PO3-3
	PO4-3
	PO6-1
	PO12-1

3. Understand Optimal Binary search Trees.	PSO1-3 PSO2-1

Text Books

1. Ellis Horowitz and Sartaj Sahni, **Fundamentals of Data Structures in C**, 2nd Ed, Universities Press, 2014.

Reference Books (specify minimum two foreign authors text books)

1. Seymour Lipschutz, **Data Structures Schaum's Outlines**, Revised 1st Ed, McGraw Hill, 2014.
2. Gilberg & Forouzan, Data Structures: **A Pseudo-code approach with C**, 2nd Ed, Cengage Learning,2014.
3. Reema Thareja, **Data Structures using C**, 3rd Ed, Oxford press, 2012.
4. Jean-Paul Tremblay & Paul G. Sorenson, **An Introduction to Data Structures with Applications**, 2nd Ed, McGraw Hill, 2013
5. A M Tenenbaum, **Data Structures using C**, PHI, 1989
6. Robert Kruse, **Data Structures and Program Design in C**, 2nd Ed, PHI, 1996.

Useful Websites

- http://elearning.vtu.ac.in/econtent/courses/video/CSE/06CS35.html
- https://nptel.ac.in/courses/106/105/106105171/
- http://www.nptelvideos.in/2012/11/data-structures-and-algorithms.html
- https://www.youtube.com/watch?v=3Xo6P_V-qns&t=201s
- https://ds2-iiith.vlabs.ac.in/exp/selection-sort/index.html
- https://nptel.ac.in/courses/106/102/106102064/
- https://ds1-iiith.vlabs.ac.in/exp/stacks-queues/index.html
- https://ds1-iiith.vlabs.ac.in/exp/linked-list/basics/overview.html
- https://ds1-iiith.vlabs.ac.in/List%20of%20experiments.html
- https://ds1-iiith.vlabs.ac.in/exp/tree-traversal/index.html
- https://ds1-iiith.vlabs.ac.in/exp/tree-traversal/depth-first-traversal/dft-practice.html
- https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01350159542807756812559/overview

Teaching and Learning Methods

1. Lecture class: 40 hrs

Assessment Details (both CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by the University as per the scheduled timetable, with common question papers for the course (duration 03 hours).
1. The question paper will have ten questions. Each question is set for 20 marks. 2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
3. The students have to answer 5 full questions, selecting one full question from each module. Marks scored shall be proportionally reduced to 50 marks.

CO to PO Mapping

PO1: Science and engineering Knowledge	**PO7:** Environment and Society
PO2: Problem Analysis	**PO8:** Ethics
PO3: Design & Development	**PO9:** Individual & Team Work
PO4: Investigations of Complex Problems	**PO10:** Communication
PO5: Modern Tool Usage	**PO11:** Project Mgmt. & Finance
PO6: Engineer & Society	**PO12:** Lifelong Learning

PSO1: An ability to design and develop Artificial Intelligence technology into innovative products for solving real world problems.

PSO2: An ability to design and develop Data Science methods for analyzing massive datasets to extract insights by applying AI as a tool.
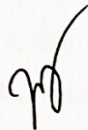
CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
BCS3 04	K-level														
CO1	K3	1	3	3	3	-	1	-	-	-	-	-	1	3	1
CO2	K3	1	3	3	3	-	1	-	-	-	-	-	1	3	1
CO3	K3	1	3	3	3	-	1	-	-	-	-	-	1	3	1
CO4	K3	1	3	3	3	-	1	-	-	-	-	-	1	3	1
CC	K3	1	3	3	3	-	1	-	-	-	-	-	1	2	1
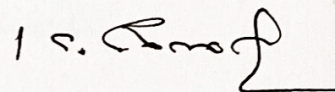
Course In charge   HOD   IQAC Coordinator   Principal

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
DEPARTMENT OF COMPUTER SCIENCE AND BUSINESS SYSTEMS
CO-PO Mapping

Course: OOPS with JAVA			
Type: Core		Course Code: BCS306A	
No of Hours			
Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total/Week	Total Teaching Hours
4	4	4	40+20=60
Marks			
Internal Assessment	Examination	Total	Credits
50	50	100	03

Aim/Objectives of the Course

1. To learn primitive constructs JAVA programming language.
2. To understand Object Oriented Programming Features of JAVA.
3. To gain knowledge on: packages, multithreaded programing and exceptions.

Course Learning Outcomes
After completing the course, the students will be able to

CO1	Demonstrate proficiency in writing simple programs involving branching and looping structures.	Applying (K3)
CO2	Design a class involving data members and methods for the given scenario.	Applying (K3)
CO3	Apply the concepts of inheritance and interfaces in solving real world problems.	Applying (K3)
CO4	Use the concept of packages and exception handling in solving complex problem.	Applying (K3)
CO5	Apply concepts of multithreading, autoboxing and enumerations in program development.	Applying (K3)

Syllabus Content	
Module1: An Overview of Java: Introduction to Object Oriented Concepts A Review of Object–Oriented Programming principles, Comparison of Object-Oriented Language with C, Lexical issues (Whitespace, Identifiers, Literals, Comments, Separators, The Java Keywords). **Introduction to Java:** Features of Java, the Byte code; Java Development Kit (JDK); the Java Buzzwords, Object-oriented programming; Simple Java programs. Data types, variables and arrays, Operators, Control Statements. **LO:** At the end of this module the student will be able to 1. Learn basic skills & concepts of object-oriented approach. 2. Learn the use of data types, tokens, variable & operators in java 3. Demonstrate the ability to use simple data structure like arrays in java.	CO1 8Hours PO1-3 PO2-2 PO3-1 PO5-1 PO9-1 PO12 -3 PSO1-3 PSO2-1

	CO2

Module 2
Class and Objects: Class Fundamentals, Declaring Objects, Introducing Methods, Constructors, Overloading Methods, Access Control, understanding static, introducing final, Introducing Nested and Inner Classes.
LO: At the end of this module the student will be able to
   1. Understand the importance of Java Concepts Learn basic skills & concepts of object-oriented approach.
   2. Learn to write, compile & execute basic java program.
   3. Design and develop simple program using OOP's concepts.
	8Hours
	
	PO1-3
	PO2-3
	PO3-1
	PO5-1
	PO9-1
	PO12 -2
	PSO1-3
	PSO2-1

	CO3

Module 3
Classes, Inheritance, Interfaces:
Inheritance: inheritance basics, using super, creating multi-level hierarchy, method overriding, Dynamic Method Dispatch, Using Abstract Classes, The Object Class.
Interfaces: Interfaces, Default Interface Methods, Use static Methods in an Interface, Private Interface Methods.
LO: At the end of this module the student will be able to
   1. Create classes and objects and use real-time interface concepts in the program.
   2. Design and Develop java program using Inheritance OOPS principles.
	8Hours
	
	PO1-3
	PO2-3
	PO3-3
	PO5-3
	PO9-3
	PO12 -3
	PSO1-3
	PSO2-2

	CO4

Module 4
Packages and Exceptions Handling: Packages, Access Protection, Importing Packages.
Exception handling: Exception-Handling Fundamentals, Using try and catch, throw, throws, finally block, Java's Built-in Exceptions, Creating Your Own Exception Subclasses, Chained Exceptions.
LO: At the end of this session the student will be able to
   1. Create and import package from one application to another java application.
   2. Use of Exception handling mechanism to handle errors efficiently.
	8Hours
	
	PO1-3
	PO2-3
	PO3-2
	PO5-3
	PO9-1
	PO12 -3
	PSO1-3
	PSO2-3

Module 5	CO5

Multi-Threaded Programming: The Java Thread Model, The Main Thread, Creating a Thread, Creating Multiple Threads, Using isAlive () and join (), Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming, and Stopping **Threads.**
Enumerations, Type Wrappers and Autoboxing: Using Enum, wrapper class and boxing concepts in real time java applications.
LO: At the end of this session the student will be able to:
   1. Design multi-threaded programs and Apply synchronization concepts.
   2. Designing Autoboxing and unboxing real time application programs using wrapper class.
	8Hours
	
	PO1-3
	PO2-2
	PO3-3
	PO5-3
	PO9-1
	PO12 -1
	PSO1-3
	PSO2-3

Text Books 1. Java: The Complete Reference, Twelfth Edition, by Herbert Schildt, November 2021, McGraw-Hill, ISBN: 9781260463422	
Reference Books 1. Programming with Java, 6th Edition, by E Balagurusamy, Mar-2019, McGraw Hill Education, ISBN: 9789353162337. 2. Thinking in Java, Fourth Edition, by Bruce Eckel, Prentice Hall, 2006 (https://sd.blackball.lv/library/thinking_in_java_4th_edition.pdf).	
Useful Websites 1. Java Tutorial: https://www.geeksforgeeks.org/java/ 2. Introduction To Programming In Java (by Evan Jones, Adam Marcus and Eugene Wu):https://ocw.mit.edu/courses/6-092-introduction to programming- in-java-january-iap-2010/ 3. Java Tutorial: https://www.w3schools.com/java/ 4. Java Tutorial: https://www.javatpoint.com/java-tutorial **Activity Based Learning (Suggested Activities)/ Practical Based learning:** 1. JavaInstallation(Refer:https://www.java.com/en/download/help/index_installing.html) 2. Demonstration of online IDEs like geeksforgeeks, jdoodle or any other Tools. 3. Demonstration of class diagrams for the class abstraction, type visibility, composition and inheritance.	
Useful Journals http://journals.ecs.soton.ac.uk/java/tutorial/java	
Teaching and Learning Methods 1. Lecture class: 40 Hours 2. Practical Lab session: 20 Hours 3. Tutorial class: 15 Hours	
Assessment: CIE for the theory component of the IPCC (maximum marks50) **Type of test/examination:** Written examination **IPCC means practical portion integrated with the theory of the course.** ● CIE marks for the theory component are 25 marks and that for the practical component is 25 marks. ● 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests (Two Tests, each of 15 Marks with 01-hour duration, are to be conducted) and 10 marks for other assessment methods mentioned in 22OB4.2. The first test at the end of 40-50% coverage of the syllabus and the second test after covering 85-90% of the syllabus.	

- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for 25 marks).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

Assessment: CIE for the practical component of the IPCC

- 15 marks for the conduction of the experiment and preparation of laboratory record, and 10 marks for the test to be conducted after the completion of all the laboratory sessions.
- On completion of every experiment/program in the laboratory, the students shall be evaluated including viva-voce and marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (duration 02/03 hours) after completion of all the experiments shall be conducted for 50 marks and scaled down to 10 marks.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for 25 marks.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

Test duration: 1 :30 Hours

Examination duration: 3 Hours

CO to PO Mapping

PO1: Science and Engineering Knowledge	**PO7:** Environment and Society
PO2: Problem Analysis	**PO8:** Ethics
PO3: Design & Development	**PO9:** Individual & Team Work
PO4: Investigations of Complex Problems	**PO10:** Communication
PO5: Modern Tool Usage	**PO11:** Project Mgmt.& Finance
PO6: Engineer & Society	**PO12:** Lifelong Learning

PSO-1 : Comprehend fundamental and advanced concepts within the core domains of Computer Science to analyze, design and implement optimal solutions for real-world challenges.

PSO-2 : Grasp business principles and employ the latest technologies to address business challenges effectively.

CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
BCS306A	K-lev el														
CO1	K4	3	2	1	-	1	-	-	-	1	-	-	3	3	1
CO2	K2	3	3	1	-	1	-	-	-	1	-	-	2	3	1
CO3	K3	3	3	3	-	3	-	-	-	1	-	-	3	3	2
CO4	K3	3	3	2	-	3	-	-	-	1	-	-	3	3	3
CO5	K2	3	2	3	-	3	-	-	-	1	-	-	1	3	3

Course Incharge

Head of the Department

Principal

Course: Digital Design and Computer Organisation				
Type: Professional Core Course			**Course Code: BCS302**	
No of Hours				
Theory (Lecture Class)	Tutorials	Practical/Field Work/Allied Activities	Total/Week	Total hours of Pedagogy
3	0	2	5	40 T + 20 P
Marks				
CIE	SEE		Total	Credits
50	50		100	4

Aim/Objectives of the Course

- To demonstrate the functionalities of binary logic system
- To explain the working of combinational and sequential logic system
- To realize the basic structure of computer system
- To illustrate the working of I/O operations and processing unit

Course Learning Outcomes
After completing the course, the students will be able to

CO1	Apply the K–Map techniques to simplify various Boolean expressions.	Applying (K3)
CO2	Design different types of combinational and sequential circuits along with Verilog programs.	Applying (K3)
CO3	Describe the fundamentals of machine instructions, addressing modes and Processor performance.	Understand (K2)
CO4	Explain the approaches involved in achieving communication between processor and I/O devices.	Understand (K2)
CO5	Analyze internal Organization of Memory and Impact of cache/Pipelining on Processor Performance.	Applying (K3)

Syllabus Content

	CO1
Introduction to Digital Design: Binary Logic, Basic Theorems And Properties Of Boolean Algebra, Boolean Functions, Digital Logic Gates, Introduction, The Map Method, Four-Variable Map, Don't-Care Conditions, NAND and NOR Implementation, Other Hardware Description Language – Verilog Model of a simple circuit. **LO:** At the end of this session the student will be able to demonstrate the functionalities of binary logic system.	8 hrs PO1-3 PO2-3 PO3-1 PO5-3 PO8-2 PO12 -1 PSO1-2 PSO2-2

	CO2 8 hrs.
MODULE 2 : Combinational Logic: Introduction, Combinational Circuits, Design Procedure, Binary Adder- Subtractor, Decoders, Encoders, Multiplexers. HDL Models of Combinational Circuits – Adder, Multiplexer, Encoder. **Sequential Logic:** Introduction, Sequential Circuits, Storage Elements: Latches, Flip-Flops. **LO:** At the end of this session the student will be able to: 1. explain the working of combinational and sequential logic system 2. draw logical circuit diagrams for SOP and POS equations	PO1-3 PO2-3 PO3-2 PO5-3 PO8-2 PO9-3 PO12-1 PSO1-2 PSO2-2
MODULE 3: Basic Structure of Computers: Functional Units, Basic Operational Concepts, Bus structure, Performance - Processor Clock, Basic Performance Equation, Clock Rate, Performance Measurement. **Machine Instructions and Programs:** Memory Location and Addresses, Memory Operations, Instruction and Instruction sequencing, Addressing Modes. **LO:** At the end of this session the student will be able to 1. realize the basic structure of computer system 2. differentiate between various memory addressing modes	CO3 8 hrs PO1-2 PO2-2 PO3-1 PO8-1 PO12-1 PSO1-2 PSO2-2
MODULE 4: Input/output Organization: Accessing I/O Devices, Interrupts - Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access: Bus Arbitration, Speed, size and Cost of memory systems. Cache Memories – Mapping Functions. **LO:** At the end of this session the student will be able to 1. specify the interrupts and interrupt handling	CO4 8 hrs PO1-2 PO2-2 PO3-2 PO8-1 PO12-1 PSO1-2 PSO2-2
MODULE 5: **Basic Processing Unit:** Some Fundamental Concepts: Register Transfers, Performing ALU operations, fetching a word from Memory, Storing a word in memory. Execution of a Complete Instruction. **Pipelining:** Basic concepts, Role of Cache memory, Pipeline Performance. **LO:** At the end of this session the student will be able to 1. illustrate the working of I/O operations and processing unit	CO5 8hrs PO1-2 PO2-3 PO3-2 PO8-2 PO12-1 PSO1-2 PSO2-2

Text Books

1. M. Morris Mano & Michael D. Ciletti, Digital Design With an Introduction to Verilog Design, 5e, Pearson Education.
2. Carl Hamacher, ZvonkoVranesic, SafwatZaky, Computer Organization, 5th Edition, Tata McGraw Hill.

Useful Websites
- **https://cse11-iiith.vlabs.ac.in/**

Teaching and Learning Methods

1. Lecture class: 40 hrs

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of the IPCC (maximum marks 50)
- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are **25 marks** and that for the practical component is **25 marks**.
- 25 marks for the theory component are split into **15 marks** for two Internal Assessment Tests (Two Tests, each of 15 Marks with 01-hour duration, are to be conducted) and **10 marks** for other assessment methods mentioned in 22OB4.2. The first test at the end of 40-50% coverage of the syllabus and the second test after covering 85-90% of the syllabus.
- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for **25 marks**).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

CIE for the practical component of the IPCC
- **15 marks** for the conduction of the experiment and preparation of laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.
- On completion of every experiment/program in the laboratory, the students shall be evaluated including viva-voce and marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to **15 marks**.
- The laboratory test **(duration 02/03 hours)** after completion of all the experiments shall be conducted for 50 marks and scaled down to **10 marks.**
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **25 marks.**
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

SEE for IPCC

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course **(duration 03 hours)**
1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.
4. Marks scored by the student shall be proportionally scaled down to 50 Marks

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper may include questions from the practical component.
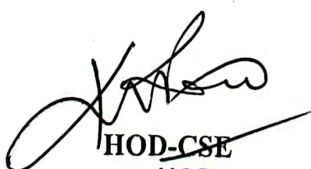
CO to PO Mapping

PO1: Science and engineering Knowledge	PO7: Environment and Society
PO2: Problem Analysis	PO8: Ethics
PO3: Design & Development	PO9: Individual & Team Work
PO4: Investigations of Complex Problems	PO10: Communication
PO5: Modern Tool Usage	PO11: Project Mgmt. & Finance
PO6: Engineer & Society	PO12: Lifelong Learning

PSO1: Understand fundamental and advanced concepts in the core areas of Computer Science and Engineering to analyze, design and implement the solutions for the real world problems.

PSO2: Utilize modern technological innovations efficiently in various applications to work towards the betterment of society and solve engineering problems.

CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
BCS302	K-level														
CO1	K3	3	3	1	-	3	-	-	2	-	-	-	-	2	2
CO2	K3	3	3	2	-	3	-	-	2	3	-	-	-	2	2
CO3	K3	2	2	1	-	-	-	-	1	-	-	-	-	2	1
CO4	K3	2	2	2	-	-	-	-	1	-	-	-	-	2	1
CO5	K3	2	3	2	-	-	-	-	2	-	-	-	-	2	1

Course In charge

HOD-CSE
HOD
Department of Computer Science Engineering
K.S School of Engineering & Management
Bangalore-560109

IQAC Coordinator

Principal
Dr. K. RAMA NARASIMHA
Principal/Director
K S School of Engineering and Manage
Bengaluru - 560 109

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BENGALURU - 560109
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SESSION: 2023-24 (ODD SEMESTER)
CO-PO MAPPING

Course Title: Computer Communication Networks			
Type: Core		Course Code: 18EC71	

No of Hours			
Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total hours/Week	Total teaching hours
3	3	4	40

Marks			
Internal Assessment	Examination	Total	Credits
40	60	100	3

Aim/Objectives of the Course

1. Understand the layering architecture of OSI reference model and TCP/IP protocol suite.
2. Understand the protocols associated with each layer.
3. Learn the different networking architectures and their representations.
4. Learn the functions and services associated with each layer.

Course Learning Outcomes
After completing the course, the students will be able to

CO1	Make use of OSI/TCPIP models to understand the basic communication in networks	Applying (K3)
CO2	Make use of appropriate DLL protocols to access the channel	Applying (K3)
CO3	Apply the wireless standards, understand the characteristics of connecting devices and IP addressing	Applying (K3)
CO4	Make use of transport layer protocols for different services	Applying (K3)
CO5	Utilize various Application Layer protocols for different services	Applying (K3)

Syllabus Content

Module 1: Introduction: Data communication: Components, Data representation, Data flow, Networks: Network criteria, Physical Structures, Network types: LAN, WAN, Switching, The Internet.
Network Models: Protocol Layering: Scenarios, Principles, Logical Connections, TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite, Description of layers, Encapsulation and Decapsulation, Addressing, Multiplexing and Demultiplexing, The OSI Model: OSI Versus TCP/IP.
LO: At the end of this session the student will be able to
  1. Identify the five components of a data communication system
  2. Explain the four network topologies and network types.
  3. Demonstrate the significance of TCP/IP Protocol Suite and OSI Model.
	CO1
	
	8 Hrs
	
	PO1-2
	PO2-1
	PO3-1
	PO10-1
	PO12 -1
	PSO1-3
	PSO2-1

Module 2: Data-Link Layer: Introduction: Nodes and Links, Services, Two Categories' of link, Sublayers,Link Layer addressing: Types of addresses, ARP. Data Link Control (DLC) services: Framing,Flow and Error Control, Data Link Layer Protocols: Simple Protocol, Stop and Wait protocol,Piggybacking. **Media Access Control:** Random Access: ALOHA, CSMA, CSMA/CD, CSMA/CA. **Wired and Wireless LANs:** Ethernet Protocol, Standard Ethernet. Introduction to wireless LAN: Architectural Comparison, Characteristics, Access Control.
 	
LO: At the end of this session the student will be able to
  1. Explain ALOHA, CSMA, CSMA/CD, CSMA/CA Random access methods.
  2. Illustrate the IEEE frame format and characteristics of standard Ethernet.
  3. Compare the data rates for standard Ethernet, fast Ethernet,giga bit Ethernet,
  4. Explain the MAC Sublayer and physical layer of Gigabit Ethernet
  5. Compare the architecture of wired and wireless LANs and list the Characteristics of wireless LANs.
	CO2
	8 Hrs.
	
	PO1-2
	PO2-3
	PO3-2
	PO4-2
	PO5-1
	PO10-1
	PO12-2
	PSO1-3
	PSO2-2

Module 3: Network Layer: Introduction, Network Layer services: Packetizing, Routing and Forwarding, Other services, Packet Switching: Datagram Approach, Virtual Circuit Approach, IPV4 Addresses: Address Space, Classfull Addressing, Classless Addressing, DHCP, Network Address Resolution, Forwarding of IP Packets: Based on destination Address and Label. **Network Layer Protocols:** Internet Protocol (IP): Datagram Format, Fragmentation, Options, Security of IPv4 Datagrams. **Unicast Routing:** Introduction, Routing Algorithms: Distance Vector Routing, Link State Routing, Path vector routing.
 	
LO: At the end of this session the student will be able to
  1. List the five different types of connecting devices and explain them briefly
  2. Illustrate the services provided by network layer and IPV4 addressing
  3. Describe the datagram format, fragmentation and security of IPv4 Datagrams
  4. Explain the general format of ICMP messages.
  5. Discuss the different unicast routing algorithms and routing protocols
	CO3
	8 Hrs
	
	PO1-2
	PO2-2
	PO3-3
	PO4-2
	PO10-1
	PO12-2
	PSO1-3
	PSO2-2

Transport Layer: Introduction: Transport Layer Services, Connectionless and Connection oriented Protocols, Transport Layer Protocols: Simple protocol, Stop and wait protocol, Go-Back- N Protocol, Selective repeat protocol. **Transport-Layer Protocols in the Internet:** User Datagram Protocol: User Datagram, UDP Services, UDP Applications, Transmission Control Protocol: TCP Services, TCP Features, Segment, Connection, State Transition diagram, Windows in TCP, Flow control, Error control, TCP congestion control.
 	
LO: At the end of this session the student will be able to
  1. Distinguish the connectionless and connection-oriented service represented as FSMs for transport layer.
  2. List and explain the different types of transport layer protocols
  3. Describe the user datagram protocol, services and its applications
  4. Discuss what are the different TCP services and features
	CO5
	8 hrs
	
	PO1-2
	PO2-3
	PO3-2
	PO4-2
	PO5-1
	PO10-1
	PO12-2
	PSO1-3
	PSO2-2

	CO4
Module 5: Introduction: providing services, Application- layer paradigms, Standard Client –Server Protocols: World wide web, Hyper Text Transfer Protocol, FTP: Two connections, Control Connection, Data Connection, Electronic Mail: Architecture, Wed Based Mail, Telnet: Local versus remote logging. Domain Name system: Name space, DNS in internet, Resolution, DNS Messages, Registrars, DDNS, security of DNS. **LO:** At the end of this session the student will be able to 1. Understand Application layer paradigm 2. Understand different application layer protocols 3. Describe the Email Architecture	8 hrs PO1-2 PO2-3 PO3-1 PO4-2 PO5-1 PO10-1 PO12-2 PSO1-3 PSO2-2

Text Books

1. Forouzan, **"Data Communications and Networking"**, 5th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3.

Reference Books

1. James J Kurose, Keith W Ross, **"Computer Networks"**, Pearson Education, 2013, ISBN: 0-273-76896-4

2. WayarlesTomasi , **"Introduction to Data Communication and Networking"**, Pearson Education, 2007, ISBN:0130138282

Useful Websites

- W1 www.nptel.ac.in

- W2 http://www.mhhe.com/engcs/compsci/forouzan/

- W3https://www.academia.edu/31758087/FIFTH_EDITION_Data_Communications_AND_Networking

Useful Journals
- International Journal of Computer Networks (IJCN)
- **IEEE** International Journal of Communication networks and information security.

Teaching and Learning Methods

1. Lecture class: 50 hours

2. Practical classes: 3 hours

Assessment
Type of test/examination: Written examination

Continuous Internal Evaluation(CIE) :

18EC71: 40 marks (30 marks -Average of three tests + 10 marks Assignments)

Semester End Exam (SEE): 100 marks (students have to answer all main questions) which will be reduced to 60Marks (18EC71)

Test duration: 1 :30 hours
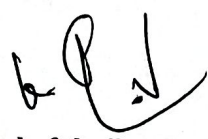
Examination duration: 3 hours

CO to PO Mapping

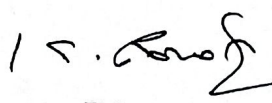|	
PO1: Science and engineering Knowledge	**PO7:** Environment and Sustainability
PO2: Problem Analysis	**PO8:** Ethics
PO3: Design & Development	**PO9:** Individual & Team Work
PO4: Investigations of Complex Problems	**PO10:** Communication
PO5: Modern Tool Usage	**PO11:** Project Management & Finance
PO6: Engineer & Society	**PO12:** Life long Learning

PSO1: Be able to acquire knowledge and apply concepts in the field of engineering and interdisciplinary subjects.

PSO2: Be able to identify the existing problems, effectively utilize tools to provide solution, and disseminate the information.

CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 1	PSO 2
18EC 71	K-level														
CO1	K3	2	1	1	-	-	-	-	-	-	1	-	1	3	1
CO2	K3	2	3	2	2	1	-	-	-	-	1	-	2	3	2
CO3	K3	2	2	3	2	-	-	-	-	-	1	-	2	3	2
CO4	K3	2	3	1	1	1	-	-	-	-	1	-	2	3	2
CO5	K3	2	3	2	2	1	-	-	-	-	1	-	2	3	2

Course In charge   Head of the Department   Principal

Professor & Head
Dept of Electronics & Communication Engineering
K.S. School of Engineering & Management
Bangalore - 560 109

Dr. K. RAMA NARASIM
Principal/Director
K S School of Engineering and M
Bengaluru - 560 109

Course: ADDITIVE MANUFACTURING	
Type: Core	Course Code: 18ME741

No of Hours

Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total hours/Week	Total teaching hours
3	0	3	40

Marks

Internal Assessment	Examination	Total	Credits
40	60	100	3

Aim/Objectives of the Course

1. To know the principle methods, areas of usage, possibilities and limitations of the Additive Manufacturing technologies.
2. To be familiar with the characteristics of the different materials those are used in Additive Manufacturing.
3. To know the principles of polymerization and powder metallurgy process, extrusion-based system printing processes, sheet lamination processes, beam deposition processes, direct write technologies and Direct Digital Manufacturing.
4. To get exposed to process selection, software issues and post processing.

Course Learning Outcomes

After completing the course, the students will be able to

CO1	Summarize Terminologies in the Additive Manufacturing.	K2 (Understanding)
CO2	Explain the concepts of Stereolithography, Power bed fusion and extrusion based processes.	K2 (Understanding)
CO3	Describe various printing process and its applications	K2 (Understanding)
CO4	Elaborate guidelines on process selection in AM and its software issues	K2 (Understanding)
CO5	Illustrate the applications of AM and explains the post processing methodologies in AM techniques	K2 (Understanding)

Syllabus Content

Module 1:

Introduction and basic principles: Need for Additive Manufacturing; Generic AM process, Stereolithography or 3D printing, rapid proto typing, the benefits of AM, distinction between AM and CNC machining, other related technologies- reverse engineering technology. **Development of Additive Manufacturing Technology:** Introduction, computers, computer-aided design technology, other associated technologies, the use of layers, classification of AM processes, metal systems, hybrid systems, milestones in AM development. **Additive Manufacturing Process chain:** Introduction, the eight steps in additive manufacture, variations from one AM machine to another ,metal systems, maintenance of equipment, materials handling issues, design for AM and application	**CO1** 10 hrs. PO1-3 PO3-2 PO5-1 PO6-1 PO7-1 PO12-1 PSO1-3 PSO-1

areas.

LO: After competing this unit the student will be able to
1. Explain the AM Process
2. Differentiate between AM & CNC
3. Classify AM Process
4. Write and explain the applications of AM process.

Module 2:	

Photo polymerization processes: Stereolithography (SL), Materials, SL resin curing process, Micro-Stereolithography, Process Benefits and Drawbacks, Applications of Photo polymerization Processes.
Powder bed-fusion processes: Introduction, Selective laser Sintering (SLS), Materials, Powder fusion mechanism, SLS Metal and ceramic part creation, Electron Beam melting (EBM), Process Benefits and Drawbacks, Applications of Powder Bed Fusion Processes.
Extrusion-based systems: Fused Deposition Modelling (FDM), Principles, Materials, Plotting and path control, Bio-Extrusion, Process Benefits and Drawbacks, Applications of Extrusion-Based Processes.
LO: After competing this unit the student will be able to
    1. Explain different SL Process
    2. Describe Sintering and Powder fusion processes
    3. Explain FDM and its applications
	CO2
	
	10 hrs
	
	PO1-3
	PO3-2
	PO5-1
	PO6-1
	PO7-1
	PO12-1
	PSO1-3
	PSO-1

Module 3:	

Printing Processes: evolution of printing as an additive manufacturing process, research achievements in printing deposition, technical challenges of printing, printing process modelling, material modification methods, three-dimensional printing, advantages of binder printing
Sheet Lamination Processes: Materials, Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC), Gluing, Thermal bonding, LOM and UC applications.
Beam Deposition Processes: introduction, general beam deposition process, description material delivery, BD systems, process parameters, typical materials and microstructure, processing–structure–properties relationships, BD benefits and drawbacks.
Direct Write Technologies: Background, ink –based DW, laser transfer, DW thermals pray, DW beam deposition, DW liquid-phase directed position.
LO: After competing this unit the student will be able to
    1. Explain the process of printing processes
    2. Illustrate LOM & Beam deposition process
	CO3
	
	PO1-3
	PO3-2
	PO5-1
	PO6-1
	PO7-1
	PO12-1
	PSO1-3
	PSO-1

Module 4:	

Guidelines for Process Selection: Introduction, selection methods for apart, challenges of selection, example system for preliminary selection, production planning and control.
Software issues for Additive Manufacturing: Introduction, preparation of cad models – the STL file, problems with STL files, STL file manipulation.
Post- Processing: Support material removal, surface texture improvements, Preparation for use as a pattern, property enhancements using non-thermal techniques and thermal techniques.
LO: After competing this unit the student will be able to
    1. Explain Post Processing of AM Parts
    2. Identify the difficulties in AM software
	CO4
	
	10 hrs
	
	PO1-3
	PO3-2
	PO5-1
	PO6-1
	PO7-1
	PO12-1
	PSO1-3
	PSO-1

Module 5:	

The use of multiple materials in additive manufacturing: Introduction, multiple material approaches, discrete multiple material processes, porous multiple material processes, blended multiple material processes, commercial applications using multiple materials, future directions.
AM Applications: Functional models, Pattern for investment and vacuum casting, Medical models, art models, Engineering analysis models, Rapid tooling, new materials development, Bi-metallic parts, Remanufacturing. Application: Examples for Aerospace, defense, automobile, Bio-medical and general Engineering industries.
Direct digital manufacturing: Align Technology, siemens and phonak, DDM drivers, manufacturing vs. prototyping, life- cycle costing, future of direct digital manufacturing.
LO: After competing this unit the student will be able to
   1. Write and explain the applications of AM process
   2. Explain DDM
	CO5
	
	10 hrs
	
	PO1-3
	PO3-2
	PO5-1
	PO6-1
	PO7-1
	PO12-1
	PSO1-3
	PSO-1

Text Books
1. Gibson l D., W. Rosen l B, Stucker, "Additive Manufacturing Technologies Rapid Prototyping to Direct Digital Manufacturing", Springer New York Heidelberg Dordrecht, London, ISBN: 978-1-4419-119-3, e-ISBN: 978-1-4419-1120-9, DOI10.1007/978-1-4419-1120-9.

REFERENCE BOOKS:
1. Chua Chee Kai, Leong Kah Fai, "Rapid Prototyping: Principles & Applications", World Scientific, 2003.
2. D.T. Pham, S.S, Dimov, "Rapid Manufacturing: The Technologies and Applications of Rapid Prototyping and Rapid Tooling", Springer, 2001.

Useful Websites & Journals :
1. https://www.google.co.in/books/edition/Additive Manufacturing Technologies and/vFxjDwAAQBAJ?hl=en&gbpv=1&dq=additive+manufacturing+text+book+pdf+download&printsec=frontcover.
2. https://www.journals.elsevier.com/additive-manufacturing
3. https://www.google.co.in/books/edition/Automation Production Systems and Comput/0l4BugEACAAJ?hl=en

Teaching and Learning Methods

1. Lecture class: 40 hours

2. Practical classes: 0 hours

Assessment
Type of test/examination: Written examination

Continuous Internal Evaluation(CIE) : 40 marks (30 marks -Average of three tests + 10 marks Assignments)

Semester End Exam (SEE): 100 marks (students have to answer all main questions) which will be reduced to 60 Marks.

Test duration: 1 :30 hours

Examination duration: 3 hours

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CO to PO Mapping

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PO1: Science and engineering Knowledge	PO7:Environment and Society
PO2: Problem Analysis	PO8:Ethics
PO3: Design & Development	PO9:Individual& Team Work
PO4:Investigations of Complex Problems	PO10: Communication
PO5: Modern Tool Usage	PO11:ProjectMngmt& Finance
PO6: Engineer & Society	PO12:Lifelong Learning

PSO1: Ability to apply concept of mechanical engineering to design a system, a component or a process/system to address a real-world challenge

PSO2: Ability to develop effective communication, team work, entrepreneurial and computational skills

CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
18ME 741	K-level														
CO1	K2	3	-	2	-	1	1	1	-	-	-	-	1	3	1
CO2	K2	3	-	2	-	1	1	1	-	-	-	-	1	3	1
CO3	K2	3	-	2	-	1	1	1	-	-	-	-	1	3	1
CO4	K2	3	-	2	-	1	1	1	-	-	-	-	1	3	1
CO5	K2	3	-	2	-	1	1	1	-	-	-	-	1	3	1

Course In charge

Head - Dept.

Principal

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
DEPARTMENT OF MANAGEMENT STUDIES
Session: 2023-24 (ODD Semester), I SEM MBA, Batch 2023-25
CO-PO Mapping

Course: ACCOUNTING FOR MANAGEMENT			
Type: CORE		Course Code: 22MBA13	
No of Hours			
Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total/Week	Total teaching hours
3	2	5	52
Marks			
Internal Assessment	Examination	Total	Credits
50	50	100	4

Aim/Learning Objectives of the Course

1. To explain fundamental accounting concepts, the elements of financial statements, and basic accounting vocabulary.
2. To enable the students to understand the conceptual framework of accounting, reporting and elements of financial statements.
3. To enable the students in preparation of books of accounts and accounting records leading to final accounts and interpretation there-off.
4. To acquaint the students with interpretation of accounting information and analyses of financial statements for decision making.
5. To enable students in preparation of Bank Reconciliation Statement.
6. To enable the students in preparation of Depreciation Calculation, understanding basic framework of Direct Taxation and Emerging issues in Accounting.

Course Learning Outcomes
After completing the course, the students will be able to:

CO1	**Demonstrate** theoretical knowledge and it's application in real time accounting	Remembering (K1)
CO2	**Capable of preparing** (Know and how) books of accounts of companies.	Applying (K3)
CO3	**Capable of Preparing** Financial Statement s of Companies	Applying (K3)
CO4	**Analyse** Independently undertake financial statement analysis and take decisions.	Analyzing and Creating (K4, K6)
CO5	**Analyse and Understand** Bank Reconciliation Statement.	Analyzing and Creating (K4, K6)
CO6	**Comprehend** emerging trends in accounting, Depreciation, Direct Taxation and computerization of accounting systems.	Analyzing and Creating (K4, K6)

Syllabus Content

Module 1: (7 Hours) Introduction to Accounting: Meaning and Objectives, Need and Types of Accounting, Single Entry System, Double Entry System, Basics of Generally Accepted Accounting Principles (GAAP), IFRS, Indian Accounting Standards. Concepts and Conventions of Accounting. (Theory only)	CO1 07 hrs

LO: At the end of this session the student will be able to 1. **Describe** the types of accounting. 2. **Distinguish** between Capital Revenue and Capital Expenditures. 3. **Write** short note on Concepts of Accounting. 4. **Describe** Conventions of Accounting? 5. **Define** Double Entry System?	
Unit 2: (9 Hours) Accounting Cycle: Journal, Ledgers, Trial balance, Accounting equation, Users of Accounting information, subsidiary books including cash book with two and three-column cashbook only. (Theory and Problems). **LO:** At the end of this session the student will be able to 1. Define term Journal and Ledger? 2. Express the distinction between Two column cash book and three column cash books. 3. List the users of accounting information. 4. Distinguish between Balance Sheet and Trial balance?	**CO2** 9 hrs. PO3 , PSO2
Unit 3: (9 Hours) Final Accounts of companies: Preparation of final accounts of companies in vertical form as per Companies Act of 2013 (Problems of Final Accounts with adjustments), Window dressing. Case Study problem on Final Accounts of Company-Appropriation accounts. (Theory and Problems). **LO:** At the end of this session the student will be able to 1. Define Window Dressing? 2. Determine the distinction between Balance Sheet and P&L account. 3. Discuss the forms of Window Dressing. 4. Define Balance Sheet?	**CO3** 9 hrs PO3 , PSO2
Unit 4: (9 Hours) Analysis of Financial Statements: Meaning and Purpose of Financial Statement Analysis, Trend Analysis, Comparative Analysis, Financial Ratio Analysis, Preparation of Financial Statements using Financial Ratios, Case Study on Financial Ratio Analysis. Preparation of Cash flow Statement (Indirect method). Lab compulsory for Financial Statement Analysis using Excel. (Theory and Problems). **LO:** At the end of this session the student will be able to 1. Outline the meaning of PV ratio 2. Discuss the importance of Cash Flow Statement. 3. Explain the Comparative Balance Sheet benefits.	**CO4** 9hrs PO4,PSO3
Unit 5: (6 Hours) Bank Reconciliation Statement: Rules for recording Receipts and Payments in the cash book and bank passbook, reasons for differences in the balances of cash book and bank pass book. Meaning and Preparation of Bank reconciliation statement with Tally. (Theory and Problems). **LO:** At the end of this session the student will be able to 1. Explain the Bank Reconciliation Statement benefits. 2. Distinction between Receipts and Payments in Cash Book. 3. Discuss the importance of Functional Budgets.	**CO5** 6 hrs PO4,PSO3

Unit 6: (10 Hours) Depreciation and Emerging Issues in Accounting: Depreciation: Meaning, characteristics and causes of depreciation, Types of Depreciation. Tax implication of depreciation. (Problems only on straight line and WDV method). **Direct Taxation:** Basic Concepts and definitions, Capital and revenue – receipts, expenditures, Basis of charge and scope of total income, Tax Planning, Tax Evasion and Tax Management, (Theory Only). **Emerging Issues in Accounting:** Human Resource Accounting, Forensic Accounting, Green Accounting, Sustainability Reporting. (Theory only). **LO:** At the end of this session the student will be able to 1. Discuss the Forensic Accounting. 2. How do you calculate Human Resource Accounting? 3. Write short note on Indian Accounting Standards. 4. What is Computerized Accounting.	CO-6 10 hrs PO4,PSO3

Suggested Learning Resources:
Text Books

1. Financial Accounting: A Managerial Perspective, Narayanaswamy R, 5/e, PHI, 2014.
2. Accounting for Management-Text & Cases , S.K. Bhattacharya & John Dearden , Vikas Publishing House Pvt. Ltd, 3e, 2018
3. Financial Accounting, S .N. Maheshwari, Suneel K. Maheshwari, Sharad K. Maheshwari, Vikas Publishing House Pvt. Ltd, 6e, 2018
4. Computerized Accounting, Neeraj Goyal, Rohit Sachdeva, Kalyani Publishers , 1e, 2018

Reference Books (specify minimum two foreign authors text books)

1. Financial Accounting, Jain S. P and Narang K L, Kalyani Publishers.
2. Direct Taxes Law and practice, Vinod Singhania and Kapil Singhania, Taxman Publications
3. Accounting and Finance for Non-finance Managers, Jai Kumar Batra, Sage Publications, 1e, 2018

Web Links abd Video Lectures (e-Resources):
https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-5New.pdf
https://journals.sagepub.com/home/jaf
https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Inter-Paper5-Revised.pdf
https://books.mec.biz/tmp/books/Y3BMTIHRR2UE7LMTZG3T.pdf
https://drnishikantjha.com/booksCollection/Financial%20Accounting%20-%20BMS%20.pdf
https://www.pdfdrive.com/accountancy-books.html
https://onlinecourses.swayam2.ac.in/nou22_cm18/preview
https://www.coursera.org/lecture/uva-darden-financial-accounting/what-is-accounting-eXQEc
https://www.youtube.com/watch?v=mq6KNVeTE3A

Useful Journals
- Journal of Accounting Research
- Journal of Accounting and Economics
- Review of Accounting studies
- Journal of Accounting and Public Policy

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109

DEPARTMENT OF MANAGEMENT STUDIES

CO-PO Mapping

- Journal of Accounting, Auditing and Finance

Teaching and Learning Methods

1. Lecture class: 44 hrs
2. Practical classes: 08 hrs

   Question Paper: 30 % Theory 70% problems

Assessment

Type of test/examination: Written examination

Continuous Internal Evaluation(CIE) :

1. Three tests each of 50 marks for 1 hour & 30 minutes (Average of THREE tests will be considered for 25 Marks)
2. Three assignments for 15 Marks each.
3. Group Discussion/ Seminar/ Quiz/ Class Participation/ subject viva for 10 Marks

Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Exam (SEE): 100 marks (students have to answer all main questions) which will be reduced to 50 Marks.

Test duration: 1 :30 hrs

Examination duration: 3 hrs

PROGRAM OUTCOMES

PO1: Apply knowledge of management theories and practices to solve business problems.

PO2: Foster analytical and critical thinking abilities for data-based decision making.

PO3: Ability to develop value-based leadership.

PO4: Ability to understand, analyse and communicate global, economic, legal and ethical aspects of the business.

PO5: Ability to lead themselves and others in the achievement of organizational goals contributing effectively to a team environment.

PROGRAM SPECIFIC OUTCOMES (PSOs):

The postgraduate students of the department shall be able to

PSO1) Comprehend the contemporary features and characteristics of Business Management Science and its administration.

K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE – 560109
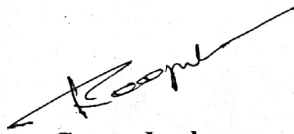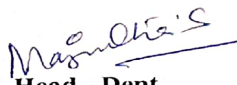## DEPARTMENT OF MANAGEMENT STUDIES
CO-PO Mapping

PSO2) Analyse and interpret the dynamic situations for making Business Management strategies and decisions at the national and global level.

PSO3) Handle responsibility with the ethical values for all actions undertaken by them.

PSO4) Adapt and focus on achieving the organisational goal and objectives with complete zeal and commitment.

CO		PO					PSO			
		PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
20MBA13	K- Level	-	-	-	-	-	-	-	-	-
CO1	K1	1	-		-	2	3			
CO2	K3			2	-	-		2		
CO3	K3			2	-	-		2		
CO4	K4,K6				3	-			2	
CO5	K4,K6				3	-			2	
CO6	K4,K6			-	3	-			2	

Course In charge   Head – Dept   IQAC Coordinator   Principal