Course Outcome

Session 2020-21

Department of Computer Science & Information Technology

Index

3rd Semester		
S No.	**Subject Code**	**Subject Name**
1	KAS-302	Maths IV
2	KAS-301	Technical Communication
3	KCS-301	Data Structure
4	KCS-302	Computer Organization and Architecture
5	KCS-303	Discrete Structures & Theory of Logic
6	KNC-301	Computer System Security
7	KCS-351	Data Structures Using C Lab
8	KCS-352	Computer Organization Lab
9	KCS-353	Discrete Structure & Logic Lab
10	KCS-354	Mini Project or Internship Assessment

5th Semester		
S No.	**Subject Code**	**Subject Name**
1	KCS 055	Machine Learning Techniques
2	KNC 502	Indian Tradition, Culture and Society
3	KCS 501	Database Management Systems
4	KCS 503	Design And Analysis Of Algorithm
5	KCS 054	Object Oriented System Design
6	KIT 501	Web Technologies
7	KCS 551	Database Management Systems Lab
8	KCS 553	Design and Analysis of Algorithm Lab
9	KIT 551	Web Technologies Lab

CO PO and Mapping of CO PO 2nd Year

(2019-2023 BATCH)

Session:- 2020-21 Semester:- 3rd

S.No.	Subject	Code
1	Math-IV	KAS 302
2	Technical Communication	KAS 301
3	Data Structure	KCS 301
4	Computer Organization and Architecture	KCS 302
5	Discrete Structures & Theory of Logic	KCS 303
6	Computer System Security	KNC 301
7	Data Structures Using C Lab	KCS351
8	Computer Organization Lab	KCS352
9	Discrete Structure & Logic Lab	KCS353
10	Mini Project or Internship Assessment	KCS354

Theory

Mathematics -IV (KAS 302)	CO1	Identify the application of partial differential equations and apply for solving linear and non-linear partial differential equation.	K1,K3
	CO2	Understand the classification of second order partial differential equations and by using the method of separation of variables to evaluate the general solution of	K1,K3
	CO3	Remember the concept of moments, skewers, moment generating function, curve fitting and analyze the correlation and regression.	K1,K4
	CO4	Remember the concept of probability, random variable and apply for solving the problem related to discrete and continuous probability distributions.	K1,K3
	CO5	Understand the statistical method of data samples , hypothesis testing and applying the study of control chart and their properties.	K2,K3

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	3	2	3	2						3	2
CO2	3	3	3	3	2	3	1				1	3	3	3
CO3	3	3	2	2	3	3	1				1	3	3	2
CO4	3	3	3	2	3	3	2				2	3	3	2
CO5	3	3	3	3	3	3	1				1	3	3	3

Technical Communication (KAS301)	CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.	K1,K2
	CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K3
	CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K3
	CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence	K6
	CO5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K5

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1						1	1	1	2	2	2	2	2	1
CO2								1	1	3	3	2	1	2
CO3								1	2	3	2	2	1	1
CO4						2	1		1	3	2	3	2	2
CO5									2	3	1	1	1	1

Data Structures (KCS 301)	CO1	Understand the complexity of algorithms by Describing various data structures and their representations in memory with their common applications.	K1,K2
	CO2	Describe the concept of recursion and implement various data structures like stack, queue, list, tree, and graph using static and dynamic memory allocations.	K2,K3
	CO3	Study and Apply various searching and sorting algorithms on different data structures.	K3
	CO4	Analyze the algorithmic implementation of non-linear data structures such as searching and sorting by comparing their computational efficiency.	K4
	CO5	Evaluate the alternate data structures algorithm with respect to its performance to solve a real-world problem.	K5,K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	2	1	1	1	1	1	1	1	2	3	3
CO2	3	3	2	2	2	1	1	1	1	1	1	2	3	3
CO3	3	3	2	3	2	1	1	1	1	1	1	2	3	3
CO4	3	3	2	3	2	2	1	1	1	1	1	2	3	3
CO5	3	3	3	3	2	2	1	1	2	2	2	3	3	3

Computer Organization and Architecture (KCS 302)	CO1	Understand and describe the basic organization and operation of the components of a digital computer system.	K1,K2
	CO2	Illustrate various arithmetic and logical operations on different types of numbers to design an arithmetic and logic unit.	K3
	CO3	Analyze the performance issues of the processor and classify the control unit implementation techniques.	K4
	CO4	Categorize the hierarchical memory system and examine the virtual memory implementation techniques.	K3,K4
	CO5	Compare the different I/O data transfer techniques, and describe the different ways of communication among I/O devices and standard I/O interfaces	K2,K5

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	1	2	1	1	1	1		1	1	3	3
CO2	3	3	3	1	3	1			1		1	1	3	3
CO3	2	2	2	1	3	1			1		1	1	3	3
CO4	2	2	2	1	1	1			1		1	1	3	3
CO5	2	2	2	1	1	1			1		1	1	3	3

Discrete Structure and Theory of Logic (KCS-303)	CO1	Acquire Knowledge of Logical Notations which is used to define and understand the basic fundamental mathematical concepts such as sets, relations, functions, and	K_1,K_2
	CO2	Discuss various structures and properties of modern algebra.	K_1,K_2
	CO3	Employ logical abilities such as reasoning to set up mathematical models for real life problems by applying advanced counting and computing techniques like	K_3,K_4
	CO4	Demonstrate various problems in the field of computer science using trees and graphs.	K5,K6
	CO5	Design a solution with the help of induction hypotheses, simple induction proofs and recurrences.	K3,K4

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CO1	3	2	2	3	2	2	1	1	1	1	1	2	3	3
CO2	3	3	3	3	2	2	1	1	1	1	1	2	3	3
CO3	3	2	2	3	3	2	2	1	1	1	1	2	3	3
CO4	3	3	2	2	3	2	2	1	1	1	1	2	3	3
CO5	3	2	2	2	3	2	2	1	1	1	1	2	3	3

Computer System Security (KNC-301)	CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K1,K2
	CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K2
	CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K3
	CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K4
	CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K5,K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	1	3	2	2	2	2	3	3	2	1	3	2	1
CO2	2	3	1	3	3	2	1	3	2	2	1	3	1	2
CO3	2	2	3	2	3	2	1	3	1	3	1	3	2	3
CO4	3	2	3	3	2	3	1	3	3	2	1	3	1	2
CO5	3	2	2	3	3	1	2	3	3	2	1	3	3	1

Practical

Data Structures Using C Lab (KCS 351)	CO1	Implement various Sorting and Searching Algorithms.	K3
	CO2	Analyze the recursive implementation of different sorting and searching algorithms.	K4
	CO3	Implement various data Structure using static and dynamic memory allocation.	K3,K4
	CO4	Demonstrate various operations like traversal, insertion, deletion on tree data structure.	K3
	CO5	Design and Implement practical applications based on graphs and shortest paths.	K5

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CO1	3	3	3	2	2	2	1	1	1	1	1	2	3	3
CO2	3	3	3	3	2	2	1	1	1	1	1	2	3	3
CO3	3	3	3	3	2	2	1	1	1	1	1	2	3	3
CO4	3	3	3	3	2	2	1	1	1	1	1	2	3	3
CO5	3	3	3	3	2	2	1	1	1	1	1	2	3	3

Computer Organization Lab (KCS 352)	CO1	Examine the output of the basic logic gates for different combinations of input.	K3
	CO2	Design and simulate the combinational circuits for binary arithmetic (such as adders, subtractors, and multiplier) and code converter	K6
	CO3	Design and simulate combinational circuits for encoders/decoders and selection devices multiplexers/de-multiplexers using logic gates	K6
	CO4	Design and simulate the basic building block of the sequential circuits (i.e. SR and D Flip Flops) using logic gates.	K6
	CO5	Design and simulate the 2-bit Arithmetic Logic Unit using logic gates.	K6

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CO1	3	2	2	1	3	2			1		1	1	3	3
CO2	3	2	3	1	3	2			1		1	1	3	3
CO3	2	2	3	1	3	1			1		1	1	3	3
CO4	2	2	3	1	2	1			1		1	1	3	3
CO5	2	2	3	1	2	1			1		1	1	3	3

Discrete Structure and Logic Lab (KCS-353)	CO1	To Implement various Set operations.	K2,K3
	CO2	To Demonstrate various basic Maple commands.	K_1,K_2
	CO3	To Implement various Inductive techniques, Recursive Techniques and expected value problems using Maple script.	K_3,K_4
	CO4	To Design and Implement practical applications based on graphs and shortest paths.	K5
	CO5	To Implement various programming problems based on binary search.	K3, K4

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2	3	2	2	1	1	1	1	1	2	3	3
CO2	3	3	3	3	2	2	1	1	1	1	1	2	3	3
CO3	3	2	2	3	3	2	2	1	1	1	1	2	3	3
CO4	3	3	2	2	3	2	2	1	1	1	1	2	3	3
CO5	3	2	2	2	3	2	2	1	1	1	1	2	3	3

Mini Project or Internship Assessment (KCS354)	CO1	Analyze and understand the real life problem and apply their knowledge to get programming solution	K1,K2,K4
	CO2	Engage in the creative design process through the integration and application of diverse technical knowledge and expertise to meet customer needs and address social issues.	K2,K3
	CO3	Use the various tools and techniques, coding practices for developing real life solution to the problem.	K2,K4
	CO4	Writing and presentation skill by using report about what they are doing in mini project.	K1,K5
	CO5	Find out the errors in application solutions and its implementations.	K5,K6

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CO1	3	3	3	2	3	3	2	1	3	3	3	3	2	1
CO2	3	3	3	2	3	3	2	1	3	3	3	3	3	2
CO3	3	3	3	3	3	3	2	1	3	3	3	3	1	2
CO4	3	3	2	2	3	3	2	1	3	3	3	3	2	3
CO5	3	3	2	2	3	3	2	1	3	3	3	3	2	3

CO PO and Mapping of CO PO 3rd Year

(2018-2022 BATCH)

Session:- 2020-21 Semester:- 5th

S.No.	Subject	Code
1	Machine Learning Techniques	KCS 055
2	Database Management System	KCS 501
3	Design and Analysis of Algorithm	KCS 503
4	Web Technology	KIT 501
5	Object Oriented System Design	KCS 054
6	Indian Tradition, Culture and Society	KNC 502
7	Database Management System Lab	KCS 551
8	Design and Analysis of Algorithm Lab	KCS 553
9	Web Technology Lab	KIT 551

Theory

Machine Learning Techniques (KCS 055)	CO1	To understand the need for machine learning for various problem solving	K_1 , K_2
	CO2	To understand a wide variety of learning algorithms and how to solve computing problem.	K_2 , K_3
	CO3	To design appropriate machine learning algorithms and apply the algorithms to a real-world problems.	K_2 , K_3
	CO4	To understand the neural nets for solving real time problem and evaluating the performance.	K_5 , K_6
	CO5	To optimize the models learned and report on the expected accuracy that can be achieved by analyzing the models.	K4,K5

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	3	2	2	2	1	1		1	3	2	3
CO2	3	3	3	3	3	2	2		1		1	3	3	3
CO3	3	3	3	3	3	2	2		1		1	3	3	3
CO4	3	3	3	3	3	2	2		1		1	3	3	3
CO5	3	3	3	3	3	2	2		1		1	3	3	3

Database Management Systems (KCS 501)	CO1	Apply knowledge of database for real life applications.	K1,K2,K3
	CO2	Apply query processing techniques to automate the real time problems of databases.	K3, K4
	CO3	Identify and solve the redundancy problem in database tables using normalization.	K2, K3
	CO4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and	K2, K3
	CO5	Design, develop and implement a small database project using database tools.	K3, K5,K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	2	1	1	2	2	2	3	2	3	3
CO2	3	3	3	3	2	1	1	1	2	2	3	2	3	3
CO3	3	3	3	3	2	1	1	1	2	2	2	2	3	3
CO4	3	2	3	3	2	2	2	1	2	2	2	2	3	3
CO5	2	2	3	3	2	2	2	2	2	2	2	2	3	3

Design and Analysis of Algorithm (KCS 503)	CO1	Understand the designing new algorithms, prove them correct, and analyze their asymptotic and absolute runtime and memory demands.	K_2,K_4
	CO2	Apply the algorithm to solve the problem and prove that the algorithm solves the problem correctly.	K_3,K_4
	CO3	Analyze the mathematical criterion for deciding whether an algorithm is efficient, and know by evaluating many practically important problems that do not admit any	K_4,K_5
	CO4	Apply and design the classical sorting, searching, optimization and graph algorithms.	K3, K5
	CO5	Examine and formulate the basic techniques for designing algorithms and applying the techniques of recursion, divide-and-conquer, dynamic programming and greedy.	K3, K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	2	1	1				1	3	3	3
CO2	3	3	3	3	2	1	1				1	3	2	3
CO3	3	3	2	2	3	1	1				1	2	2	2
CO4	3	3	3	3	3	1	1				1	2	3	2
CO5	3	3	3	3	3	1	1				1	3	2	2

Web Technology (KIT 501)	CO1	Apply the knowledge of the internet and related internet concepts that are vital in understanding web application development	K3,K6
	CO2	Understand, analyze, and apply the role of markup languages like HTML, DHTML, and XML in the workings of the web and its applications.	K2,K3
	CO3	Use web application development software tools i.e. XML, Apache Tomcat etc. and identifies the environments currently available on the market to design web sites.	K3,K6
	CO4	Understand, analyze, and build dynamic web pages using client-side programming JavaScript and develop the web application using servlet and JSP.	K2,K4, K6
	CO5	Understand the impact of web designing by database connectivity with JDBC	K2, K3, K4

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	1	3	3	2	1		2	2	1	3	3	3
CO2	2	3	2	1	3	1			3	2	3	2	3	3
CO3	2	3	2	2	3	2	1		2	2	3	2	3	3
CO4	3	3	3	3	3	2	2		2	2	3	2	3	3
CO5	3	3	2	3	3	1			2	1	1	3	3	3

Object Oriented System Design (KCS 054)	CO1	Understand the application development and analyze the insights of object oriented programming to implement application.	K_1,K_2,K_4
	CO2	Understand, analyze and apply the role of overall modeling concepts (i.e. System, structural).	K_2,K_3,K_4
	CO3	Learn the structured analysis / structured design and analyze the oops programming style.	K_2,K_4
	CO4	Apply and evaluate the concepts of C++ for the implementation of object oriented concepts.	K3, K5
	CO5	Design and evaluate the programming concepts to implement object oriented modeling in C++.	K5, K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	1	3	3	3	1	2	2	3	2	3	3	3
CO2	3	3	2	3	3	3	1	2	3	3	3	3	3	3
CO3	3	2	2	2	3	3	1	2	2	3	2	3	3	3
CO4	3	3	3	3	3	3	2	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	2	2	3	3	3	3	3	3

Indian Tradition, Culture and Society (KNC 502)	CO1	To identify and understand the roots and details of Society State and Polity in India.	K1, K2
	CO2	To understand the importance of Indian Literature, Culture, Tradition, Practices and to apply in present system.	K2, K3
	CO3	To analyze the Indian Religion, Philosophy, Practices and in shadow of Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy and to apply in	K3, K4
	CO4	To analyze the Science, Management and Indian Knowledge System and to apply in present system.	K3, K4
	CO5	To evaluate the Indian Architect, Engineering and Architecture in Ancient India, Indian's Cultural Contribution to the World and to create environment in Arts and	K5,K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	2	2	2	2	2	1	2	1	1	2	2	1	1
CO2	2	2	2	2	2	2	2	2	1	1	2	2	1	1
CO3	2	2	1	2	2	2	1	2	1	1	2	2	1	1
CO4	3	1	1	1	1	1	1	1	1	1	3	3	2	1
CO5	2	1	1	1	1	1	1	1	1	1	2	2	2	1

Practical

Database Management Systems Lab (KCS 551)	CO1	Understand and apply MYSQL products for creating tables, views, indexes, sequences and other database objects.	K1,K2,K3
	CO2	Design and implement a database schema for company data base, banking data base, library information system, payroll processing system, student information system.	K4,K5
	CO3	Design and implement simple and complex queries using DDL, DML, DCL and TCL.	K4,K5
	CO4	Implement PL/SQL blocks, procedure functions, packages and triggers, cursors.	K5
	CO5	Demonstrate entity integrity, referential integrity, key constraints, and domain constraints on database.	K1,K3

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CO1	2	2	3	2	2	2	1	1	2	1	2	2	3	3
CO2	3	3	2	2	3	1	2	1	2	2	3	3	3	3
CO3	3	2	2	2	2	2	1	1	2	1	2	2	3	3
CO4	2	2	3	2	2	2	2	1	2	2	3	2	3	3
CO5	3	3	2	2	3	1	1	1	2	1	2	3	3	3

Design and Analysis of Algorithm Lab (KCS 553)	CO1	Implement and analyze various sorting algorithms like Modified Bubble Sort, Selection Sort, Insertion Sort, Shell Sort, Quick Sort, Merge Sort, Heap Sort and Counting Sort.	K2,K3,K4
	CO2	Demonstrate the working of Searching algorithms in data structure.	K3
	CO3	Apply different algorithm design techniques like divide and conquer, greedy methods.	K3,K4
	CO4	Experiment and Synthesize efficient algorithm in common engineering design situations for alphanumeric strings and produces a Longest-Common-Subsequence of the two strings.	K3
	CO5	Redefine and formulate the existing algorithm of Backtracking to find the solution for N-Queen problem.	K6

CO \ PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	2	1							3	3	2
CO2	3	3	2	2	1							3	2	2
CO3	2	3	2	3	2							2	3	3
CO4	2	2	2	1	1							2	2	2
CO5	2	2	2	1	2							2	2	3

Web Technology Lab (KIT 551)	CO1	Understand fundamentals of web development and Java, including defining classes, invoking methods, using class libraries, Applet, AWT.	K2,K4
	CO2	Understand, analyze, and apply the role of scripts/languages like HTML, DHTML, CSS, XML, DOM, and SAX to solve real world problems.	K2,K3,K5
	CO3	Understand, analyze, and design the role of JavaScript for dynamic web pages.	K2,K4,K5
	CO4	Design and deploy different components using EJB, and database tables using JDBC and produce various results based on given query.	K4,K5
	CO5	Design and deploy a server-side java application called Servlet & JSP tools to catch form data sent from client, process it and store it on database.	K3,K4

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CO1	2	3	3	3	3	2	1		2	2	2	2	3	3
CO2	2	3	2	3	3	2	2		2	2	2	2	3	3
CO3	2	3	3	3	3	1	1		2	2	3	3	3	3
CO4	3	3	3	3	3	2			1	2	1	3	3	3
CO5	3	3	3	3	3	2			1	1	2	3	3	3