Hindustan College of Science and Technology

Department of Computer Science Engineering

COURSE OUTCOMES
(SESSION 2021-22)

B.TECH (COMPUTER SCIENCE AND ENGINEERING)

SEMESTER- III

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KOE031-38/ KAS302	Engineering Science Course/Maths IV	3	1	0	30	20	50		100		150	4
2	KAS301/ KVE 301	Technical Communication/Universal Human values	2	1	0	30	20	50		100		150	3
			3	0	0								
3	KCS301	Data Structure	3	1	0	30	20	50		100		150	4
4	KCS302	Computer Organization and Architecture	3	1	0	30	20	50		100		150	4
5	KCS303	Discrete Structures & Theory of Logic	3	0	0	30	20	50		100		150	3
6	KCS351	Data Structures Using C Lab	0	0	2				25		25	50	1
7	KCS352	Computer Organization Lab	0	0	2				25		25	50	1
8	KCS353	Discrete Structure & Logic Lab	0	0	2				25		25	50	1
9	KCS354	Mini Project or Internship Assessment*	0	0	2			50				50	1
10	KNC301/ KNC302	Computer System Security/Python Programming	2	0	0	15	10	25		50			0
11		MOOCs (Essential for Hons. Degree)											
		Total										950	22

*The Mini Project or internship (3-4 weeks) conducted during summer break after II semester and will be assessed during III semester.

SEMESTER- IV

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS402/ KOE041-48	Maths IV/Engg. Science Course	3	1	0	30	20	50		100		150	4
2	KVE401/ KAS301	Universal Human Values/ Technical Communication	3	0	0	30	20	50		100		150	3
			2	1	0								
3	KCS401	Operating Systems	3	0	0	30	20	50		100		150	3
4	KCS402	Theory of Automata and Formal Languages	3	1	0	30	20	50		100		150	4
5	KCS403	Microprocessor	3	1	0	30	20	50		100		150	4
6	KCS451	Operating Systems Lab	0	0	2				25		25	50	1
7	KCS452	Microprocessor Lab	0	0	2				25		25	50	1
8	KCS453	Python Language Programming Lab	0	0	2				25		25	50	1
9	KNC402/ KNC401	Python Programming/Computer System Security	2	0	0	15	10	25		50			0
10		MOOCs (Essential for Hons. Degree)											
		Total										**900**	**21**

B.TECH (COMPUTER SCIENCE & ENGINEERING/ COMPUTER SCIENCE)CURRICULUM STRUCTURE

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KCS501	Database Management System	3	1	0	30	20	50		100		150	4
2	KCS502	Compiler Design	3	1	0	30	20	50		100		150	4
3	KCS503	Design and Analysis of Algorithm	3	1	0	30	20	50		100		150	4
4	Deptt. Elective-I	Departmental Elective-I	3	0	0	30	20	50		100		150	3
5	Deptt. Elective-II	Departmental Elective-II	3	0	0	30	20	50		100		150	3
6	KCS551	Database Management System Lab	0	0	2				25		25	50	1
7	KCS552	Compiler Design Lab	0	0	2				25		25	50	1
8	KCS553	Design and Analysis of Algorithm Lab	0	0	2				25		25	50	1
9	KCS554	Mini Project or Internship Assessment*	0	0	2				50			50	1
10	KNC501/ KNC502	Constitution of India, Law and Engineering / Indian Tradition, Culture and Society	2	0	0	15	10	25		50			
11		MOOCs (Essential for Hons. Degree)											
		Total	**17**	**3**	**8**							**950**	**22**

SEMESTER- V

*The Mini Project or internship (4 weeks) conducted during summer break after IV semester and will be assessed during V semester.

<table>
<tr><td colspan="14" align="center">**SEMESTER- VI**</td></tr>
<tr>
<td rowspan="2">**Sl. No.**</td>
<td rowspan="2">**Subject Codes**</td>
<td rowspan="2">**Subject**</td>
<td colspan="3">**Periods**</td>
<td colspan="3">**Evaluation Scheme**</td>
<td colspan="2">**End Semester**</td>
<td rowspan="2">**Total**</td>
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<tr>
<td>**L**</td><td>**T**</td><td>**P**</td>
<td>**CT**</td><td>**TA**</td><td>**Total**</td>
<td>**PS**</td><td>**TE**</td><td>**PE**</td>
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<tr><td>1</td><td>KCS601</td><td>Software Engineering</td><td>3</td><td>1</td><td>0</td><td>30</td><td>20</td><td>50</td><td></td><td>100</td><td></td><td>150</td><td>4</td></tr>
<tr><td>2</td><td>KCS602</td><td>Web Technology</td><td>3</td><td>1</td><td>0</td><td>30</td><td>20</td><td>50</td><td></td><td>100</td><td></td><td>150</td><td>4</td></tr>
<tr><td>3</td><td>KCS603</td><td>Computer Networks</td><td>3</td><td>1</td><td>0</td><td>30</td><td>20</td><td>50</td><td></td><td>100</td><td></td><td>150</td><td>4</td></tr>
<tr><td>4</td><td>Deptt. Elective-III</td><td>Departmental Elective-III</td><td>3</td><td>0</td><td>0</td><td>30</td><td>20</td><td>50</td><td></td><td>100</td><td></td><td>150</td><td>3</td></tr>
<tr><td>5</td><td></td><td>Open Elective-I [Annexure - B(iv)]</td><td>3</td><td>0</td><td>0</td><td>30</td><td>20</td><td>50</td><td></td><td>100</td><td></td><td>150</td><td>3</td></tr>
<tr><td>6</td><td>KCS651</td><td>Software Engineering Lab</td><td>0</td><td>0</td><td>2</td><td></td><td></td><td></td><td>25</td><td></td><td>25</td><td>50</td><td>1</td></tr>
<tr><td>7</td><td>KCS652</td><td>Web Technology Lab</td><td>0</td><td>0</td><td>2</td><td></td><td></td><td></td><td>25</td><td></td><td>25</td><td>50</td><td>1</td></tr>
<tr><td>8</td><td>KCS653</td><td>Computer Networks Lab</td><td>0</td><td>0</td><td>2</td><td></td><td></td><td></td><td>25</td><td></td><td>25</td><td>50</td><td>1</td></tr>
<tr><td>9</td><td>KNC601/ KNC602</td><td>Constitution of India, Law and Engineering / Indian Tradition, Culture and Society</td><td>2</td><td>0</td><td>0</td><td>15</td><td>10</td><td>25</td><td></td><td>50</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td></td><td>MOOCs (Essential for Hons. Degree)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>**Total**</td><td>**0**</td><td>**3**</td><td>**6**</td><td></td><td></td><td></td><td></td><td></td><td></td><td>**900**</td><td>**21**</td></tr>
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Departmental Elective-I

1. KCS-051 Data Analytics
2. KCS-052 Web Designing
3. KCS-053 Computer Graphics
4. KCS-054 Object Oriented System Design

Departmental Elective-II

1. KCS-055 Machine Learning Techniques
2. KCS-056 Application of Soft Computing
3. KCS-057 Augmented & Virtual Reality
4. KCS-058 Human Computer Interface

Departmental Elective-III

1. KCS-061 Big Data
2. KCS-062 Image Processing
3. KCS-063 Real Time Systems
4. KCS-064 Data Compression

				SEMESTER- VII									
Sl. No.	**Subject**	**Subject**	**Periods**			**Evaluation Scheme**				**End Semester**		**Total**	**Credit**
	Codes		**L**	**T**	**P**	**CT**	**TA**	**Total**	**PS**	**TE**	**PE**		
1	KHU701/KHU702	HSMC -1 / HSMC-2	3	0	0	30	20	50		100		150	3
2	KCS07X	Departmental Elective-IV	3	0	0	30	20	50		100		150	3
3	KCS07X	Departmental Elective-V	3	0	0	30	20	50		100		150	3
4	KOE07X	Open Elective-II	3	0	0	30	20	50		100		150	3
5	KCS751A	The Department may conduct one Lab of either of the two Electives (4 or 5) based on the elective chosen for the curriculum. The Department shall on its own prepare complete list of practical for the Lab and arrange for proper setup and conduct accordingly.	0	0	2				25		25	50	1
6	KCS752	Mini Project or Internship Assessment*	0	0	2				50			50	1
7	KCS753	Project	0	0	8				150			150	4
8		MOOCs (Essential for Hons. Degree)											
		Total	**12**	**0**	**12**							**850**	**18**

*The Mini Project or internship (4 - 6 weeks) conducted during summer break after VI semester and will be assessed during VII semester.

				SEMESTER- VIII									
Sl. No.	**Subject**	**Subject**	**Periods**			**Evaluation Scheme**				**End Semester**		**Total**	**Credit**
	Codes		**L**	**T**	**P**	**CT**	**TA**	**Total**	**PS**	**TE**	**PE**		
1	KHU801/KHU802	HSMC-1[#]/HSMC-2[#]	3	0	0	30	20	50		100		150	3
2	KOE08X	Open Elective-III	3	0	0	30	20	50		100		150	3
3	KOE08X	Open Elective-IV	3	0	0	30	20	50		100		150	3
4	KCS851	Project 1	0	0	18				100		300	400	9
5		MOOCs (Essential for Hons. Degree)											
		Total	**9**	**0**	**18**							**850**	**18**

Departmental Elective-IV
1. KCS071 Artificial Intelligence
2. KCS072 Natural language processing
3. KCS073 High Performance Computing
4. KCS074 Cryptography and Network Security
5. KCS075 Design & Development of Applications
6. KCS076 Software Testing
7. KCS077 Distributed Systems

Departmental Elective-V

1. KCS078 Deep Learning
2. KCS079 Service Oriented Architecture
3. KCS710 Quantum Computing
4. KCS711 Mobile Computing
5. KCS712 Internet of Things
6. KCS713 Cloud Computing
7. KCS714 Blockchain Architecture Design

Program Outcomes (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome (PSOs)

1. Capability to design and develop effective technological solutions for complex business challenges, making use of the appropriate data structures, algorithms and database systems.
2. The capacity to apply fundamental computing skills as well as contemporary computer programming languages and environments to build innovative research projects for the benefit of a social cause.
3. The capacity to understand and implement software engineering process models, software design principles, and software project management methodologies in order to ensure the successful implementation of software projects.

Department: Computer Science & Engineering

Course Outcomes(COs):B.Tech.2nd , 3rd and 4th year

Session:2021-22

B.Tech: 3rd Semester

KAS302	MATHS IV	CO1	Remember the concept of partial differential equation and to solve partial differential equations.
		CO2	Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations.
		CO3	Understand the concept of correlation, moments, skewness and kurtosis and curve fitting .
		CO4	Remember the concept of probability to evaluate probability distributions.
		CO5	:Apply the concept of hypothesis testing and statistical quality control to create control charts.
KHU305	HUMAN VALUES	CO1	Understand the process of self-exploration and meaning of natural acceptance.
		CO2	Evaluate the harmony in human being.
		CO3	Analyze the process of developing harmony in family and society.
		CO4	Analyze the process of developing the
		CO5	Apply the role of holistic understanding of harmony of professional ethics.
KCS302	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1	Study of the basic structure and operation of a digital computer system
		CO2	Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floatingpoint arithmetic operations.
		CO3	Implementation of control unit techniques and the concept of Pipelining
		CO4	Understanding the hierarchical memory system, cache memories and virtual memory
		CO5	Understanding the different ways of communicating with I/O devices and standard I/O interfaces
KCS303	DISCRETE STRUCTURES & THEORY OF LOGIC	CO1	Write an argument using logical notation and determine if the argument is or is not valid.
		CO2	Understand the basic principles of sets and operations in sets.
		CO3	Demonstrate an understanding of relations and functions and be able to determine their properties.
		CO4	Demonstrate different traversal methods for trees and graphs.
		CO5	Model problems in Computer Science using graphs and trees.

KCS301	DATA STRUCTURES	CO1	Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.
		CO2	Discuss the computational efficiency of the sorting and searching algorithms.
		CO3	Implementation of Trees and Graphs and perform various operations on these data structure.
		CO4	Understanding the concept of recursion, application of recursion and its implementation and removal of recursion.
		CO5	Identify the alternative implementations of data structures with respect to its performance to solve a real world problem.
KCS352	COMPUTER ORGANIZATION AND ARCHITECTURE LAB	CO1	Implementing HALF ADDER, FULL ADDER using basic logic gates
		CO2	Implementing Binary -to -Gray, Gray -to -Binary code conversions.
		CO3	Implementing 3-8 line DECODER.
		CO4	Implementing 4x1 and 8x1 MULTIPLEXERS.
		CO5	Verify the excitation tables of various FLIP-FLOPS.
KCS353	DISCRETE STRUCTURES & THEORY OF LOGIC LAB	CO1	Write an argument using logical notation and determine if the argument is or is not valid.
		CO2	Understand the basic principles of sets and operations in sets.
		CO3	Demonstrate an understanding of relations and functions and be able to determine their properties.
		CO4	Demonstrate different traversal methods for trees and graphs.
		CO5	Model problems in Computer Science using graphs and trees.
KNC301	COMPUTER SYSTEM SECURITY	CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats
		CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats.
		CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.
		CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios
		CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques
KCS301	DATA STRUCTURES	CO1	Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.
		CO2	Discuss the computational efficiency of the sorting and searching algorithms.
		CO3	Implementation of Trees and Graphs and perform various operations on these data structure.
		CO4	Understanding the concept of recursion, application of recursion and its implementation and removal of recursion.

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KCS352	COMPUTER ORGANIZATION AND ARCHITECTURE LAB	CO1	Implementing HALF ADDER, FULL ADDER using basic logic gates
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		CO3	Implementing 3-8 line DECODER.
		CO4	Implementing 4x1 and 8x1 MULTIPLEXERS.
		CO5	Verify the excitation tables of various FLIP-FLOPS.
KCS353	DISCRETE STRUCTURES & THEORY OF LOGIC LAB	CO1	Students are able to recall, from previous set theoretical knowledge, concepts of basic set operations and should be able to design solutions to simple socio-engineering problems by way of computer programs.Students are able to apply the concepts of inference theory to prove validity of mathematical or societal arguments.
		CO2	Students are able to simulate probability theory concepts. The students should be able to analyze a socio-engineering problem of probability theory, design algorithm for it and implement it .
		CO3	Students are able to design algorithmic solutions to socio-engineering problems of binary relations that would answer complex queries of the user
		CO4	Students are able to apply the concepts of inference theory to prove validity of mathematical or societal arguments.
		CO5	Students learnt the concepts of graph theory and apply in complex engineering and social problems
KCS354	MINI PROJECT LAB	CO1	The student gets a general knowledge about how to design and develop a mini project.
		CO2	The student gets an idea on how to work as a team to analyze a given problem definition.
		CO3	The student is able to use modern tools to develop a small database project by working as a team.
		CO4	The student is able to perform database connectivity from front-end applications.
		CO5	The student is made able to design and develop small sized applications using databases in the back-end.
KCS351	DATA STRUCTURES LAB	CO1	Implement linear and non linear data structures using linked list.
		CO2	Apply various data structures such as stack, queue and tree to solve the problems.
		CO3	Implement various searching and sorting techniques.
		CO4	Analyze the complexity of the algorithms.
		CO5	Choose appropriate data structure while designing the applications.

B.Tech: 4th Semester			
KCS401	OPERATING SYSTEMS	CO1	Understand the structure and functions of OS
		CO2	Learn about Processes, Threads and Scheduling algorithms.
		CO3	Understand the principles of concurrency and Deadlocks
		CO4	Learn various memory management scheme
		CO5	Study I/O management and File systems.
KNC402	PYTHON PROGRAMMING	CO1	To read and write simple Python programs.
		CO2	To develop Python programs with conditionals and loops.
		CO3	To define Python functions and to use Python data structures –- lists, tuples, dictionaries
		CO4	To do input/output with files in Python
		CO5	To do searching, sorting and merging in Python
KCS402	THEORY OF AUTOMATA AND FORMAL LANGUAGES	CO1	Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.
		CO2	Analyse and design, Turing machines, formal languages, and grammars
		CO3	Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving
		CO4	Prove the basic results of the Theory of Computation.
		CO5	State and explain the relevance of the Church-Turing thesis.
KCS403	MICROPROCESSOR	CO1	Apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
		CO2	Analyze a detailed s/w & h/w structure of the Microprocessor.
		CO3	Illustrate how the different peripherals (8085/8086) are interfaced with Microprocessor.
		CO4	Analyze the properties of Microprocessors(8085/8086)
		CO5	Evaluate the data transfer information through serial & parallel ports.
KAS401	TECHNICAL COMMUNICATION	CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.
		CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.
		CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.

		CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.
		CO5	It would enable them to evaluate their efficacy as fluent and efficient communicators by learning the voice-dynamics.
KOE049	DIGITAL ELECTRONICS	CO1	Apply concepts of Digital Binary System and implementation of Gates.
		CO2	Analyze and design of Combinational logic circuits. K4
		CO3	Analyze and design of Sequential logic circuits with their applications.
		CO4	Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits.
		CO5	Apply the concept of Digital Logic Families with circuit implementation.
KCS451	OPERATING SYSTEMS LAB	CO1	Experiment with Unix commands and shell programming
		CO2	Examine key algorithms, such as process scheduling and memory management.
		CO3	Design 'C' programme that uses system calls to manage processes and file systems.
		CO4	Implementation of operating system's resource management, deadlock management, and memory management strategies.
		CO5	Determine that how various page replacement methods perform.
KCS452	MICROPROCESSOR LAB	CO1	Write a program using 8085 Microprocessor for Decimal, Hexadecimal addition and subtraction of two Numbers.
		CO2	Write a program using 8085 Microprocessor for addition and subtraction of two BCD numbers.
		CO3	To perform multiplication and division of two 8 bit numbers using 8085.
		CO4	To find the largest and smallest number in an array of data using 8085 instruction set.
		CO5	To write a program to arrange an array of data in ascending and descending order.
KCS453	PYTHON PROGRAMMING LAB	CO1	Students are able to read and write simple python programs and understand about command line arguments
		CO2	Students are to develop Python programs with conditionals and loops.
		CO3	Students are able to implement Python data structures –- lists, tuples, dictionaries using python programming language
		CO4	Students are able to implements recursive function using python programming
		CO5	Students are able to implements searching, sorting and merging algorithms in Python.

			B.Tech:5th Semester
KCS503	DESIGN AND ANALYSIS OF ALGORITHMS	CO1	Create and develop algorithms for a range of computing issues.
		CO2	Demonstrate a working knowledge of the main algorithms and data structures.
		CO3	Analyze time and space complexity by solving problems.
		CO4	Implement a given issue utilizing various algorithmic design methods.
		CO5	Create effective algorithms to be used in typical engineering design scenarios.
KCS501	DATABASE MANAGEMENT SYSTEM KCS501	CO1	Apply knowledge of database for real life applications.
		CO2	Apply query processing techniques to automate the real time problems of databases.
		CO3	Identify and solve the redundancy problem in database tables using normalization.
		CO4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.
		CO5	Design, develop and implement a small database project using database tools.
KCS502	COMPILER DESIGN	CO1	Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.
		CO2	Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table.
		CO3	Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.
		CO4	Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.
		CO5	Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.
KCS051	DATA ANALYTICS	CO1	Describe the life cycle phases of Data Analytics through discovery, planning and building.
		CO2	Understand and apply Data Analysis Techniques.
		CO3	Implement various Data streams.
		CO4	Understand item sets, Clustering, frame works & Visualizations.
		CO5	Apply R tool for developing and evaluating real time applications.

KCS055	MACHINE LEARNING	CO1	To understand the need for machine learning for various problem solving
		CO2	To understand a wide variety of learning algorithms and how to evaluate models generated from data
		CO3	To understand the latest trends in machine learning
		CO4	To design appropriate machine learning algorithms and apply the algorithms to a real-world problems
		CO5	To optimize the models learned and report on the expected accuracy that can be achieved by applying the models
KCS553	DESIGN AND ANALYSIS OF ALGORITHMS LAB	CO1	Implement algorithm to solve problems by iterative approach.
		CO2	Implement algorithm to solve problems by divide and conquer approach
		CO3	Implement algorithm to solve problems by Greedy algorithm approach.
		CO4	Implement algorithm to solve problems by Dynamic programming, backtracking,branch and bound approach.
		CO5	Implement algorithm to solve problems by branch and bound approach.
KCS551	DATABASE MANAGEMENT SYSTEM LAB	CO1	Understand and apply oracle 11 g products for creating tables, views, indexes, sequences and other database objects.
		CO2	Design and implement a database schema for company data base, banking data base, library information system, payroll processing system, student information system.
		CO3	Write and execute simple and complex queries using DDL, DML, DCL and TCL
		CO4	Write and execute PL/SQL blocks, procedure functions, packages and triggers, cursors.
		CO5	Enforce entity integrity, referential integrity, key constraints, and domain constraints on database.
KCS502	COMPILER DESIGN LAB	CO1	Identify patterns, tokens & regular expressions for lexical analysis.
		CO2	Design Lexical analyser for given language using C and LEX /YACC tools
		CO3	Design and analyze top down and bottom up parsers.
		CO4	Generate the intermediate code
		CO5	Generate machine code from the intermediate code forms
KCS554	MINI PROJECT LAB	CO1	Identify project planning objectives, along with various cost/effort estimation models.
		CO2	Organize & schedule project activities to compute critical path for risk analysis.
		CO3	Monitor and control project activities.
		CO4	Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.

		CO5	Configure changes and manage risks using project management tools.

B.Tech: 6th Semester			
KNC601	INDIAN CONSTITUTION	CO1	Identify and explore the basic features and modalities about Indian constitution
		CO2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.
		CO3	Demonstrate different aspects of Indian Legal System and its related bodies.
		CO4	Discover and apply different laws and regulations related to engineering practices.
		CO5	Interpret and evaluate the role of engineers with different organizations and governance models
KCS601	SOFTWARE ENGINEERING	CO1	Explain various software characteristics and analyze different software Development Models.
		CO2	Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards.
		CO3	Compare and contrast various methods for software design
		CO4	Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing.
		CO5	Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.
KCS603	COMPUTER NETWORK	CO1	Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission
		CO2	Apply channel allocation, framing, error and flow control techniques.
		CO3	Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.
		CO4	Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.
		CO5	Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP,TELNET and VPN.
KCS602	WEB TECHNOLOGY	CO1	Explain web development Strategies and Protocols governing Web.
		CO2	Develop Java programs for window/web-based applications.
		CO3	Design web pages using HTML, XML, CSS and JavaScript.
		CO4	Creation of client-server environment using socket programming
		CO5	Building enterprise level applications and manipulate web databases using JDBC
KCS062	DIGITAL IMAGE PROCESSING	CO1	Explain the basic concepts of two-dimensional signal acquisition, sampling,quantization and color model.
		CO2	Apply image processing techniques for image enhancement in both the spatial and frequency domains.

		CO3	Apply and compare image restoration techniques in both spatial and frequency domain.
		CO4	Compare edge based and region based segmentation algorithms for ROI extraction.
		CO5	Explain compression techniques and descriptors for image processing.
KNC602	INDIAN TRADITION, CULTURE AND SOCIETY	CO1	To identify and understand the roots and details of Society State and Polity in India.
		CO2	To understand the importance of Indian Literature, Culture, Tradition, Practices and to apply in present system
		CO3	To analyze the Indian Religion, Philosophy, Practices and in shadow of Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy.
		CO4	To analyze the Science, Management and Indian Knowledge System and to apply in present system.
		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.
KOE060	IDEA TO BUSINESS MODEL	CO1	Enhance creative knowledge of students regarding selection of a business idea and it's implementation process.
		CO2	Acquire knowledge on entrepreneurship development, its Pro's and con's.
		CO3	Acquire basic knowledge on how to become an Entrepreneur.
		CO4	Develop knowledge on Production systems and it's sustainability through production, planning and control (PPC)
		CO5	Develop appropriate business model and apply in a better way.
KCS651	SOFTWARE ENGINEERING LAB	CO1	Identify ambiguities, inconsistencies and incompleteness from a requirements specification and state functional and non-functional requirement
		CO2	Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship
		CO3	Draw a class diagram after identifying classes and association among them
		CO4	Graphically represent various UML diagrams , and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially
		CO5	Able to use modern engineering tools for specification, design, implementation and testing
KCS653	COMPUTER NETWORK LAB	CO1	Simulate different network topologies.
		CO2	Implement various framing methods of Data Link Layer.
		CO3	Implement various Error and flow control techniques.
		CO4	Implement network routing and addressing techniques.
		CO5	Implement transport and security mechanisms

KCS652	WEB TECHNOLOGY LAB	CO1	Develop static web pages using HTML
		CO2	Develop Java programs for window/web-based applications.
		CO3	Design dynamic web pages using Javascript and XML.
		CO4	Design dynamic web page using server site programming Ex. ASP/JSP/PHP
		CO5	Design server site applications using JDDC,ODBC and section tracking API

B.Tech: 7th Semester

KCS077	DISTRIBUTED SYSTEM	CO1	To provide hardware and software issues in modern distributed systems.
		CO2	To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
		CO3	To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.
		CO4	To know about Shared Memory Techniques and have Sufficient knowledge about file access
		CO5	Have knowledge of Synchronization and Deadlock.
KCS714	BLOCK CHAIN	CO1	Describe the basic understanding of Blockchain architecture along with its primitive.
		CO2	Explain the requirements for basic protocol along with scalability aspects.
		CO3	Design and deploy the consensus process using frontend and backend.
		CO4	Apply Blockchain techniques for different use cases like Finance, Trade/Supply and Government activities
		CO5	Deploy cryptographic algorithm to make block chain network secure
KOE076	HUMAN VALUES	CO1	Understand the process of self-exploration and meaning of natural acceptance.
		CO2	Evaluate the harmony in human being.
		CO3	Analyze the process of developing harmony in family and society.
		CO4	Analyze the process of developing the harmony in nature and existence.
		CO5	Apply the role of holistic understanding of harmony of professional ethics.
KHU701	RURAL DEVELOPMENT	CO1	Students can understand the definitions, concepts and components of Rural Development
		CO2	Students will know the importance, structure, significance, resources of Indian rural economy.
		CO3	Students will have a clear idea about the area development programmes and its impact.

		CO4	Students will be able to acquire knowledge about rural entrepreneurship.
		CO5	Students will be able to understand about the using of different methods for human resource planning.
KCS751 A	DISTRIBUTED SYSTEM LAB	CO1	Design and implement the logical clock concept
		CO2	To get knowledge in distributed architecture, naming, synchronization, consistency
		CO3	Implement Mutual exclusion concept
		CO4	Use of JVM platform for application development
		CO5	To get knowledge of replication, fault tolerance, security, and distributed file systems.
KCS752	INTERNSHIP ASSESSMENT	CO1	Developing a technical artifact requiring new technical skills and effectively utilizing a new software tool to complete a task
		CO2	Writing requirements documentation, Selecting appropriate technologies, identifying and creating appropriate test cases for systems.
		CO3	Demonstrating understanding of professional customs &practices and working with professional standards.
		CO4	Improving problem-solving, critical thinking skills and report writing.
		CO5	Learning professional skills like exercising leadership, behaving professionally, behaving ethically, listening effectively, participating as a member of a team, developing appropriate workplace attitudes.
KCS753	PROJECT	CO1	Analyze and understand the real life problem and apply their knowledge to get programming solution
		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.
		CO3	Use the various tools and techniques, coding practices for developing real life solution to the problem.
		CO4	Find out the errors in software solutions and establishing the process to design maintainable software applications
		CO5	Write the report about what they are doing in project and learning the team working skills
B.Tech: 8th Semester			
KHU802	PROJECT MANAGEMENT & ENTREPRENEU RSHIP	CO1	Understanding basic concepts in the area of entrepreneurship
		CO2	adopting of the key steps in the elaboration of business idea generation and innovation
		CO3	understanding the stages of the entrepreneurial project Management
		CO4	Students should aware of project financing and budget details
		CO5	Developing the understanding and aspect of social entrepreneurship among students
KOE081	CLOUD COMPUTING	CO1	Able to understand basic concepts, principles and paradigm of Cloud Computing

		CO2	Able to interpret various Cloud computing models and services
		CO3	Able to identify the significance of implementing virtualization techniques
		CO4	Able to understand the need of security in Cloud computing.
		CO5	Understand the concept SOA and cloud based storage in Cloud computing
KOE094	DIGITAL & SOCIAL MEDIA MARKETING	CO1	Students will develop an understanding of digital and social media marketing practices
		CO2	Students will develop understanding of the social media platforms
		CO3	Students will acquire the skill to acquire and engage consumers online
		CO4	Students will develop understanding of building organizational competency by way of digital marketing practices and cost considerations
		CO5	Students will develop understanding of the latest digital practices for marketing and promotion
KCS851	PROJECT	CO1	Analyze and understand the real life problem and apply their knowledge to get programming solution.
		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.
		CO3	Use the various tools and techniques, coding practices for developing real life solution to the problem.
		CO4	Find out the errors in software solutions and establishing the process to design maintainable software applications
		CO5	Write the report about what they are doing in project and learning the team working skills