DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2021 REGULATION

<h1 style="text-align:center; color:blue">DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING</h1>

<p style="text-align:center; color:red">2021 REGULATION</p>

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	Apply their technical competence in computer science to solve real world problems, with technical and people leadership.
PEO 2	Conduct cutting edge research and develop solutions on problems of Social relevance.
PEO 3	Work in a business environment, exhibiting team skills, work ethics, adaptability and lifelong learning.

PROGRAM OUTCOMES (POs)

PO1	**Engineering knowledge:** Apply the knowledge of mathematics,science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	**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.
PO3	**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.
PO4	**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.
PO5	**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.
PO6	**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.
PO7	**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.
PO8	**Ethics:** Apply ethical principles and commit professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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 reportsand design documentation, make effective presentations, and give and receive clear instructions.
PO11	**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.

PO12	**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 OUTCOMES (PSOs)

PSO1	Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.
PSO2	Strong theoretical foundation leading to excellence and excitement towards research, to provide elegant solutions to complex problems.
PSO3	Ability to work effectively with various engineering fields as a team to design, build and develop system applications.

LIST OF COURSES

REGULATION 2021

COMPUTER SCIENCE AND ENGINEERING		
SEMESTER I		
S. NO.	**COURSE CODE**	**COURSE TITLE**
1	IP3151	Induction Programme
THEORY		
2	HS3152	Professional English - I
3	MA3151	Matrices and Calculus
4	PH3151	Engineering Physics
5	CY3151	Engineering Chemistry
6	GE3151	Problem Solving and Python Programming
7	GE3152	Heritage of Tamils
PRACTICALS		
8	GE3171	Problem Solving and Python Programming Laboratory
9	BS3171	Physics and Chemistry Laboratory
10	GE3172	English Laboratory
SEMESTER II		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	HS3252	Professional English - II
2	MA3251	Statistics and Numerical Methods
3	PH3256	Physics for Information Science
4	BE3251	Basic Electrical and Electronics Engineering
5	GE3251	Engineering Graphics
6	CS3251	Programming in C
7	GE3252	Tamils and Technology
8		NCC Credit Course Level 1[#]
PRACTICALS		
9	GE3271	Engineering Practices Laboratory
10	CS3271	Programming in C Laboratory
11	GE3272	Communication Laboratory / Foreign Language

SEMESTER III		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	MA3354	Discrete Mathematics
2	CS3351	Digital Principles and Computer Organization
3	CS3352	Foundations of Data Science
4	CS3301	Data Structures
5	CS3391	Object Oriented Programming
PRACTICALS		
6	CS3311	Data Structures Laboratory
7	CS3381	Object Oriented Programming Laboratory
8	CS3361	Data Science Laboratory
9	GE3361	Professional Development
SEMESTER IV		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	CS3452	Theory of Computation
2	CS3491	Artificial Intelligence and Machine Learning
3	CS3492	Database Management Systems
4	CS3401	Algorithms
5	CS3451	Introduction to Operating Systems
6	GE3451	Environmental Sciences and Sustainability
7		NCC Credit Course Level 2[#]
PRACTICALS		
8	CS3461	Operating Systems Laboratory
9	CS3481	Database Management Systems Laboratory
SEMESTER V		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	CS3591	Computer Networks
2	CS3501	Compiler Design
3	CB3491	Cryptography and Cyber Security
4	CS3551	Distributed Computing
5	CSS340	Cyber Security
6	CSS366	Software Testing and Automation
7	MX3084	Disaster Risk Reduction and Management
SEMESTER VI		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	CCS356	Object Oriented Software Engineering
2	CS3691	Embedded Systems and IoT
3		Open Elective – I
4		Professional Elective III

5		Professional Elective IV
6		Professional Elective V
7		Professional Elective VI
8		Mandatory Course-II &
9		NCC Credit Course Level 3#
SEMESTER VII / VIII		
THEORY		
1	GE3791	Human Values and Ethics
2		Elective - Management#
3		Open Elective – II
4		Open Elective – III
5		Open Elective – IV
PRACTICALS		
6	CS3711	Summer internship
SEMESTER VIII /VII		
PRACTICALS		
1	CS3811	Project Work/Internship

COURSE OUTCOME FOR COMPUTER SCIENCE AND ENGINEERING

DEGREE	U.G
PROGRAMME	B.E - COMPUTER SCIENCE AND ENGINEERING
ACADEMIC YEAR	2022-23
REGULATION	2021

SEMESTER 01

1.Course Code and Name : HS3151 PROFESSIONAL ENGLISH - I

	CO Statements	Knowledge Level
At the end of the course, learners will be able		
1	To use appropriate words in a professional context	K2
2	To gain understanding of basic grammatic structures and use them in right context.	K2
3	To read and infer the denotative and connotative meanings of technical texts	K2
4	To write definitions, descriptions, narrations and essays on various topics	K3

2.Course Code and Name : MA3151 MATRICES AND CALCULUS

	CO Statements	Knowledge Level
At the end of the course the students will be able to		
1	Use the matrix algebra methods for solving practical problems.	K3
2	Apply differential calculus tools in solving various application problems.	K3
3	Able to use differential calculus ideas on several variable functions.	K3
4	Apply different methods of integration in solving practical problems.	K3
5	Apply multiple integral ideas in solving areas, volumes and other practical problems.	K3

3.Course Code and Name : PH3151 ENGINEERING PHYSICS

	CO Statements	Knowledge Level
After completion of this course, the students should be able to		
1	Understand the importance of mechanics.	K1
2	Express their knowledge in electromagnetic waves.	K2
3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.	K3
4	Understand the importance of quantum physics.	K3
5	Comprehend and apply quantum mechanical principles towards the formation of energy bands	K4

4.Course Code and Name : CY3151 ENGINEERING CHEMISTRY

	CO Statements	Knowledge Level
At the end of the course, the students will be able:		
1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.	K3
2	To identify and apply basic concepts of nano science and nanotechnology in designing the synthesis of nano materials for engineering and technology applications.	K4
3	To apply the knowledge of phase rule and composites for material selection Requirements.	K2
4	To recommend suitable fuels for engineering processes and applications.	K2

5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.	K3

5.Course Code and Name : GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING

	CO Statements	Knowledge Level
Upon completion of the course, students will be able to		
1	Develop algorithmic solutions to simple computational problems.	K3
2	Develop and execute simple Python programs.	K3
3	Write simple Python programs using conditionals and loops for solving problems.	K4
4	Decompose a Python program into functions.	K4
5	Represent compound data using Python lists, tuples, dictionaries etc.	K4
6	Read and write data from/to files in Python programs.	K4

6.Course Code and Name : GE3171 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

	CO Statements	Knowledge Level
On completion of the course, students will be able to		
1	Develop algorithmic solutions to simple computational problems	K3
2	Develop and execute simple Python programs.	K4
3	Implement programs in Python using conditionals and loops for solving problems.	K2
4	Deploy functions to decompose a Python program.	K3
5	Process compound data using Python data structures.	K4
6	Utilize Python packages in developing software applications.	K2

7.Course Code and Name : BS3171 PHYSICS AND CHEMISTRY LABORATORY

	CO Statements	Knowledge Level
Upon completion of the course, the students will be able to		
PHYSICS LABORATORY		
1	Understand the functioning of various physics laboratory equipment.	K3
2	Use graphical models to analyze laboratory data.	K2
3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.	K1
4	Access, process and analyze scientific information.	K1
5	Solve problems individually and collaboratively.	K1
CHEMISTRY LABORATORY		
1	To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	K2
2	To determine the amount of metal ions through volumetric and spectroscopic techniques	K1
3	To analyse and determine the composition of alloys.	K1
4	To learn simple method of synthesis of nanoparticles	K2
5	To quantitatively analyse the impurities in solution by electro analytical techniques	K3

9. Course Code and Name : GE3172 ENGLISH LABORATORY

	CO Statements	Knowledge Level
At the end of the course the students will be able to		

1	To listen and comprehend complex academic texts	K2
2	To speak fluently and accurately in formal and informal communicative contexts	K3
3	To express their opinions effectively in both oral and written medium of communication	K3

SEMESTER 02

1.Course Code and Name : HS3251 PROFESSIONAL ENGLISH - II

	CO Statements	Knowledge Level
At the end of the course learners will be able to		
1	To compare and contrast products and ideas in technical texts.	K2
2	To identify cause and effects in events, industrial processes through technical texts	K2
3	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format.	K2
4	To report events and the processes of technical and industrial nature.	K3
5	To present their opinions in a planned and logical manner, and draft effective resumes in context of job search.	K4

2.Course Code and Name : MA3251 STATISTICS AND NUMERICAL METHODS

	CO Statements	Knowledge Level
Upon successful completion of the course, students will be able to		
1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	K3
2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.	K3
3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.	K3
4	Understand the knowledge of various techniques and methods for solving first andsecond order ordinary differential equations.	K3
5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.	K3

3.Course Code and Name : PH3256 PHYSICS FOR INFORMATION SCIENCE

	CO Statements	Knowledge Level
At the end of the course, the students should be able to		
1	Gain knowledge on classical and quantum electron theories, and energy band structures	K2
2	Acquire knowledge on basics of semiconductor physics and its applications in various devices.	K3
3	Get knowledge on magnetic properties of materials and their applications in data storage.	K3
4	Have the necessary understanding on the functioning of optical materials for Optoelectronics.	K2
5	Understand the basics of quantum structures and their applications in carbon electronic sand basics of quantum computing.	K2

4.Course Code and Name : BE3251 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

	CO Statements	Knowledge Level
At the end of the course, the students should be able to		

1	Compute the electric circuit parameters for simple problems	K3
2	Explain the working principle and applications of electrical machines	K2
3	Analyze the characteristics of analog electronic devices	K4
4	Explain the basic concepts of digital electronics	K2
5	Explain the operating principles of measuring instruments	K2

5.Course Code and Name : GE3251 ENGINEERING GRAPHICS

	CO Statements	Knowledge Level
At the end of the course, the students should be able to		
1	Use BIS conventions and specifications for engineering drawing.	K3
2	Construct the conic curves, involutes and cycloid.	K3
3	Solve practical problems involving projection of lines.	K3
4	Draw the orthographic, isometric and perspective projections of simple solids.	K5
5	Draw the development of simple solids.	K5

6.Course Code and Name : CS3251 PROGRAMMING IN C

	CO Statements	Knowledge Level
Upon completion of the course, the students will be able to		
1	Demonstrate knowledge on C Programming constructs	K2
2	Develop simple applications in C using basic constructs	K5
3	Design and implement applications using arrays and strings	K5
4	Develop and implement modular applications in C using functions.	K5
5	Develop applications in C using structures and pointers.	K5
6	Design applications using sequential and random access file processing.	K5

7.Course Code and Name : GE3271 ENGINEERING PRACTICES LABORATORY

	CO Statements	Knowledge Level
Upon completion of this course, the students will be able to		
1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.	K5
2	Wire various electrical joints in common household electrical wire work.	K6
3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.	K2
4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	K6

8.Course Code and Name : CS3271 PROGRAMMING IN C LABORATORY

	CO Statements	Knowledge Level
Upon completion of this course, the students will be able to		
1	Demonstrate knowledge on C programming constructs.	K2
2	Develop programs in C using basic constructs.	K5
3	Develop programs in C using arrays.	K5
4	Develop applications in C using strings, pointers, functions.	K5
5	Develop applications in C using structures.Develop applications in C using file Processing.	K5
6	Develop applications in C using file processing.	K5

9.Course Code and Name : GE3272   COMMUNICATION LABORATORY

	CO Statements	Knowledge Level
	Upon completion of this course, the students will be able to	
1	Speak effectively in group discussions held in formal/semi formal contexts.	K3
2	Write emails and effective job applications.	K3

<table>
<tr><td colspan="3" align="center">SEMESTER 03</td></tr>
</table>

1.Course Code and Name : MA3354 DISCRETE MATHEMATICS

	CO Statements	Knowledge Level
	At the end of the course, students would	
1	Have knowledge of the concepts needed to test the logic of a program.	K1
2	Have an understanding in identifying structures on many levels.	K1
3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.	K2
4	Be aware of the counting principles.	K2
5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.	K2

2.Course Code and Name : CS3351 DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

	CO Statements	Knowledge Level
	At the end of the course, students would	
1	Design various combinational digital circuits using logic gates	K5
2	Design sequential circuits and analyze the design procedures	K5
3	State the fundamentals of computer systems and analyze the execution of an instruction	K1
4	Analyze different types of control design and identify hazards	K4
5	Identify the characteristics of various memory systems and I/O communication	K1

3.Course Code and Name : CS3352 FOUNDATIONS OF DATA SCIENCE

	CO Statements	Knowledge Level
	At the end of this course, the students will be able to:	
1	Define the data science process	K1
2	Understand different types of data description for data science process	K1
3	Gain knowledge on relationships between data	K1
4	Use the Python Libraries for Data Wrangling	K3
5	Apply visualization Libraries in Python to interpret and explore data	K3

4.Course Code and Name : CS3301 DATA STRUCTURES

	CO Statements	Knowledge eLevel
	At the end of this course, the students will be able to:	
1	Define linear and non-linear data structures.	K1
2	Implement linear and non–linear data structure operations.	K3
3	Use appropriate linear/non–linear data structure operations for solving a given problem.	K3
4	Apply appropriate graph algorithms for graph applications.	K3
5	Analyze the various searching and sorting algorithms.	K4

5.Course Code and Name : CS3391 OBJECT ORIENTED

PROGRAMMING	
CO Statements	**Knowledge Level**
On completion of this course, the students will be able to	
1	Apply the concepts of classes and objects to solve simple problems	K3
2	Develop programs using inheritance, packages and interfaces	K5
3	Make use of exception handling mechanisms and multithreaded model to solve real world problems	K3
4	Build Java applications with I/O packages, string classes, Collections and generics concepts	K5
5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications	K5

6.Course Code and Name : CS3311 DATA STRUCTURES LABORATORY	
CO Statements	**Knowledge Level**
At the end of this course, the students will be able to:	
1	Implement Linear data structure algorithms.	K5
2	Implement applications using Stacks and Linked lists.	K5
3	Implement Binary Search tree and AVL tree operations.	K5
4	Implement graph algorithms	K5
5	Analyze the various searching and sorting algorithms.	K4

7.Course Code and Name : CS3381 OBJECT ORIENTED PROGRAMMING LABORATORY	
CO Statements	**Knowledge Level**
On completion of this course, the students will be able to	
1	Design and develop java programs using object oriented programming concepts	K5
2	Develop simple applications using object oriented concepts such as package, exceptions	K5
3	Implement multithreading, and generics concepts	K5
4	Create GUIs and event driven programming applications for real world problems	K5
5	Implement and deploy web applications using Java	K5

8.Course Code and Name :CS3361 DATA SCIENCE LABORATORY	
CO Statements	**Knowledge Level**
On completion of this course, the students will be able to	
1	Make use of the python libraries for data science	K3
2	Make use of the basic Statistical and Probability measures for data science.	K3
3	Perform descriptive analytics on the benchmark data sets.	K3
4	Perform correlation and regression analytics on standard data sets	K3
5	Present and interpret data using visualization packages in Python.	K4

9.Course Code and Name :GE3361 PROFESSIONAL DEVELOPMENT	
CO Statements	**Knowledge Level**
On completion of this course, the students will be able to	

1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements	K3
2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding	K3
3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.	K3

SEMESTER 04

1.Course Code and Name : CS3452 THEORY OF COMPUTATION

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Construct automata theory using Finite Automata	K5
2	Write regular expressions for any pattern	K5
3	Design context free grammar and Pushdown Automata	K5
4	Design Turing machine for computational functions	K5
5	Differentiate between decidable and undecidable problems	K2

2.Course Code and Name : CS3491 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Use appropriate search algorithms for problem solving	K3
2	Apply reasoning under uncertainty	K3
3	Build supervised learning models	K5
4	Build ensembling and unsupervised models	K5
5	Build deep learning neural network models	K5

3.Course Code and Name : CS3492 DATABASE MANAGEMENT SYSTEMS

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Construct SQL Queries using relational algebra	K5
2	Design database using ER model and normalize the database	K5
3	Construct queries to handle transaction processing and maintain consistency of the database	K5
4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database	K2
5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.	K2

4.Course Code and Name : CS3401 ALGORITHMS

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Analyze the efficiency of algorithms using various frameworks	K4
2	Apply graph algorithms to solve problems and analyze their efficiency.	K3
3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems	K3
4	Use the state space tree method for solving problems.	K3

5	Solve problems using approximation algorithms and randomized algorithms	K3

5.Course Code and Name : CS3451 INTRODUCTION TO OPERATING SYSTEMS

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Analyze various scheduling algorithms and process synchronization.	K4
2	Explain deadlock prevention and avoidance algorithms.	K2
3	Compare and contrast various memory management schemes.	K2
4	Explain the functionality of file systems, I/O systems, and Virtualization	K2
5	Compare iOS and Android Operating Systems.	K2

6.Course Code and Name : GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	K2
2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.	K2
3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	K2
4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.	K2
5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	K2

7.Course Code and Name : CS3461 OPERATING SYSTEMS LABORATORY

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Define and implement UNIX Commands.	K2
2	Compare the performance of various CPU Scheduling Algorithms.	K2
3	Compare and contrast various Memory Allocation Methods.	K2
4	Define File Organization and File Allocation Strategies.	K2
5	Implement various Disk Scheduling Algorithms.	K2

8.Course Code and Name : CS3481 DATABASE MANAGEMENT SYSTEMS LABORATORY

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Create databases with different types of key constraints.	K5
2	Construct simple and complex SQL queries using DML and DCL commands.	K5
3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development	K3
4	Create an XML database and validate with meta-data (XML schema).	K5
5	Create and manipulate data using NOSQL database.	K5

SEMESTER 05

1.Course Code and Name : CS3591 COMPUTER NETWORKS

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		

1	Explain the basic layers and its functions in computer networks.	K2
2	Understand the basics of how data flows from one node to another.	K2
3	Analyze routing algorithms.	K4
4	Describe protocols for various functions in the network.	K2
5	Analyze the working of various application layer protocols.	K4

2.Course Code and Name : CS3501 COMPILER DESIGN

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Understand the techniques in different phases of a compiler.	K2
2	Design a lexical analyser for a sample language and learn to use the LEX tool.	K2
3	Apply different parsing algorithms to develop a parser and learn to use YACC tool	K3
4	Understand semantics rules (SDT), intermediate code generation and run-time environment.	K2
5	Implement code generation and apply code optimization techniques.	K5

3.Course Code and Name : CB3491 CRYPTOGRAPHY AND CYBER SECURITY

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities	K2
2	Apply the different cryptographic operations of symmetric cryptographic algorithms	K3
3	Apply the different cryptographic operations of public key cryptography	K3
4	Apply the various Authentication schemes to simulate different applications.	K3
5	Understand various cyber crimes and cyber security.	K2

4.Course Code and Name : CS3551 DISTRIBUTED COMPUTING

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Explain the foundations of distributed systems	K2
2	Solve synchronization and state consistency problems	K5
3	Use resource sharing techniques in distributed systems	K3
4	Apply working model of consensus and reliability of distributed systems	K3
5	Explain the fundamentals of cloud computing	K2

5.Course Code and Name : CCS340 CYBERSECURITY

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Explain the basics of cyber security, cybercrime and cyber law	K2
2	Apply intrusion prevention techniques to prevent intrusion	K2
3	Apply various tools to perform information gathering	K3
4	Apply intrusion techniques to detect intrusion	K3
5	Apply intrusion prevention techniques to prevent intrusion	K3

6.Course Code and Name : CCS366 SOFTWARER TESTING AND AUTOMATION

	CO Statements	Knowledge Level
At the end of this course, the students will be able to		
1	Understand the basic concepts of software testing and the need for software testing	K2

2	Design Test planning and different activities involved in test planning	K5
3	Design effective test cases that can uncover critical defects in the application	K5
4	Carry out advanced types of testing	K5
5	Automate the software testing using Selenium and Testing	K5

7.Course Code and Name : MX3084- DISASTERRISKREDUCTIONANDMANAGEMENT		
	CO Statements	**Knowledge Level**
At the end of this course, the students will be able to		
1	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)	K5
2	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction	K3
3	To develop disaster response skills by adopting relevant tools and technology	K5
4	Enhance awareness of institutional processes for Disaster response in the country and	K3
5	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity	K5