CURRICULUM ESSENTIALS

Department of Computer Science & Engineering

Departmental Vision

To develop responsible citizens who would 'think global and act local' and become the change agents of society to meet the challenges of future.

Departmental Mission

The mission of the Computer Science and Engineering Department is to build and sustain a high quality and broad area-based teaching and research program in computer science, to prepare students for successful professional careers both in industry, academics and as entrepreneur, and to provide service to the nation as a good human being.

Program Educational Objectives (PEO)

PEO1: Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.

PEO2: Graduates are prepared to take up Masters / Research programs.

PEO3: Graduates are prepared to be responsible computing professionals in their own area of interest.

PEO4: Graduates are prepared to be good entrepreneur and responsible social representatives.

Program Outcome (PO)

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 modelling 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 to 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 reports and 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. Specify, design, develop, test and maintain usable software systems that behave reliably and efficiently and satisfy all the requirements that customers have defined for them

PSO2. Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.

PSO3. Use professional engineering practices, strategies and tactics for the development, operation and maintenance of software.

Departmental Curriculum Structure

Curriculum for B. Tech in
Computer Science & Engineering
Under Autonomy

Sl No	Paper Code	Theory	Contact Hours /Week				Credit Points
1st Semester							
			L	T	P	Total	
1	M 101	Mathematics -I	3	1	0	4	4
2	PH 101	Physics - I	3	1	0	4	4
3	EC 101	Basic Electronics Engineering	3	1	0	4	4
4	HU 101	Communicative English	2	0	0	2	2
5	ME 101	Engineering Mechanics	3	1	0	4	4
Total of Theory						18	18
A. PRACTICAL							
6	HU191	Lang. Lab. and Seminar Presentation	0	0	2	2	1
7	PH191	Physics -I Lab	0	0	3	3	2
8	EC 191	Basic Electronics Engineering Lab	0	0	3	3	2
9	ME 192	Workshop Practice	0	0	3	3	2
B. SESSIONAL							

10	XC181	Extra Curricular Activity (NSS/ NCC)	0	0	2	2	1
Total of Practical & Sessional						13	08

2nd Semester							
Sl No	**Paper Code**	**Theory**	**Contact Hours /Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	M 201	Mathematics -II	3	1	0	4	4
2	CH 201	Chemistry	3	1	0	4	4
3	EE 201/ EC 201	Basic Electrical Engineering	3	1	0	4	4
4	CS 201	Computer Fundamentals & Principle of Computer Programming	3	1	0	4	4
5	ME 201	Engineering Thermodynamics & Fluid Mechanics	3	1	0	4	4
Total of Theory						20	20
B. PRACTICAL							
6	CS291	Computer Fundamentals & Principle of Computer Programming Lab	0	0	3	3	2
7	CH 291	Chemistry Lab	0	0	3	3	2
8	EE 291	Basic Electrical Engineering Lab (Gr.	0	0	3	3	2
9	ME 291	Engg Drawing & Graphics	0	0	3	3	2
Total of Practical						12	08
C.SESSIONAL							
10	MC 281	Soft Skill Development	0	0	2	2	0

				Contact hours				**Cr. Points**
			3rd Semester					
<u>SL No</u>	<u>Type</u>	<u>Code</u>	<u>A. THEORY</u>	L	T	P	Total	
1	BS	M(CSE)301	Mathematics-III	3	1	0	4	4
2	BS	PH301	Physics-II	3	0	0	3	3
3	ES	EE(CSE) 301	Circuit Theory and Network	3	0	0	3	3
4	PC	CS301	Data Structures	3	0	0	3	3
5	PC	CS302	Digital Electronics and Computer Organization	3	0	0	3	3
			Total Theory				16	16
B. PRACTICAL								
6	BS	PH391	Physics-II Lab	0	0	3	3	2
7	ES	EE(CSE) 391	Circuit Theory and Network Lab	0	0	3	3	2
8	PC	CS391	Data Structures Lab	0	0	3	3	2
9	PC	CS392	Digital Electronics and Computer Organization Lab	0	0	3	3	2
			Total Practical				12	8
C. SESSIONAL								

10	HU	HU381	Technical Report writing and Language Practice Lab	0	0	2	2	1
			Total				**30**	**25**

4th Semester								
							Contact hours	**Cr. Points**
SL No	**Type**	**Code**	**A. THEORY**	**L**	**T**	**P**	**Total**	
1	BS	M(CSE)401	Numerical Methods and Statistics	3	0	0	3	3
2	HS	HU401	Environmental science	2	0	0	2	2
3	PC	CS401	Computer Architecture	3	0	0	3	3
4	PC	CS402	Design and Analysis of Algorithms	3	0	0	3	3
5	PC	CS 403	Formal Language And Automata Theory	3	0	0	3	3
Total Theory							14	14

B. PRACTICAL

				L	T	P	Total	Cr. Points
6	BS	M(CSE)491	Numerical Methods and Statistics Lab	0	0	3	3	2
7	PC	CS491	Computer Architecture Lab	0	0	3	3	2
8	PC	CS492	Algorithms Lab	0	0	3	3	2
9	PC	CS493	Programming with C++ Lab	1	0	2	3	2
Total Practical							12	8

C. MANDATORY COURSES

				L	T	P	Total	Cr. Points
10	MC	MC 481	Technical Communication & Soft Skills	0	0	3	3	2 Unit
Total							29	22

5TH SEMESTER								
				Contact hours				**Cr. Points**
SL No	**Type**	**Code**	**A. THEORY**	**L**	**T**	**P**	**Total**	
1	HS	HU 501	Economics for Engineers	2	0	0	2	2
2	PC	CS501	Computer Graphics	3	0	0	3	3
3	PC	CS502	Operating System	3	0	0	3	3
4	PC	CS503	Data Base Management System	3	0	0	3	3
5	FE	CS 504	Object Oriented Programming using Java	3	0	0	3	3

			Multimedia Technology Communication Engineering					
6	PE	CS505	A. Operations Research B. Computational Geometry C. Digital Signal Processing	3	0	0	3	3
Total Theory							17	17
			B. PRACTICAL					
7	PC	CS591	Computer Graphics Lab	0	0	3	3	2
8	PC	CS592	Operating System Lab	0	0	3	3	2
9	PC	CS 593	Data Base Management System Lab	0	0	3	3	2
10	FE	CS594	Object Oriented Programming Lab Multimedia Technology Lab Communication Engineering Lab	**0**	**0**	3	3	2
11		CS 581	Mini Project	0	0	3	3	2
Total Practical							15	10
C. MANDATORY COURSES								
12	MC	MC581	General Aptitude /Foreign Language	0	0	3	3	2 Unit
Total							**35**	**27**

6TH SEMESTER								
				Contact hours				Cr. Points
SL No	Type	Code	A. THEORY	L	T	P	Total	
1	PC	CS601	Computer Network	3	0	0	3	3
2	PC	CS602	Microprocessor and Microcontroller	3	0	0	3	3
3	PC	CS603	Software Engineering	3	0	0	3	3
4	PE	CS604	Compiler Design Robotics Simulation and modeling	3	0	0	3	3
5	FE	CS605	A. Pattern Recognition B. Distributed Operating System C. Distributed Database D. Computer Vision	3	0	0	3	3
6	FE	CS606	A. Data Warehousing and Data Mining B. Digital Image Processing C. E-commerce and ERP	3	0	0	3	3
Total Theory							18	18
B. PRACTICAL								
7	PC	CS691	Computer Network Lab	0	0	3	3	2
8	PC	CS692	Microprocessor and Microcontroller Lab	0	0	3	3	2

9	PC	CS693	Software Engineering Lab	0	0	3	3	2
Total Practical							**9**	**6**
C. SESSIONAL								
10		CS681	Group Discussion and Seminar	0	0	3	3	2
Total							**30**	**26**

7TH SEMESTER								
					Contact hours			**Cr. Points**
SL No	**Type**	**Code**	**A. THEORY**	**L**	**T**	**P**	**Total**	
1	HS	HU701	Values & Ethics in Profession	2	0	0	2	2
2	PC	CS701	Artificial Intelligence	3	0	0	3	3
3	PE	CS702	A. Soft Computing B. Natural Language Processing C. Web technology	3	0	0	3	3
4	PE	CS703	A. Cloud Computing B. Data Analytics C. Sensor Network and IOT	3	0	0	3	3
5	PE	CS704	A. Distributed Algorithms B. Bio-informatics C. Cryptography and Network	3	0	0	3	3

SL No	Type	Code		L	T	P	Total	Cr. Points
			Security				14	14
Total Theory							14	14
B. PRACTICAL								
6	PC	CS791	Artificial Intelligence Lab	0	0	3	3	2
7	PE	CS792	A. Soft Computing Lab B. Natural Language Processing Lab C. Web Technology Lab	0	0	3	3	2
8		CS795	Project-1	0	0	3	3	2
Total Practical							9	6
C. SESSIONAL								
9		CS781	Industrial Training	0	0	0	0	2
Total Sessional								
D. MANDATORY COURSES								
10	MC	MC781	Technical Skill Development	0	0	3	3	2Unit
Total							**26**	**22**

8TH SEMESTER								
				Contact hours				**Cr. Points**
			8th Semester	**L**	**T**	**P**	**Total**	
SL No	**Type**	**Code**	**A. THEORY**					
1	HS	HU801	A. Principle of Management B. Organizational	2	0	0	2	2

			Behavior					
2	PE	CS801	A. Mobile Computing B. Human computer Interaction C. Cyber Law and Security Policy D. VLSI Design	3	0	0	3	3
3	PE	CS802	A. Parallel Computing B. Machine Learning C. Real Time Operating System and Embedded System D. Advanced Computer Architecture	3	0	0	3	3
Total Theory							8	8
B. PRACTICAL								
4	PC	CS891	Design lab	0	0	3	3	2
5		CS892	Project 2	0	0	12	9	6
6		CS893	Seminar Presentation	0	0	3	3	2
Total Practical							18	12
C. SESSIONAL								
7		CS881	Grand Viva	0	0	0	0	4
Total							**26**	**22**
Grand Total								**198**

Course Outcome (CO)

Course Code: M101
Course Name: Mathematics I

On completion of the course students will be able to

M101.1	Able to explain the applicability of determinant and matrix in the different types of engineering problem.
M101.2	Able to apply Mean value theorems & expansion of function in engineering field.
M101.3	Able to apply the area & volume integrals in different engineering problems.
M101.4	Able to apply vector concepts in numerous engineering experiments and problems.
M101.5	Application of improper integral in engineering field.

Course Code: PH101
Course Name: Physics I

On completion of the course students will be able to

PH101.1	Able to explain the different types of vibrations.
PH101.2	Able to apply the laser principles to holography.
PH101.3	Able to analyze the problems of black body radiation.
PH101.4	Able to evaluate X-ray in different experiments/processes.
PH101.5	Apply conceptual understanding of the physics to general real-world situations.

Course Code: EC101
Course Name: Basic Electronics Engineering

On completion of the course students will be able to

EC101.1	Able to identify semiconductor materials, draw energy band diagram, distinguish between intrinsic and extrinsic semiconductor, calculate drift and diffusion current component.
EC101.2	Able to characterize semiconductors, diodes, transistors and operational amplifiers.
EC101.3	Able to know the application of Diode, BJT & OPAMP.
EC101.4	Able to identify functions of digital multimeter, cathode ray oscilloscope and transducers in the measurement of physical variables.
EC101.5	Able to use digital oscilloscopes, meters and waveform generators in laboratory.

Course Code: HU101
Course Name: Communicative English

On completion of the course students will be able to

HU101.1	Able to understand basic grammar principles.
HU101.2	Able to write clear and coherent passages, effective letters for job application and complaints, technical reports.
HU101.3	Able to enhance reading comprehension.
HU101.4	Able to comprehend English speech sound system, stress and intonation.
HU101.5	Demonstrate some control of essential grammatical structures with occasional inconsistencies

Course Code: ME101
Course Name: Engineering Mechanics

On completion of the course students will be able to

ME101.1	Able to determine the resultant force and moment for a given system of forces.
ME101.2	Able to analyze planar and spatial systems to determine the forces in members of trusses, frames and problems related to friction.
ME101.3	Able to calculate the motion characteristics of a body subjected to a given force system.
ME101.4	Able to determine the deformation of a shaft and understand the relationship between different material constants.
ME101.5	Determine the centroid and second moment of area.

Course Code: HU191
Course Name: Language Laboratory & Seminar Presentation

On completion of the course students will be able to

HU191.1	Able to understand advanced skills of Technical Communication in English through Language Laboratory.
HU191.2	Able to apply listening, speaking, reading and writing skills in societal and professional life.
HU191.3	Able to demonstrate the skills necessary to be a competent Interpersonal communicator.
HU191.4	Able to analyse communication behaviours.
HU191.5	Able to adapt to multifarious socio-economical and professional arenas with the help of effective communication and interpersonal skills.

Course Code: PH191
Course Name: Physics - I Laboratory

On completion of the course students will be able to

PH191.1	Able to use CRO, Signal generator, spectrometer, polarimeter and GM counter for making measurements.
PH191.2	Able to test optical components using principles of interference and diffraction of light.
PH191.3	Able to determine the selectivity parameters in electrical circuits.
PH191.4	Able to determine the width of narrow slits, spacing between close rulings using lasers and appreciate the accuracy in measurements.
PH191.5	Demonstrate an ability to make physical measurements and understand the limits of precision in measurements.

Course Code: EC191
Course Name: Basic Electronics Engineering Laboratory

On completion of the course students will be able to

EC191.1	Knowledge of Electronic components such as Resistors, Capacitors, Diodes, Transistors measuring equipment like DC power supply, Multimeter, CRO, Signal generator, DC power supply.
EC191.2	Analyze the characteristics of Junction Diode, Zener Diode, BJT & FET and different types of Rectifier Circuits.
EC191.3	Determination of input-offset voltage, input bias current and Slew rate, Common-mode Rejection ratio, Bandwidth and Off-set null of OPAMPs.
EC191.4	Able to know the application of Diode, BJT & OPAMP.
EC191.5	Able to use digital oscilloscopes, meters and waveform generators in laboratory.

Course Code: ME192
Course Name: Workshop Practice

On completion of the course students will be able to

ME192.1	Identify the hand tools and instruments
ME192.2	Understand the working principles of machine tools and their operations.
ME192.3	Comprehend the safety measures required to be taken while using the tools and apply and experiment on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.
ME192.4	Apply suitable tools for machining processes including turning, facing, thread cutting and tapping.
ME192.5	Apply basic electrical engineering knowledge for house wiring practice.

Department of Computer Science and Engineering

Course Code: XC181
Course Name: Extra-Curricular Activity
(NSS/ NCC)

On completion of the course students will be able to

XC181.1	Able to up-to-date, in-depth knowledge of an academic specialty, as well as a broad range of cultural and general knowledge.
XC181.2	Able to exhibit the professional knowledge and accepting ethical responsibility to the problems of industry and society.
XC181.3	Able to develop Character, Comradeship, Discipline, Leadership, Secular Outlook, Spirit of Adventure and Ideals of Selfless Service amongst the Youth of the Country;
XC181.4	To manage projects in multi-disciplinary environment
XC181.5	Able to develop confidence for self-education for lifelong learning of advancements being happened around the world.

Course Code: M201
Course Name: Mathematics II

On completion of the course students will be able to

M201.1	Able to apply the knowledge of first order differentiation in engineering field.
M201.2	Able to analyse type of higher order equations and apply in numerous engineering application.
M201.3	Able to analyze graph theory concepts
M201.4	Explaining the behavior of electrical, communication and electromagnetic field
M201.5	Able for application of Laplace Transform for solving various engineering problems.

Course Code: CH201
Course Name: Chemistry

On completion of the course students will be able to

CH201.1	Able to apply fundamental concepts of thermodynamics in different engineering applications.
CH201.2	Able to prepare composites, Synthetic polymers, etc.
CH201.3	Able to apply the knowledge of chemical reactions to industries and scientific and technical fields.
CH201.4	Able to apply the knowledge of corrosion to prevent corrosion in different industries.
CH201.5	Capable to evaluate theoretical and practical aspects relating to the transfer of the production of chemical products from laboratories to the industrial scale, in accordance with environmental considerations.

Course Code: EE201
Course Name: Basic Electrical Engineering

On completion of the course students will be able to

EE201.1	Able to understand basics of R , L , C circuit elements and voltage and current sources.
EE201.2	Able to Appreciate and analyze DC , AC and magnetic circuits using KVL and KCL.
EE201.3	Able Understand working principle of various analogue electrical measuring instruments.
EE201.4	Able to Comprehend the working of DC machines, transformers and induction Motors.
EE201.5	Function on multi-disciplinary teams

Course Code: CS201
Course Name: Computer Fundamentals &
Principle of Computer Programming

On completion of the course students will be able to

CS201.1	Able to develop algorithms for mathematical and scientific problems.
CS201.2	Able to understand the components of computing systems.
CS201.3	Able to choose data types and structures to solve mathematical and scientific problem.
CS201.4	Able to develop modular programs using control structures.
CS201.5	Able to develop the programming skills in general, this will create the backbone of programming concepts in future.

Course Code: ME201
Course Name: Engineering Thermodynamics &
Fluid Mechanics

On completion of the course students will be able to

ME201.1	Able to apply fundamental concepts of thermodynamics to engineering applications.
ME201.2	Able to estimate thermodynamic properties of substances in gas and liquid states
ME201.3	Capable to determine thermodynamic efficiency of various energy related processes.
ME201.4	Able to Know the basic principles of fluid mechanics
ME201.5	Able to analyze fluid flow problems with the application of the momentum and energy equations

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Course Code: CS291
Course Name: Computer Fundamentals & Principle of Computer Programming Lab

On completion of the course students will be able to

CS291.1	Learn the concept of DOS system commands and editor.
CS291.2	Learn the concept of simple programs with decision taking concept.
CS291.3	Learn the concepts of programs with loop control structure.
CS291.4	Learn the concept of programs with Arrays, Pointers, Structures, Union and Files.
CS291.5	Implement the concepts of Files through C programming Languages.

Course Code: CH291
Course Name: Chemistry Lab

On completion of the course students will be able to

CH291.1	Able to analyse different parameters of water considering environmental issues.
CH291.2	Able to operate different types of instruments for estimation of small quantities chemicals used in industries and scientific and technical fields.
CH291.3	Able to work as an individual also as an team member
CH291.4	Able to synthesize Nano and polymer materials.
CH291.5	Capable to design innovative experiments applying the fundamentals of chemistry

Course Code: EE291
Course Name: Basic Electrical Engineering
Laboratory

On completion of the course students will be able to

EE291.1	Able to determine of B/H curve of a magnetic material.
EE291.2	Able to analyze AC series, parallel and balanced three phase circuits.
EE291.3	Able to determine Voltage regulation and efficiency of a single phase transformer by direct loading.
EE291.4	Able to control the Speed of a DC motor by varying: - a. field current with armature voltage kept constant b. armature voltage with field current kept constant.
EE291.5	Able to study the Reversal of direction of rotation of a three phase induction motor.

Course Code: ME291
Course Name: Engineering Drawing & Graphics

On completion of the course students will be able to

ME291.1	Able to draw Orthographic projections of Lines, Planes, and Solid.
ME291.2	Able to construct Isometric Scale, Isometric Projections and Views.
ME291.3	Able to draw Sections of various Solids including Cylinders, cones, prisms and pyramids.
ME291.4	Able to draw projections of lines, planes, solids, isometric projections and sections of solids including Cylinders, cones, prisms and pyramids using AutoCAD.
ME291.5	Able to graphically construct and understand the importance of mathematical curves in Engineering applications

Course Code: MC281
Course Name: Soft Skill Development

On completion of the course students will be able to

MC281.1	Able to handle emotions including tolerance and behavioural responses, building positive friendships and bonding with peers and classmates, learning to show understanding and to demonstrate respect for the opinions, personal space and beliefs of others.
MC281.2	Able to develop the self-motivation, raised aspirations and belief in one's own abilities, defining and committing to achieving one's goals.
MC281.3	Able to assess the requirements of a task, identifying the strengths within the team, utilising the diverse skills of the group to achieve the set objective, awareness of risk/safety.
MC281.4	Able to demonstrate the clear briefing and listening skills, not being afraid to ask for help and support when necessary.
MC281.5	Able to develop the employability skills – time and resource management, conflict resolution, teaching and mentoring others

Course Code: M(CSE)301
Course Name: Mathematics-III

On completion of the course students will be able to

M(CSE)301.1	Able to apply the knowledge of Fourier series and transform in engineering problems like finding the frequency of wave propagation.
M(CSE)301.2	Able to apply the knowledge of Complex Analysis viz the Cauchy Residue Theorem to evaluate integrals and sum series.
M(CSE)301.3	Able to solve the stochastic model of engineering problems using the idea of different kind of engineering problems.
M(CSE)301.4	Able to know that differential equation is a very important mathematical model of many problems in the application of engineering.
M(CSE)301.5	Able to utilize theories and methods learned in the course to analyze and solve a differential equation.

Course Code: PH301
Course Name: Physics II

On completion of the course students will be able to

PH301.1	Able to understand the concepts and applications of electrostatics.
PH301.2	Gain complete knowledge and applications of magnetostatics & time varying field.
PH301.3	Gain brief idea of electromagnetic field theory.
PH301.4	Able to understand the concepts and applications of quantum mechanics.
PH301.5	Able to understand the concepts and applications of statistical mechanics.

Course Code: EE(CSE) 301
Course Name: Circuit Theory and Network

On completion of the course students will be able to

EE(CSE) 301.1	Able to understand basics electrical circuits with nodal and mesh analysis.
EE(CSE) 301.2	Able to appreciate electrical network theorems.
EE(CSE) 301.3	Able to apply Laplace Transform for steady state and transient analysis.
EE(CSE) 301.4	Able to determine different network functions.
EE(CSE) 301.5	To analyse the various three phase circuits star and delta connections

Course Code: CS301
Course Name: Data Structures

On completion of the course students will be able to

CS301.1	Able to access how the choices of data structure & algorithm methods impact the performance of program.
CS301.2	Able to Solve problems based upon different data structure & also write programs.
CS301.3	Able to Choose an appropriate data structure for a particular problem.
CS301.4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing
CS301.5	Compare and contrast the benefits of dynamic and static data structures implementations

Course Code: CS302
Course Name: Digital Electronics and Computer Organization

On completion of the course students will be able to

CS302.1	Define the basics of organizational and architectural issues of a digital computer.
CS302.2	Explain the working principles of computer design, measuring and summarizing the performance of computer system.
CS302.3	Explain the development of computer systems and examine the operation of the major building blocks of a computer system and performance enhancements for each component.
CS302.4	Identify and examine digital logic circuits, embedded microprocessor-based and microcontroller-based systems, including assembly and high-level language programs in electronics and computer science that meets desired specifications and requirements.
CS302.5	Identify, investigate and formulate computer and electronics engineering problems.

Course Code: PH391
Course Name: Physics - II Laboratory

On completion of the course students will be able to

PH391.1	Revise and learn the use of CRO, CRT and other necessary tools.
PH391.2	To learn application and demonstration of experiments on quantum physics.
PH391.3	To learn the application and demonstration of experiments on thermoelectricity and di-electric.
PH391.4	To learn the application and demonstration of experiments on solid state physics and electromagnetism.
PH391.5	To demonstrate the experiments on atomic physics.

Course Code: EE(CSE) 391
Course Name: Circuit Theory & Network
Laboratory

On completion of the course students will be able to

EE(CSE) 391.1	Explain the concept of circuit laws and network theorems and apply them to laboratory measurements.
EE(CSE) 391.2	Become proficient with computer skills (e.g., TSPICE and PSPICE) for the analysis and design of circuits.
EE(CSE) 391.3	Understand Transient Response in Series & Parallel Resonant circuits, R-L & R-C Networks;
EE(CSE) 391.4	Understand of Impedance (Z), and Admittance (Y) parameters of Two-port networks.
EE(CSE) 391.5	Generate different signals in MATLAB which can be processed through a system later on.

Course Code: CS391
Course Name: Data Structures Lab

On completion of the course students will be able to

CS391.1	Choose appropriate data structure as applied to specified problem definition.
CS391.2	Handle operations like searching, insertion, deletion, traversing mechanism on various data structures.
CS391.3	Have practical knowledge on the applications of data structures.
CS391.4	Able to store, manipulate and arrange data in an efficient manner by implementing the algorithms by doing coding
CS391.5	Able to implement queue and stack using arrays and linked list. Implementation of circular queue ,binary tree and binary search tree and the traversing through the binary tree are the other things to be done by them

Course Code: CS392
**Course Name: Digital Electronics and Computer
Organization Lab**

On completion of the course students will be able to

CS392.1	Describe the structure and functioning of a digital computer, including its overall system architecture, operating system, and digital component.
CS392.2	Explain the fundamental concepts and techniques used in digital electronics and computer organization.
CS392.3	Examine the structure of various number systems and apply the knowledge in digital design and computer organization.
CS392.4	Design and organize various combinational and sequential circuits.
CS392.5	Identify and locate various hazards and timing problems in a digital design and develop skill to build, and troubleshoot digital circuits.

Course Code: HU381
**Course Name: Technical Report writing and
Language Practice Lab**

On completion of the course students will be able to

HU381.1	Build confidence in speaking, reading and writing English professionally.
HU381.2	Understanding communication techniques and learning the method of technical writing.
HU381.3	To be prompt in public speaking spontaneously on given subjects.
HU381.4	To preserve proper body language.
HU381.5	To have confidence to participate in any kind of given conversation and deliver presentations

Course Code: M(CSE)401
Course Name: Numerical Methods and Statistics

On completion of the course students will be able to

M(CSE)401.1	Able to get the knowledge of General Basic ideas of environment.
M(CSE)401.2	Able to understand basics of finite precision arithmetic, conditioning of problems and stability of numerical algorithms.
M(CSE)401.3	Able to solve numerically a scalar nonlinear equation.
M(CSE)401.4	Able to solve dense systems of linear equations and have a working knowledge of LU factorizations for these problems.
M(CSE)401.5	Able to use the method of lines to solve basic partial differential equations.

Course Code: HU401
Course Name: Environmental science

On completion of the course students will be able to

HU401.1	Able to numerically approximate functions with polynomials.
HU401.2	Understand the Environmental degradation, Elements of ecology, Structure and function of ecosystem, Biogeochemical Cycle and Biodiversity.
HU401.3	Able to know the Air pollution and control Atmospheric Composition.
HU401.4	Able to get the knowledge of Energy balance, Green house effects, Lapse rate, Atmospheric dispersion, Definition of pollutants and contaminants, Primary and secondary pollutants, Depletion Ozone layer.
HU401.5	Understand the Water Pollution and Control, Land Pollution, Noise Pollution and Environmental Management.

Course Code: CS401
Course Name: Computer Architecture

On completion of the course students will be able to

CS401.1	Learn pipeline concepts with a prior knowledge of stored program methods.
CS401.2	Learn about memory hierarchy and mapping techniques.
CS401.3	Study of parallel architecture and interconnection network.
CS401.4	Consider various techniques of instruction-level parallelism, including superscalar execution, branch prediction, and speculation, in design of high-performance processors.
CS401.5	Learn from additional topics in computer architecture, such as multi-core processors, thread-level parallelism, and warehouse computing.

Course Code: CS402
Course Name: Design Analysis and Algorithm

On completion of the course students will be able to

CS402.1	Understanding basic ideas about algorithms
CS402.2	Apply design principles and concepts to algorithm design
CS402.3	Analyze the efficiency of algorithms using time and space complexity theory.
CS402.4	Develop efficient algorithms for simple computational tasks
CS402.5	Apply the algorithms and design techniques to solve problems;

Course Code: CS 403
Course Name: Formal Language and Automata
Theory

On completion of the course students will be able to

CS403.1	Understand and apply formal notations via regular expressions and grammars, as well as their recognizers.
CS403.2	Master context free languages, pushdown automata, and Turing recognizable languages.
CS403.3	Discuss virtual machines and intermediate languages tradeoffs.
CS403.4	Be exposed to a broad overview of the theoretical foundations of computer science.
CS403.5	Be familiar with thinking analytically and intuitively for problem solving situations in related areas of theory in computer science.

Course Code: M(CSE)491
**Course Name: Numerical Methods and Statistics
Lab**

On completion of the course students will be able to

M(CSE)491.1	Able to numerically approximate functions with polynomials.
M(CSE)491.2	Able to understand basics of finite precision arithmetic, conditioning of problems and stability of numerical algorithms.
M(CSE)491.3	Able to solve numerically a scalar nonlinear equation.
M(CSE)491.4	Able to solve dense systems of linear equations and have a working knowledge of LU factorizations for these problems.
M(CSE)491.5	Able to use the method of lines to solve basic partial differential equations.

Course Code: CS491
Course Name: Computer Architecture Lab

On completion of the course students will be able to

CS491.1	Able to review of digital logic components.
CS491.2	Able to review of digital logic circuit analysis, design, and optimization.
CS491.3	Able to review of digital logic circuit design and simulation tools.
CS491.4	Students will demonstrate knowledge of micro architecture features
CS491.5	Students will demonstrate knowledge of assembly programming optimization

Course Code: CS492
Course Name: Algorithms Lab

On completion of the course students will be able to

CS492.1	Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees and various Sorting algorithms.
CS492.2	Design new algorithms or modify existing ones for new applications and able to analyze the space & time efficiency of most algorithms.
CS492.3	Discuss various algorithm design techniques for developing algorithms.
CS492.4	Discuss various searching, sorting and graph traversal algorithms.
CS492.5	Understand NP completeness and identify different NP complete problems.

Course Code: CS493
Course Name: Programming with C++ Lab

On completion of the course students will be able to

CS493.1	Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.
CS493.2	Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
CS493.3	At the end of the course students will able to simulate the problem in the subjects like Operating system, Computer networks and real world problems.
CS493.4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
CS493.5	Understand dynamic memory management techniques using pointers, constructors, destructors, etc

Course Code: MC481
Course Name: Technical Communication & Soft Skills

On completion of the course students will be able to

MC481.1	Able to handle emotions including tolerance and behavioural responses, building positive friendships and bonding with peers and classmates, learning to show understanding and to demonstrate respect for the opinions, personal space and beliefs of others.
MC481.2	Able to develop the self-motivation, raised aspirations and belief in one's own abilities, defining and committing to achieving one's goals.
MC481.3	Able to assess the requirements of a task, identifying the strengths within the team, utilising the diverse skills of the group to achieve the set objective, awareness of risk/safety.
MC481.4	Create, select and apply appropriate techniques and modern IT tools
MC481.5	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Course Code: HU501
Course Name: Economics for Engineers

On completion of the course students will be able to

HU501.1	Be able to perform and evaluate present worth, future worth and Annual worth analyses on one of more economic alternatives.
HU501.2	Be able to perform and evaluate payback period and capitalized Cost on one or more economic alternatives.
HU501.3	Be able to carry out and evaluate benefit/cost, life cycle and Breakeven analyses on one or more economic alternatives.
HU501.4	Analyze, understand and manage critical financial situations
HU501.5	Understand the various parameters like resource availability, depreciation, cost accounting etc and analyze project economic feasibility

Course Code: CS501
Course Name: Computer Graphics

On completion of the course students will be able to

CS501.1	Identify and explain the core concepts of computer graphics.
CS501.2	Illustrate and discover a selection of classic raster algorithms such as Bresenham's line-drawing algorithm in 2D space, scan-line conversion of polygons and Cohen-Sutherland two-dimensional clipping algorithm on points in world-coordinate space,.
CS501.3	Apply linear affine transformations such as scaling, translation, and rotation to points in two- and three-dimensional space and analyze the effects of such transformations on the points in a rendered scene
CS501.4	Analyze and Define and perform the perspective and orthographic projections on points and scenes in three-dimensional space and to solve graphics programming issues, including 3D transformation, objects modelling, lighting, textures, and ray tracing
CS501.5	Interpret the mathematics, underlying two and three-dimensional interpolating curves and surfaces

Course Code: CS502
Course Name: Operating System

On completion of the course students will be able to

CS502.1	To understand the role and responsibilities of OS in the computer system.
CS502.2	To explain how the OS deals with process management, memory management and secondary storage management.
CS502.3	To analyze process synchronization and deadlocks.
CS502.4	To apply the knowledge about OS, for the Linux operating system case study.
CS502.5	Use disk management and disk scheduling algorithms for better utilization of external memory.

Course Code: CS503
Course Name: Database Management System

On completion of the course students will be able to

CS503.1	Construct an Entity Relationship (E-R) Diagram for an application.
CS503.2	Create a normalized relational database model
CS503.3	Answer real world queries to generate reports from it.
CS503.4	Determine whether the transaction satisfies the ACID properties.
CS503.5	Organize and maintain the database of an organization.

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Course Code: CS504A
Course Name: Object Oriented Programming using Java

On completion of the course students will be able to

CS504A.1	Understand the principles of object-oriented programming.
CS504A.2	Understand concepts of data encapsulation, inheritance, and polymorphism to large-scale software using Java.
CS504A.3	Understand the concepts of Graphical User Interfaces (GUI) in Java using applet.
CS504A.4	Be able to simulate the problem in the subjects like Operating system, Computer networks and real world problems.
CS504A.5	Understand generic programming, templates, file handling.

Course Code: CS504B
Course Name: Multimedia Technology

On completion of the course students will be able to

CS504B.1	Identify different media; representations of different multimedia data and data formats.
CS504B.2	Analyze various compression techniques.
CS504B.3	Compare various audio and video file formats.
CS504B.4	Apply different coding technique for solving real world problems.
CS504B.5	Choose optical storage media suitable for multimedia applications.

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Course Code: CS504C
Course Name: Communication Engineering

On completion of the course students will be able to

CS504C.1	Improving fluency through regular practice and speaking drills
CS504C.2	Students will learn the concept of impart advanced skills of Technical Communication in English through Language Lab.
CS504C.3	Practice Sessions to 1st Semester UG students of Engineering &Technology
CS504C.4	Communicate through speaking, listening, reading, writing, viewing and representing
CS504C.5	Students will learn the concept of enable them to communicate confidently and competently in English Language in all spheres.

Course Code: CS505B
Course Name: Computational Geometry

On completion of the course students will be able to

CS505B.1	Familiarization with fundamentals of computational geometry techniques.
CS505B.2	To understand Voronoi Diagrams and related algorithms.
CS505B.3	To Understand Motion Planning and approximation methods related problems and algorithms.
CS505B.4	To know polygon triangulation algorithms.
CS505B.5	To understand the concept of linear programming techniques and algorithms.

Course Code: CS505C
Course Name: Digital Signal Processing

On completion of the course students will be able to

CS505C.1	Able to obtain different Continuous and Discrete time signals
CS505C.2	Ability to calculate discrete time domain and frequency domain of signals using discrete Fourier series and Fourier transform.
CS505C.3	Ability to develop Fast Fourier Transform (FFT) algorithms for faster realization of signals and systems.
CS505C.4	Ability to demonstrate the impacts of finite word length effects in filter design.
CS505C.5	Ability to design different kinds of interpolator and decimator

Course Code: CS591
Course Name: Computer Graphics Lab

On completion of the course students will be able to

CS591.1	To implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques.
CS591.2	Design scan conversion problems using C++ programming.
CS591.3	Understand the concepts of different type of geometric transformation of objects in 2D and 3D.
CS591.4	Apply clipping and filling techniques for modifying an object.
CS591.5	Understand the practical implementation of modeling, rendering, viewing of objects in 2D

Course Code: CS592
Course Name: Operating System Lab

On completion of the course students will be able to

CS592.1	To make students able to implement CPU scheduling algorithms and Bankers algorithm used for deadlock avoidance and prevention.
CS592.2	Students will also be able to implement page replacement and memory management algorithms.
CS592.3	Apply UNIX/LINUX operating system commands.
CS592.4	Understand different UNIX/LINUX shell scripts and execute various shell programs.
CS592.5	Implement virtualization by installing Virtual Machine software.

Course Code: CS593
Course Name: Data Base Management System Lab

On completion of the course students will be able to

CS593.1	To understand the basic concepts regarding database, know about query processing and techniques involved in query optimization and understand the concepts of database transaction and related database facilities including concurrency control, backup and recovery.
CS593.2	To understand the introductory concepts of some advanced topics in data management like distributed databases, data warehousing, deductive databases and be aware of some advanced databases like partial multimedia and mobile databases.
CS593.3	To understand the difference between DBMS and advanced DBMS and use of advanced database concepts and become proficient in creating database queries.
CS593.4	Define database system concepts and apply normalization to the database.
CS593.5	Describe different transaction processing concepts and use different concurrency control techniques.

Course Code: CS594A
Course Name: Object Oriented Programming Lab

On completion of the course students will be able to

CS594A.1	To familiarize the students with language environment
CS594A.2	To implement various concepts related to language.
CS594A.3	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
CS594A.4	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
CS594A.5	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.

Course Code: CS594B
Course Name: Multimedia Technology Lab

On completion of the course students will be able to

CS594B.1	To understand about various latest interactive multimedia devices, the basic concepts about images and image formats.
CS594B.2	To understand about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
CS594B.3	To develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications surrounding the emergence of multimedia technology.
CS594B.4	plan experiments to test user perception of multimedia tools
CS594B.5	analyse the effects of scale and use on both presentation and lower level requirements

Course Code: CS594C
Course Name: Communication Engineering Lab

On completion of the course students will be able to

CS594C.1	Improving fluency through regular practice and speaking drills
CS594C.2	Expanding vocabulary by at least 300 words through assignments and class work and
CS594C.3	Developing a solid of understanding of basic grammar structures - like nouns, verbs and adjectives - through class reading and speaking tasks.
CS594C.4	Communicate through speaking, listening, reading, writing, viewing and representing
CS594C.5	Learn and reflect on their learning through their study of English.

Course Code: CS581
Course Name: Mini Project

On completion of the course students will be able to

CS581.1	To understand the programming language concepts and basics of Software Development Life Cycle model for the implementation of the project.
CS581.2	To plan, analyze, design and implement a software project using SDLC model.
CS581.3	To learn to work as a team and to focus on getting a working project done within a stipulated period of time.
CS581.4	Gain confidence to implement small ideas into real life working software projects through testing.
CS581.5	To learn to distribute the workload efficiently among the team members through proper co-ordination and

Course Code: CS601
Course Name: Computer Network

On completion of the course students will be able to

CS601.1	Demonstrate the networking strategies.
CS601.2	Examine the protocols operation of various layers of Data networks.
CS601.3	Identify the technical issues related to networking technologies.
CS601.4	Design and build a network using routers.
CS601.5	Understand the transport layer and applications protocols.

Course Code: CS602
Course Name: Microprocessor and Microcontroller

On completion of the course students will be able to

CS602.1	Understand the architecture and programming of the microprocessor.
CS602.2	Understand the basic idea about the instruction set and data transfer
CS602.3	Understand the interfacing and various applications of microprocessor.
CS602.4	Understand and demonstrate the advanced microprocessors.
CS602.5	Develop strong skills in research, analysis and interpretation of complex information.

Course Code: CS603
Course Name: Software Engineering

On completion of the course students will be able to

CS603.1	Identify the customer requirements And
CS603.2	Help to understand the software design and coding techniques.
CS603.3	Understand the concept o project management.
CS603.4	Apply the suitable testing methodology.
CS603.5	Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project

Course Code: CS604A
Course Name: Compiler Design

On completion of the course students will be able to

CS604A.1	Design lexical and syntax analyzer phases of complier.
CS604A.2	Demonstrate the basic notions and techniques for programming language translation
CS604A.3	Demonstrate the basic notions and techniques for intermediate code generation.
CS604A.4	Generate and program a small compiler or interpreter.
CS604A.5	To understand how linker and loader create an executable program from an object module created by assembler and compiler

Course Code: CS604B
Course Name: Robotics

On completion of the course students will be able to

CS604B.1	Understand basic structure of industrial robot and its components, tooling, sensors, actuators and artificial intelligence in robotics.
CS604B.2	Apply analytical techniques and basic principles of robotic design for solving the kinematics of a robot manipulator
CS604B.3	Compare and analyze robotics for various industrial applications.
CS604B.4	Make comparison, recommend and justify usage of robotic systems with relevant sensors and vision systems
CS604B.5	Modify, design and develop various RPLs, AI and expert systems for industrial applications of robotic systems.

Course Code: CS604C
Course Name: Simulation and Modelling

On completion of the course students will be able to

CS604C.1	Introduce students to the simulation and modeling techniques
CS604C.2	Provide students with opportunities to develop basic simulation and modeling skills with respect to carrying out research projects using any simulation method on the computer
CS604C.3	Construct difference-based computer models
CS604C.4	Examine mathematical representations of functions - Describe and utilize linear and nonlinear functions to model empirical data. Visualize empirical data and the fitting function using a computational tool.
CS604C.5	Complete a capstone modeling project that identifies a problem, develops a mathematical representation and transforms it to a computational model. Document the development and implementation of the model and present in oral and written form.

Course Code: CS605A
Course Name: Pattern Recognition

On completion of the course students will be able to

CS605A.1	To explain the concept of pattern recognition and its different phases.
CS605A.2	To discuss on the idea of feature extraction and different approaches towards prototype selection.
CS605A.3	To illustrate the Support Vector Machine and its application in real life problem solving.
CS605A.4	Understand the model for an image analysis process.
CS605A.5	Provide knowledge of models, methods and tools used to solve regression, classification, feature selection and density estimation problems

Course Code: CS605B
Course Name: Distributed Operating System

On completion of the course students will be able to

CS605B.1	To identify the core concepts of distributed systems
CS605B.2	To examine how existing systems have applied the concepts of distributed systems
CS605B.3	To apply these concepts to develop sample systems.
CS605B.4	Explain the various features of distributed OS like Unix, Linux, windows etc
CS605B.5	Recognize file system interface, protection and security mechanisms

Course Code: CS605C
Course Name: Distributed Database

On completion of the course students will be able to

CS605C.1	Describe database management system internals. Understand and describe internal algorithms in detail.
CS605C.2	Identify and be able to use recent and advanced database techniques (e.g. in concurrency control, buffer management, and recovery
CS605C.3	Decide on configuration issues related to database operation and performance. Identify which parameters are suitable and what are its implications.
CS605C.4	Analyze and optimize transactional code, identifying causes of possible anomalies and correct them.
CS605C.5	Decide on optimization issues given a known database workload, by manipulating indexes, choosing more adequate data types, and modifying queries.

Course Code: CS605D
Course Name: Computer Vision

On completion of the course students will be able to

CS605D.1	Understand fundamental image processing techniques required for computer vision
CS605D.2	Understand 3D vision techniques
CS605D.3	Implement boundary tracking techniques
CS605D.4	Apply chain codes and other region descriptors to perform shape analysis
CS605D.5	Apply Hough Transform for line, circle, and ellipse detections and develop applications using computer vision techniques

Course Code: CS606A
Course Name: Data Warehousing and Data Mining

On completion of the course students will be able to

CS606A.1	Learn implementation of classical algorithms in data mining and data warehousing;
CS606A.2	Learn to identify the application area of algorithms, and apply them.
CS606A.3	Learn to deploy the idea of data mining in real applications.
CS606A.4	Describe the usage of data mining tools
CS606A.5	Discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms

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Course Code: CS606B
Course Name: Digital Image Processing

On completion of the course students will be able to

CS606B.1	Demonstrated understanding of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
CS606B.2	Demonstrated understanding of 2D Fourier transform concepts, including the 2D DFT and FF, and their use in frequency domain filtering.
CS606B.3	Demonstrated understanding of spatial filtering techniques, including linear and nonlinear methods.
CS606B.4	Demonstrated understanding of the fundamental image enhancement algorithms such as histogram modification, contrast manipulation, and edge detection.
CS606B.5	Demonstrated programming skills in digital image processing related problems

Course Code: CS606C
Course Name: E-commerce and ERP

On completion of the course students will be able to

CS606C.1	An ability to identify why information systems are so important today for business and management.
CS606C.2	Assess the impact of the Internet and Internet technology on business electronic commerce and electronic business.
CS606C.3	Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.
CS606C.4	Student will detect the effects of e-commerce on supply chains and ERP.
CS606C.5	Student will describe how IT support supply chain through ERP.

Course Code: CS691
Course Name: Computer Network Lab

On completion of the course students will be able to

CS691.1	To design and implement small size network and to understand various networking commands.
CS691.2	To provide the knowledge of various networking tools and their related concepts
CS691.3	To understand various application layer protocols for its implementation in client/server environment
CS691.4	Understand the TCP/IP configuration for Windows and Linux
CS691.5	Learn the major software and hardware technologies used on computer networks

Course Code: CS692
Course Name: Microprocessor and Microcontroller Lab

On completion of the course students will be able to

CS692.1	Provide practical hands-on experience with microprocessor applications and interfacing techniques.
CS692.2	Understand microprocessor kit, knowledge of instruction set.
CS692.3	Understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller to solve the real life applications.
CS692.4	Understand real mode Memory addressing and ability to interface various devices to the microprocessor.
CS692.5	Use standard test and measurement equipment to evaluate digital interfaces.

Course Code: CS693
Course Name: Software Engineering Lab

On completion of the course students will be able to

CS693.1	Understand and apply the concept of software engineering.
CS693.2	Knowledge about software development life cycle and the problem articulation.
CS693.3	Should be able to apply the project management and analysis principles to S/W project development.
CS693.4	Should be able to apply the design & testing principles to S/W project development
CS693.5	Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.

Course Code: CS681
Course Name: Group Discussion and Seminar

On completion of the course students will be able to

CS681.1	To help students develop their soft skills and equip them with the requisite skills to make their communication effective.
CS681.2	To develop other skills this will make the transition from college to workplace, Smoother and help them to excel in their jobs.
CS681.3	To enhance students performance at placement interviews, group discussion and other recruitment process.
CS681.4	Understand and participate in Group Discussions and related activities.
CS681.5	Students will engage with works that are widely held to be significant in the field of study, while recognizing cultural diversity and the ever-changing nature of what is regarded as important.

Course Code: HU701
Course Name: Values & Ethics in Profession

On completion of the course students will be able to

HU701.1	To inculcate Ethics and Human Values into the young minds.
HU701.2	To develop moral responsibility and mould them as best professionals.
HU701.3	To create ethical vision and achieve harmony in life.
HU701.4	Carefully read scholarly debates about moral issues so as to extract claims and evaluate the soundness of the supporting arguments
HU701.5	Develop and critically examine one's personal moral views in light the primary ethical traditions and competing moral theories within those traditions

Course Code: CS701
Course Name: Artificial Intelligence

On completion of the course students will be able to

CS701.1	Get the concepts of Artificial intelligence
CS701.2	Get the concepts of Intelligent Agents And issues in the design of search programs.
CS701.3	Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms).
CS701.4	Get the concepts of And Knowledge & reasoning of predicate logic and Representing knowledge using rules, Probabilistic reasoning.
CS701.5	Have working knowledge in Prolog in order to write simple Prolog programs and explore more sophisticated Prolog code on their own.

Course Code: CS702A
Course Name: Soft Computing

On completion of the course students will be able to

CS702A.1	Efficiently and reliably implement the algorithm
CS702A.2	Describe principles of more general optimization algorithms
CS702A.3	Able to apply the concept of supervised and unsupervised learning in real application.
CS702A.4	Able to understand the difference between learning and programming and explore practical applications of Neural Networks (NN) and Fuzzy Logic.
CS702A.5	Able to appreciate the importance of optimizations and its use in computer engineering fields and other domains.

Course Code: CS702B
Course Name: Natural Language Processing
On completion of the course students will be able to

CS702B.1	Able to understand the fundamental concept of NLP, Regular Expression, Finite State Automata along with the concept and application of word tokenization, normalization, sentence segmentation, word extraction, spell checking in the context of NLP.
CS702B.2	Able to understand the concept of Morphology such as Inflectional and Derivational Morphology and different morphological parsing techniques including FSTs.
CS702B.3	Able to understand the concepts related to language modeling with introduction to N-grams, chain rule, smoothing, Witten Bell discounting, backoff, deleted interpolation, spelling and word prediction and their evaluation along with the concept of Markov chain, HMM, Forward and Viterbi algorithm, POS tagging.
CS702B.4	Able to understand the concept of different text classification techniques, sentiment analysis, concepts related to CFG in the context of NLP.
CS702B.5	Able to understand the concept of lexical semantics, lexical dictionary such as WordNet, lexical computational semantics, distributional word similarity and concepts related to the field of Information Retrieval in the context of NLP.

Course Code: CS702C
Course Name: Web Technology

On completion of the course students will be able to

CS702C.1	Develop client-server applications in local area network.
CS702C.2	Demonstrate the basics of web services.
CS702C.3	Develop web based online application with database connectivity
CS702C.4	Develop e-commerce based secured web application
CS702C.5	Demonstrate common types of vulnerabilities and attacks in web applications, and defence against them

Course Code: CS703A
Course Name: Cloud Computing

On completion of the course students will be able to

CS703A.1	Classify and describe the architecture and taxonomy of cloud computing.
CS703A.2	Characterize the distinctions between Infrastructure, Platform and Software as a Service (IaaS, PaaS, SaaS) abstractions.
CS703A.3	Understand Public , Private and Hybrid Clouds, and analyze their advantages and disadvantages
CS703A.4	Understand virtualization and their role in elastic computing
CS703A.5	Understand the use of load balancing techniques for stateful and stateless applications.

Course Code: CS703B
Course Name: Data Analytics

On completion of the course students will be able to

CS703B.1	Understand the current challenges in processing data
CS703B.2	Aware of the technologies available for handling data
CS703B.3	Understand how data are generated in different industries
CS703B.4	Understand the ideas behind data mining methods targeted for data
CS703B.5	Analyse datasets through the use of application software

Course Code: CS703C
Course Name: Sensor Network and IOT

On completion of the course students will be able to

CS703C.1	Architect sensor networks for various application setups.
CS703C.2	Determine suitable medium access protocols and radio hardware.
CS703C.3	Provision quality of service, fault-tolerance, security and other dependability requirements while coping with resource constraints.
CS703C.4	Able to design energy efficient protocols
CS703C.5	Able to virtualized sensor nodes in practical environment.

Course Code: CS704A
Course Name: Distributed Algorithms

On completion of the course students will be able to

CS704A.1	Understand the principles of parallel and distributed algorithms
CS704A.2	Understand and account for models, limitations, and fundamental concepts in the area of message passing and shared memory concurrency, and apply this understanding to example systems and algorithms
CS704A.3	Apply, adapt and design algorithms for execution in parallel and distributed settings
CS704A.4	Analyze the algorithms for correctness, reliability, security, and performance
CS704A.5	Able to design soft and hard real time application.

Course Code: CS704B
Course Name: Bioinformatics

On completion of the course students will be able to

CS704B.1	Know concepts of genomics and proteomics,
CS704B.2	Describe bioinformatics algorithms such as dynamic programming, hidden markov models and monte carlo.
CS704B.3	Utilize bioinformatics tools such as Pymol, Blast, and ClustalW.
CS704B.4	Code solutions to bioinformatics problems utilizing tools such as R, biopython, bioperl.
CS704B.5	Do research areas in bioinformatics.

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Course Code: CS704C
Course Name: Cryptography & Network Security

On completion of the course students will be able to

CS704C.1	Demonstrate the concept and functionalities of Network Security Application network threats
CS704C.2	Analyze, employ and review the cryptographic algorithms and protocols
CS704C.3	Demonstrate, review and develop the existing and new concepts of software security and trusted systems, management issues and e-mail security.
CS704C.4	Design and implement algorithms for Internet security for solving engineering problems
CS704C.5	Implement network security algorithms digital signatures in various security applications.

Course Code: CS791
Course Name: Artificial Intelligence Lab

On completion of the course students will be able to

CS791.1	Learn the concept of simple programming using PROLOG.
CS791.2	Learn the concept of AI based programs using PROLOG.
CS791.3	Learn the concepts of programs with LISP.
CS791.4	To have an understanding of the basic issues of knowledge representation and blind and heuristic search, as well as an understanding of other topics such as minimax, resolution, etc. that play an important role in AI programs.
CS791.5	To have a basic understanding of some of the more advanced topics of AI such as learning, natural language processing, agents and robotics, expert systems, and planning.

Course Code: CS792A
Course Name: Soft Computing Lab

On completion of the course students will be able to

CS792A.1	Understand basics of fuzzy system, genetic algorithms & their relations.
CS792A.2	Learn artificial neural n/w, models and their functions.
CS792A.3	To solve real life problems using Fuzzy Logics.
CS792A.4	To design different Artificial Neural Network models for solving real life problems.
CS792A.5	To represent and solve various real life problems using Genetic Algorithm.

Course Code: CS792B
Course Name: Natural Language Processing Lab

On completion of the course students will be able to

CS792B.1	Able to access text corpora and lexical resources and process of raw text.
CS792B.2	Able to write structured programs for categorizing and tagging of words, segmentation of sentences.
CS792B.3	Able to classify text and extract information from it.
CS792B.4	Able to analyze sentence structure and build feature based grammar.
CS792B.5	Able to analyze meaning of sentences and to manage linguistic data.

Course Code: CS792C
Course Name: Web Technology Lab

On completion of the course students will be able to

CS792C.1	Create a static website using HTML and add dynamic functionality to it by using java Script.
CS792C.2	Implement the advanced concepts of java such as servelets & jsp to create dynamic web pages & add functionality to the WebPages by using XML.
CS792C.3	Gain confidence to create dynamic website on real world problems.
CS792C.4	Utilize the concepts of JavaScript and Java
CS792C.5	Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

Course Code: CS795
Course Name: Project-1

On completion of the course students will be able to

CS795.1	Learn about different software development process models and software engineering principles and develop an ability to apply them to software design of real life problems.
CS795.2	Plan, analyze, design and implement a software project using programming languages like Java, ASP, PHP etc.
CS795.3	Gain confidence at having conceptualized, designed and implemented a working major project with their team.
CS795.4	Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project
CS795.5	Able to prepare SRS document, design document, test cases and software configuration management and risk management related document.

Course Code: CS781
Course Name: Industrial Training

On completion of the course students will be able to

CS781.1	Able to increase exposure to industries.
CS781.2	Able to be accustomed with working environment in industries.
CS781.3	Able to get the opportunity to work with live projects.
CS781.4	Able to apply prior acquired knowledge in problem solving.
CS781.5	Able to analyze a given engineering problem, identify an appropriate problem solving methodology and implement it.

Course Code: MC781
Course Name: Technical Skill Development

On completion of the course students will be able to

MC781.1	Able to design live websites.
MC781.2	Able to design software.
MC781.3	Able to design some Android App.
MC781.4	Able to design some research based algorithms.
MC781.5	To propose a structured and pragmatic solution to address the lack of relevant skills amongst the current and potential workforce.

Course Code: HU801A
Course Name: Principle of Management

On completion of the course students will be able to

HU801A.1	Understand the major internal features of a business system and the environment in which it operates.
HU801A.2	Demonstrate critical thinking when presented with managerial problems and express their views and opinions on managerial issues in an articulate way.
HU801A.3	Understand how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.
HU801A.4	Identify and explain the importance of the management process and identify some of the key skills required for the contemporary management practice.
HU801A.5	Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.

Course Code: HU801B
Course Name: Organizational Behavior

On completion of the course students will be able to

HU801B.1	Define leadership and analyze key related theories.
HU801B.2	Explain organizational culture and describe its dimensions of various organizational designs
HU801B.3	Appreciate the role that individual characteristics, personality and values on behaviour in organizations
HU801B.4	Discuss attitude measurement and job satisfaction characteristics and the implementation of organizational change.
HU801B.5	Summarize and discuss perceptions, learning, individual decision and motivation theories.

Course Code: CS801A
Course Name: Mobile Computing

On completion of the course students will be able to

CS801A.1	Analyze the working of modern communication technologies.
CS801A.2	Demonstrate the various routing algorithms for both infrastructure based and ad hoc networks.
CS801A.3	Develop mobile content applications using Wireless Application Protocols.
CS801A.4	Design and build a mobile computing environment using heterogeneous wireless technologies
CS801A.5	Identify the technical issues related to recent mobile computing environment.

Course Code: CS801B
Course Name: Human computer Interaction

On completion of the course students will be able to

CS801B.1	Think critically about human computer interaction
CS801B.2	Incorporate interaction design theory as well as elements of cognitive psychology when designing, critiquing or talking about software and/or hardware.
CS801B.3	Design mock-ups and carry out user and expert evaluation of interfaces.
CS801B.4	Formulate general ways in which to test hypotheses about human computer interaction.
CS801B.5	Recognize how a computer system may be modified to include human diversity.

Course Code: CS801C
Course Name: **Cyber Law and Security Policy**

On completion of the course students will be able to

CS801C.1	Demonstrate the concept and functionalities of cyber Security Application, network threats
CS801C.2	Analyze, employ and review the tools, techniques and protocols
CS801C.3	Demonstrate, review and develop the existing and new concepts of software security and trusted systems, management issues and e-mail security.
CS801C.4	Design and implement algorithms for Internet security for solving engineering problems
CS801C.5	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Course Code: CS801D
Course Name: VLSI Design

On completion of the course students will be able to

CS801D.1	To be aware about the trends in semiconductor technology, and how it impacts scaling and performance.
CS801D.2	Able to learn Layout, Stick diagrams, Fabrication steps, Static and Switching characteristics of inverters
CS801D.3	Synthesis of digital VLSI systems from register-transfer or higher level descriptions in hardware design languages.
CS801D.4	To understand MOS transistor as a switch and its capacitance
CS801D.5	Extensive use of Mentor Graphics CAD tools for IC design, simulation, and layout verification

Course Code: CS802A
Course Name: Parallel Computing

On completion of the course students will be able to

CS802A.1	Explain how large scale parallel system architecture and how massive parallelism are implemented in accelerator architectures.
CS802A.2	Write parallel programs for large-scale parallel systems, shared address space platforms, and heterogeneous platforms;
CS802A.3	Design efficient parallel algorithms and applications.
CS802A.4	The course is a comprehensive study of modern parallel computer architectures and parallel processing techniques and their applications from basic concepts to state-of-the-art computer systems.
CS802A.5	It provides in-depth coverage of fundamentals, design complexity, power, reliability and performance coupled with treatment of parallelism at all levels.

Course Code: CS802B
Course Name: Machine Learning

On completion of the course students will be able to

CS802B.1	Understand the fundamental issues and challenges of machine learning: data, model selection, model complexity etc.
CS802B.2	Understand a wide variety of Machine learning algorithms
CS802B.3	Understand the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
CS802B.4	Be able to design and implement various machine learning algorithms in a range of real-world applications.
CS802B.5	Understand how to perform evaluation of learning algorithms and model selection

Course Code: CS802B
Course Name: Real Time Operating System and
Embedded System

On completion of the course students will be able to

CS802C.1	To present the mathematical model of the system
CS802C.2	To develop real-time algorithm for task scheduling
CS802C.3	To understand the working of real-time operating systems and real-time database.
CS802C.4	To work on design and development of protocols related to real-time communication.
CS802C.5	Meet the participant with basics of real-time operating systems and to give the participant knowledge and skills necessary to develop software for embedded computer systems using a real-time operating system

Course Code: CS802D
Course Name: Advanced Computer Architecture

On completion of the course students will be able to

CS802D.1	Understand basic computer organization, design and micro-operations.
CS802D.2	Understand and demonstrate CPU functionality and computer arithmetic.
CS802D.3	Understand and demonstrate various methods and techniques of memory organization.
CS802D.4	Understand and demonstrate the advanced hardware-based techniques for exploiting instruction level parallelism.
CS802D.5	Apply the learned knowledge to conduct computer architecture research using performance simulators.

Department of Computer Science and Engineering

Course Code: CS891
Course Name: Design lab

On completion of the course students will be able to

CS891.1	Able to design live websites.
CS891.2	Able to design software.
CS891.3	Design some Android App.
CS891.4	Able to design some research based algorithms.
CS891.5	Able to design Web based application in multidisciplinary application.

Course Code: CS892
Course Name: Project 2

On completion of the course students will be able to

CS892.1	Learn about different software development process models and software engineering principles and develop an ability to apply them to software design of real life problems.
CS892.2	Plan, analyze, design and implement a software project using programming languages like Java, ASP, PHP etc.
CS892.3	Gain confidence at having conceptualized, designed and implemented a working major project with their team.
CS892.4	Understand the fundamental principles of Software Project management & will also have a good knowledge of responsibilities of project manager and how to handle these.
CS892.5	Be familiar with the different methods and techniques used for project management.

Course Code: CS893
Course Name: Seminar Presentation

On completion of the course students will be able to

CS893.1	Ability to develop skills in presentation and discussion of research topics in a public forum.
CS893.2	Able to get exposure to a variety of research projects and activities in order to enrich their academic experience
CS893.3	Ability to develop and enhance leadership skills.
CS893.4	Able to improving communication skills, presentation skills and other soft skills.
CS893.5	Able to improving presentation skills and other soft skills.

Course Code: CS881
Course Name: Grand Viva

On completion of the course students will be able to

CS881.1	Able to evaluate overall technical knowledge and industry readiness.
CS881.2	Able to go under a virtual environment of technical interview.
CS881.3	Able to analyze various application of Computer Science & Engineering in real life problem solving.
CS881.4	Able to analyze student's learning and understanding during the course of their post graduate programme
CS881.5	Prepare the students to face interview both at the academic and the industrial sector

JIS GROUP

Educational Initiatives

WHY US ?

COMMITMENT

COMPASSION

RESPECT

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