NiT

R-21

CURRICULUM ESSENTIALS
Handbook on Outcome Based Education

INFORMATION TECHNOLOGY

NARULA INSTITUTE OF TECHNOLOGY
WWW.NIT.AC.IN

Institute Mission

- To establish continuously improving academic ambience in the Institute in order to prepare the students with beyond curriculum knowledge, creativity, innovation, problem solving abilities, teamwork, communication skills etc. for their holistic development.
- To collaborate with Institutes of higher education, Professional Societies, R&D and Industrial organisations for continuous improvement of academic, research environment in the Institute and to build a strong Industry-Institute interface.
- To promote and nurture entrepreneurial and innovative quality of the students providing proper education, training and supportive facilities so that future entrepreneurs emerge with flying colors.
- To strengthen quality and knowledge-base of faculty through faculty development programmes for continuous upgradation to remain in tune with dynamically changing technology.
- To become a responsible contributor in the socio-economic development of the society through excellence in education and research.

Institute Vision

To make the Institute excellent in technological education and research by imparting equitable, inclusive, ethical, flexible and multidisciplinary knowledge to budding technologists to serve the society.

Institute Quality Policy

- Adoption of appropriate standards and practices for good governance, to bring in transparency of all operations and thereby improve credibility at all levels.
- Industry-ready professionals to be developed through interactive teaching learning process involving state of the art class rooms, laboratories, libraries, corporate exposure and innovative project work.
- Higher studies/research for faculty & staff to be encouraged for up gradation of knowledge through participation in Quality Improvement Programs, Seminars, Workshops, Webinars etc.
- Laboratory facilities would be upgraded in emerging areas to promote R&D activities including participation in Govt. and Industry funded projects.
- Industrial consultancy to be carried out in an effective manner for developing sense of accomplishment.
- Interaction with Professional Societies would be encouraged for the professional growth and development of the students, faculties and staff for mutual benefit.
- NBA Accreditation for all AICTE approved programs to be obtained at the earliest and maintained on a long-term basis.
- The innovative and entrepreneurial skills of the students to be nurtured through Innovation & Incubation center, finally culminating in start-ups.

Department Mission

B.Tech. in Information Technology

M1: To address multi-various aspects of academic growth in Information Technology

M2: To disseminate advanced concepts for pursuing research and development oriented activity in Information and Communication Technology

M3: To guide the students to become successful IT Professionals with relevant skills

M4: To motivate the students to explore their capabilities for utilizing there intellectual potential

Department Vision

B.Tech. in Information Technology

To provide an appropriate ambience for creating IT professionals of international standards who would be able to cope with situational challenges in the emerging field of information technology with a new view to serving IT society in particular and human society in general.

Program Educational Objects (PEOs)

B.Tech. in Information Technology

- **PEO1.** The graduates of the program will be able to analyze, design and invent computing solutions for multidisciplinary engineering and scientific challenges.

- **PEO2:** The graduates of the program will be able to pursue a successful career in industry, academia, research or public sector by the acquired skill and knowledge as a competent professional.

- **PEO3:** The graduates of the program will be able to exhibit an exceptional and active participation and involvement in Research and Development leading to innovations and optimized solutions.

- **PEO4:** The graduates of the program will be able to engage in lifelong learning for professional advancement and effective communication of the technical information and Perform effectively in multi-disciplinary and multi-cultural environments with valued professionalism and ethical practices within organization and society at national and international level.

Program outcomes (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities withan understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. *Communication:* Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

B.Tech. in Information Technology

PSO1. Design, develop and maintain state-of-the-art hardware and software system and applications.

PSO2. Classify, analyze and extend different aspects of Information Technology for solving real life problems.

PSO3. Identify and design solutions for futuristic problems through the proficiency acquired.

Curriculum Structure

1ST YEAR, 1ST SEMESTER

Sl. No	Subject Category	Subject Code	Subject Name	L	T	P	Total	Total Credits
THEORY								
1	BS	M101	MATHEMATICS-I	3	1	0	4	4
2	BS	PH101	PHYSICS-I	3	1	0	4	4
3	ES	EC101	BASIC ELECTRONICS ENGINEERING	3	1	0	4	4
4	ES	ME101	ENGINEERING MECHANICS	3	1	0	4	4
5	HS	HU101	COMMUNICATIVE ENGLISH	2	0	0	2	2
Total no. of Theory:								**18**
PRACTICAL								
6	BS	PH191	PHYSICS-I LAB	0	0	3	3	2
7	ES	EC191	BASIC ELECTRONICS ENGINEERING LAB	0	0	3	3	2
8	ES	ME192	WORKSHOP PRACTICE	0	0	3	3	2
9	HS	HU191	LANGUAGE LAB & SEMINAR PRESENTATION	0	0	3	3	1
Total no. of Practical:								**7**
SESSIONAL								
10	HS	XC181	EXTRA CURRICULAR ACTIVITY (NSS/NCC)	0	0	2	2	1
TOTAL								**26**

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	BS	M201	MATHEMATICS-II	3	1	0	4	4
2	BS	CH201	CHEMISTRY	3	1	0	4	4
3	ES	EE201	BASIC ELECTRICAL ENGINEERING	3	1	0	4	4
4	ES	CS201	COMPUTER FUNDAMENTALS AND PRINCIPLE OF COMPUTER PROGRAMMING	3	1	0	4	4
5	ES	ME201	ENGINEERING THERMODYNAMICS AND FLUID MECHANICS	3	1	0	4	4
Total no. of Theory:								20
PRACTICAL								
6	BS	CH291	CHEMISTRY LAB	0	0	3	3	2
7	ES	CS291	COMPUTER FUNDAMENTALS AND PRINCIPLE OF COMPUTER PROGRAMMING LAB	0	0	3	3	2
8	ES	EE291	BASIC ELECTRICAL ENGINEERING LAB	0	0	3	3	2
9	ES	ME291	ENGINEERING DRAWING AND GRAPHICS	0	0	3	3	2
Total no. of Practical:								8
SESSIONAL								
10	MC	MC281	SOFT SKILL DEVELOPMENT	0	0	3	3	2 units
TOTAL								28

2ND YEAR, 3RD SEMESTER

Sl. No	Subject Category	Subject Code	Subject Name	Contact hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	BS	M(IT)301	MATHEMATICS- III	3	1	0	4	4
2	BS	PH(IT)301	PHYSICS- II	3	0	0	3	3
3	BS	M(IT)302	NUMERICAL METHODS AND STATISTICS	3	0	0	3	3
4	ES	EC(IT)303	ANALOG AND DIGITAL ELECTRONICS	3	0	0	3	3
5	PC	IT301	DATA STRUCTURE & ALGORITHM	3	1	0	4	4
Total no. of Theory:								**17**
PRACTICAL								
6	BS	PH(IT)391	PHYSICS-II LAB	0	0	3	3	2
7	BS	M(IT)392	NUMERICAL METHODS AND STATISTICS LAB	0	0	3	3	2
8	ES	EC(IT)393	ANALOG & DIGITAL ELECTRONICS LAB	0	0	3	3	2
9	PC	IT391	DATA STRUCTURE LAB	0	0	3	3	2
Total no. of Practical:								**8**
SESSIONAL								
10	HS	HU381	TECHNICAL REPORT WRITING AND LANGUAGE PRACTICE	0	0	3	3	1
TOTAL								**26**

2ND YEAR, 4TH SEMESTER

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	HS	HU401	ENVIRONMENTAL SCIENCE	2	0	0	2	2
2	PC	IT401	COMPUTER ORGANIZATION & ARCHITECTURE	3	1	0	4	4
3	PC	IT402	COMMUNICATION ENGINEERING & CODING THEORY	3	0	0	3	3
4	PC	IT403	FORMAL LANGUAGE AND AUTOMATA THEORY	3	0	0	3	3
5	PC	IT404	OBJECT ORIENTED PROGRAMMING USING JAVA	3	0	0	3	3
Total no. of Theory:								**15**
PRACTICAL								
6	PC	IT491	COMPUTER ORGANIZATION & ARCHITECTURE LAB	0	0	3	3	2
7	PC	IT492	COMMUNICATION ENGINERING & CODING THEORY LAB	0	0	3	3	2
8	PC	IT494	OBJECT ORIENTED PROGRAMMING LAB	0	0	3	3	2
Total no. of Practical:								**6**
SESSIONAL								
9	MC	MC481	TECHNICAL SKILL DEVELOPMENT	0	0	3	3	2 units
TOTAL								**21**

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	PC	IT501	DESIGN ANALYSIS OF ALGORITHM	3	1	0	4	4
2	PC	IT502	SOFTWARE ENGINEERING	3	1	0	4	4
3	PC	IT503	OPERATING SYSTEM	3	1	0	4	4
4	PE	IT504A IT504B IT504C	PROGRAMMING PRACTICE WITH C++ ARTIFICIAL INTELLIGENCE OPERATIONS RESEARCH	3	1	0	4	4
5	HS	HU505	INDUSTRIAL AND FINANCIAL MANAGEMENT	2	0	0	2	2
Total no. of Theory:								**18**
PRACTICAL								
6	PC	IT591	DESIGN ANALYSIS OF ALGORITHM LAB	0	0	3	3	2
7	PC	IT592	SOFTWARE ENGINEERING LAB	0	0	3	3	2
8	PC	IT 593	OPERATING SYSTEM LAB	0	0	3	3	2
9	PE	IT 594A IT 594B IT 594C	PROGRAMMING PRACTICE WITH C++ LAB ARTIFICIAL INTELLIGENCE LAB OPERATIONS RESEARCH LAB	0	0	3	3	2
Total no. of Practical:								**8**
SESSIONAL								
10	PW	IT581	MINI PROJECT - I	0	0	4	4	2
TOTAL:								**28**

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	PC	IT 601	DATABASE MANAGEMENT SYSTEM	3	1	0	4	4
2	PC	IT 602	WEB TECHNOLOGY	3	0	0	3	3
3	PC	IT 603	COMPUTER NETWORKING	3	1	0	4	4
4	PE	IT 604 A IT 604 B IT 604 C IT 604 D	ERP INFORMATION & CODING THEORY MICROPROCESSOR & MICROCONTROLLER DIGITAL IMAGE PROCESSING	3	1	0	4	4
5	OE	ECE(IT)605A IT 605 B IT 605 C IT 605 D IT 605 E IT 605 F	DIGITAL SIGNAL PROCESSING COMPILER DESIGN GREEN COMPUTING SOFT COMPUTING PROJECT MANAGEMENT HUMAN RESOURCE MANAGEMENT	3	0	0	3	3
Total no. of Theory:								**18**
PRACTICAL								
6	PC	IT691	DATABASE MANAGEMENT SYSTEM LAB	0	0	3	3	2
7	PC	IT692	WEB TECHNOLOGY LAB	0	0	3	3	2
8	PC	IT693	COMPUTER NETWORKING LAB	0	0	3	3	2
9	PC	IT694	SYSTEM ENGINEERING LAB	0	0	3	3	2
Total no. of Practical:								**8**
SESSIONAL								
10	PW	IT682	MINI PROJECT - II	0	0	4	4	2
11	MC	MC681	SEMINAR/GD/ PRESENTATION SKILL/ FOREIGN LANGUAGE	0	0	3	3	2 units
TOTAL								**28**

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	**T**	**P**	**Total**	
THEORY								
1	PC	IT701	E - COMMERCE	3	0	0	3	3
2	PE	IT702A IT702B IT702C	COMPUTER GRAPHICS AND MULTIMEDIA PATTERN RECOGNITION INTERNET TECHNOLOGY	3	0	0	3	3
3	PE	IT703 A IT703 B IT703 C	CLOUD COMPUTING DISTRIBUTED SYSTEMS DATA WAREHOUSING AND DATA MINING	3	0	0	3	3
4	OE	IT704A EE(IT)704B ECE(IT)704C IT704D	MODELLING AND SIMULATION CONTROL SYSTEM MICROELECTRONICS AND VLSI DESIGN MOBILE COMMUNICATION	3	0	0	3	3
Total no. of Theory:								**12**
PRACTICAL								
5	PC	IT791	E – COMMERCE LAB	0	0	3	3	2
6	PE	IT792A IT792B IT792C	COMPUTER GRAPHICS & MULTIMEDIA LAB PATTERN RECOGNITION LAB INTERNET TECHNOLOGY LAB	0	0	3	3	2
Total no. of Practical:								**4**
SESSIONAL								
7	PW	IT781	INDUSTRIAL TRAINING	0	0	0	4 weeks	2
8	PW	IT782	PROJECT-I	0	0	6	6	3
9	MC	IT783	SEMINAR/GD/ PRESENTATION SKILL/ FOREIGN LANGUAGE	0	0	3	3	2 units
TOTAL								**21**

Sl. No	Subject Category	Subject Code	Subject Name	Contact Hours/Week				Total Credits
				L	T	P	Total	
THEORY								
1	PE	IT801A IT801B IT801C IT801D	ADVANCED COMPUTER ARCHITECTURE CRYPTOGRAPHY AND NETWORK SECURITY NATURAL LANGUAGE PROCESSING BIO-INFORMATICS	3	0	0	3	3
2	OE	IT802A IT802B IT802C IT802D	BUSINESS ANALYTICS CYBER LAW AND SECURITY POLICY ADVANCED DBMS INTERNET OF THINGS	3	1	0	4	4
3	HS	HU802	VALUES & ETHICS IN PROFESSIONS	2	0	0	2	2
Total no. of Theory:								**9**
PRACTICAL								
SESSIONAL								
4	PW	IT 881	DESIGN LAB/ INDUSTRIAL PROBLEM RELATED PRACTICAL TRAINING	0	0	3	3	2
5	PW	IT 882	PROJECT II	0	0	12	12	6
6	PW	IT 883	GRAND VIVA	0	0	0	0	3
TOTAL								**20**

STREAM   : **INFORMATION TECHNOLOGY**
SUBJECT NAME   : **MATHEMATICS–I**
SUBJECT CODE   : **M101**
YEAR   : **FIRST**
SEMESTER   : **1ˢᵗ Semester**
CONTACT HOURS : **3L + 1T**
CREDITS   : **4**

Course Outcome

On successful completion of the learning sessions of the course, the learner will be able to

CO1	Recall the distinctive characteristics of Matrix Algebra, Calculus of Single and Several Variables and Vector Analysis.
CO2	Understand the theoretical concept of Matrix Algebra, Calculus of Single and Several Variables and Vector Analysis.
CO3	Apply the principles of Matrix Algebra, Calculus of Single and Several Variables and Vector Analysis to solve various problems.
CO4	Analyze different engineering problems linked with matrix algebra, differential calculus, Integral Calculus, multivariable calculus, vector calculus
CO5	Apply different engineering problems linked with matrix algebra, differential calculus, Integral Calculus, multivariable calculus, vector calculus

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	--	--	--	--	--	--	--	--
CO2	3	3	3	2	--	--	--	--	--	--	--	--
CO3	3	3	3	2	--	--	--	--	--	--	--	--
CO4	3	3	3	2	--	--	--	--	--	--	--	--
CO5	3	3	3	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

COs	PSO1	PSO2	PSO3
M101.1	2	2	2
M101.2	2	2	2
M101.3	2	2	2
M101.4	2	2	2
M101.5	2	2	2

PAPER NAME: CHEMISTRY
PAPER CODE: CH 101
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of this course students will be able to

CO1	Able to describe the fundamental properties of atoms & molecules, atomic structure and the periodicity of elements in the periodic table
CO2	Able to apply fundamental concepts of thermodynamics in different engineering applications.
CO3	Able to apply the knowledge of water quality parameters, corrosion control & polymers to different industries.
CO4	Able to determine the structure of organic molecules using different spectroscopic techniques.
CO5	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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	1	2
CO2	2	1	3
CO3	3	1	3
CO4	2	1	3
CO5	3	1	3

PAPER NAME: BASIC ELECTRICAL ENGINEERING
PAPER CODE: EE101
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After attending the course students' would be able to

CO1	To understand Basic Electrical circuits, Power distribution and Safety measures.
CO2	Apply basic engineering knowledge to understand basics terms used in electrical ac circuits, study RLC circuits with phasor diagrams, determine impedance and admittance, power factor and power and describe and illustrate RLC resonance phenomena.
CO3	Apply basic engineering knowledge to understand basics of three phase system and determine the power by two-watt meters method
CO4	Apply basic engineering knowledge to study construction, classification, working principles, performance characteristics of dc machines, transformer and three phase induction motor.
CO5	Apply basic engineering knowledge to understand basics of power system, earthing of electrical equipment and electrical wiring.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	3	2	2
CO4	2	3	2
CO5	2	2	2

PAPER NAME: PROFESSIONAL COMMUNICATION
PAPER CODE: HSMC 101
CONTACT: 2:0:0
TOTAL CONTACT HOURS: 24
CREDIT: 2

Course Outcome:

After attending the course students' should be able to

CO1	Comprehend and communicate in English through exposure to communication skills theory and practice.
CO2	Apply the basic grammatical skills of the English language through intensive practice.
CO3	Apply/illustrate all sets of English language and communication skills in creative and effective ways in the professional sphere of their life.
CO4	Develop writing proficiency skills by writing official letters, technical report, memo, notice, minutes, agenda, resume, curriculum vitae.
CO5	Able to apply all sets of English language and communication skills in creative and effective ways in the professional sphere of their life

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12
CO1	--	--	--	--	--	2	1	--	1	1	--	--
CO2	--	--	--	--	--	2	1	--	1	1	--	--
CO3	--	--	--	--	--	2	1	--	1	1	--	--
CO4	--	--	--	--	--	2	1	--	1	1	--	--
CO5	--	--	--	--	--	2	1	--	1	1	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	1	1	1
CO2	1	1	1
CO3	2	2	1
CO4	2	2	1
CO5	2	2	1

PAPER NAME: CHEMISTRY LAB
PAPER CODE: CH191
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After attending this course, students would be able to

CO1	Operate different types of instruments for estimation of small quantities chemicals used in industries and scientific and technical fields.
CO2	Analyse and determine the composition of liquid and solid samples working as an individual and also as an team member
CO3	Analyse different parameters of water considering environmental issues
CO4	Synthesize drug and polymer materials.
CO5	Capable to design innovative experiments applying the fundamentals of chemistry

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

COs	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	3	1	1
CO3	1	2	2
CO4	2	2	2
CO5	1	2	2

PAPER NAME: BASIC ELECTRICAL ENGINEERING LAB
PAPER CODE: EE191
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Identify and use common electrical components.
CO2	Develop electrical networks by physical connection of various components and analyze the circuit behavior.
CO3	Apply and analyse the basic characteristics of transformers and electrical machines.
CO4	Able to know the application of Diode, BJT & OPAMP.
CO5	Understand working of various electronic circuits knowledge of basic electronic components of the circuits.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	1	--	--	--
CO2	3	3	3	3	--	--	--	--	1	--	--	--
CO3	3	3	3	3	--	--	--	--	1	--	--	--
CO4	3	3	3	3	--	--	--	--	1	--	--	--
CO5	3	3	3	3	--	--	--	--	1	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	3	2	2
CO4	2	3	2
CO5	2	2	2

PAPER NAME: ENGINEERING GRAPHICS & DESIGN LAB
PAPER CODE: ME192
PAPER: 0:0:3
CREDIT: 1.5

Course Outcome:

After attending the course students would be able to

CO1	Learn basics of drafting and use of drafting tools which develops the fundamental skills of industrial drawings
CO2	Know about engineering scales, dimensioning and various geometric curves necessary to understand design of machine elements
CO3	Understand projection of line, surface and solids to create the knowledge base of orthographic and isometric view of structures and machine parts
CO4	Become familiar with computer aided drafting useful to share the design model to different section of industries as well as for research & development.
CO5:	Get hands on practice of in Welding and apply various machining processes which give a lot of confidence to manufacture physical prototypes in project works

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	3	--	--	--	--	2	--	--	--
CO2	2	3	3	3	--	--	--	--	2	--	--	--
CO3	2	3	3	3	--	--	--	--	2	--	--	--
CO4	2	3	3	3	--	--	--	--	2	--	--	--
CO5	2	3	3	3	--	--	--	--	2	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	1	2
CO2	2	1	3
CO3	3	1	3
CO4	2	1	3
CO5	3	1	3

PAPER NAME: PHYSICS –I
PAPER CODE: PH 201
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome :

After attending the course students' should be able to

CO1	Describe various types mechanical resonance and its electrical equivalence
CO2	Explain basic principles of Laser, Optical fibers and various types of semiconductors
CO3	Apply superposition to explain interference and diffraction as well as apply wave mechanics to attainment of Heisenberg's uncertainty principle
CO4	Analyze importance of light as a carrier of information and examine different crystallographic structures according to their co-ordination number and packing factors
CO5	Justify the need of a quantum mechanics as remedy to overcome limitations imposed by classical physics

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	3	2
CO2	2	3	3
CO3	3	3	3
CO4	2	3	3
CO5	3	3	3

PAPER NAME: MATHEMATICS-II
PAPER CODE: M 201
CONTACT: 3:1:0
TOTAL CONTACT HOURS: 48
CREDIT: 4

Course Outcome:

On successful completion of the learning sessions of the course, the learner will be able to

CO1	Recall the distinctive characteristics of Ordinary Differential Equations, Graph Theory and Laplace Transform
CO2	Understand the theoretical workings of various algorithms related to graph theory and the theorems of differential equation and Laplace transforms.
CO3	Apply the principles of differential equation, graph theory and Laplace transforms to solve various problems.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	1	2
CO2	2	1	3
CO3	3	1	3
CO4	2	1	3
CO5	3	1	3

PAPER NAME: PROGRAMMING FOR PROBLEM SOLVING
PAPER CODE: CS 201
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of the course students will be able to

CO1	Understand and differentiate among different programming languages for problem solving.
CO2	Describe the way of execution and debug programs in C language.
CO3	Define, select, and compare data types, loops, functions to solve mathematical and scientific problem.
CO4	Understand the dynamic behavior of memory by the use of pointers.
CO5	Design and develop modular programs using control structure, selection structure and file.

CO–PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	1
CO2	3	3	3	3	--	--	--	--	--	--	--	1
CO3	3	3	3	3	--	--	--	--	--	--	--	1
CO4	3	3	3	3	--	--	--	--	--	--	--	1
CO5	3	3	3	3	--	--	--	--	--	--	--	1

CO-PSO Mapping

Cos	PSO1	PSO2	PSO3
CS201.1	3	3	3
CS201.2	3	3	3
CS201.3	3	3	3
CS201.4	3	3	3
CS201.5	3	3	3

PAPER NAME: PHYSICS-I LAB
PAPER CODE: PH 291
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After attending the course students' will be able to

CO1	Demonstrate experiments allied to their theoretical concepts
CO2	Conduct experiments using LASER, Optical fiber, Torsional pendulum, Spectrometer
CO3	Participate as an individual, and as a member or leader in groups in laboratory sessions actively
CO4	Analyze experimental data from graphical representations, and to effectively communicate them in Laboratory reports including innovative experiments
CO5	Develop critical thinking skills to solve real life challenges

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

Course Outcomes	PSO1	PSO2	PSO3
CO1	2	3	2
CO2	2	3	3
CO3	3	3	3
CO4	2	3	3
CO5	3	3	3

PAPER NAME: WORKSHOP/MANUFACTURING PRACTICES
PAPER CODE: ME291
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Gain basic knowledge of Workshop Practice and Safety useful for our daily living
CO2	Identify Instruments of a pattern shop like Hand Saw, Jack Plain, Chisels etc and performing operations like such as Marking, Cutting etc used in manufacturing processes.
CO3	Gain knowledge of the various operations in the Fitting Shop using Hack Saw, various files, Scriber, etc to understand the concept of tolerances applicable in all kind of manufacturing
CO4	Get hands on practice of in Welding and various machining processes which give a lot of confidence to manufacture physical prototypes in project works.
CO5	Apply and performing operations like such as Marking, Cutting etc used in manufacturing processes

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

COs	PSO1	PSO2	PSO3
CO1	1	1	1
CO2	1	3	1
CO3	2	1	2
CO4	2	1	2
CO5	1	1	1

PAPER NAME: PROFESSIONAL COMMUNICATION LAB
PAPER CODE: HSMC291
CONTACT: 0:0:3
CREDIT: 1

Course Outcome:

After attending the course students' would be able to

CO1	Study the taxonomy of listening and speaking skills and sub-skills.
CO2	Apply the knowledge of the basics of note taking of factual data/ information in English and write technical reports.
CO3	Analyse communication behaviours
CO4	Identify, analyse in day-to-day communication the needs of specific vocabulary, language function and pronunciation in conversations, role plays and group discussions
CO5	Able to apply all sets of English language and communication skills in creative and effective ways in the professional sphere of their life

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

Cos	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

PAPER NAME: PROGRAMMING FOR PROBLEM SOLVING LAB
PAPER CODE: CS201
CONTACT: 0:0:3

CREDIT: 1.5

Course Outcome:

After completion of the course students will be able to

CO1	Apply the conception of data type, variable declaration to solve the problem.
CO2	Analyze the conception of data handling to solving problem and identify and correct syntax errors / logical errors as reported during compilation time and run time.
CO3	Create program using Arrays, Pointers, Structures, Union and Files. for solving different problem both recursive and non-recursive method
CO4	Understand the concept of arrays, pointers, file and dynamic memory allocation and apply it for problem solving and also create new data types using structure, union and enum.
CO5	Understand how to decompose a problem into functions and assemble into a complete program by means of modular programming possibly as a team.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	1
CO2	3	3	3	3	--	--	--	--	--	--	--	1
CO3	3	3	3	3	--	--	--	--	--	--	--	1
CO4	3	3	3	3	--	--	--	--	--	--	--	1
CO5	3	3	3	3	--	--	--	--	--	--	--	1

CO-PSO Mapping

Cos	PSO1	PSO2	PSO3
CO1	3	2	3
CO2	2	3	2
CO3	3	3	3
CO4	2	3	2
CO5	3	3	3

PAPER NAME: SEMICONDUCTOR PHYSICS

PAPER CODE: **PH(IT)301**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **38**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Describe various types quantum mechanical systems, action of storage and display devices, relate laws of static & time of varying electric, magnetic fields and illustrate the importance of nanomaterials in respect of modern quantum computing circuits.
CO2	Classify and compare fundamental particles based on statistical mechanics, switching from Schrodinger approach to Heisenberg approach while making transition from Classical to Quantum computation, interpret Maxwell's electromagnetic equations.
CO3	Apply quantum mechanics to explain various microscopic and nanoscopic phenomena and apply laws of static and dynamic electric and magnetic fields to develop electromagnetic theory.
CO4	Analyze operations of different types of quantum logic gates, examine nature of electron confinement in various nanostructures and their areas of application.
CO5	Access the need of a quantum computation as a remedy to overcome limitations imposed in Classical Computation, evaluate the importance of statistical mechanics in explaining actions of semiconductor devices.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	1	1	2
CO3	2	3	1
CO4	2	2	2
CO5	2	1	2

PAPER NAME: **NUMERICAL METHODS AND STATISTICS**
PAPER CODE: **IT302**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Recall the distinctive principles of numerical analysis and the associated error measures.
CO2	Apply numerical methods used to obtain approximate solutions to intractable mathematical problems such as interpolation, integration, the solution of linear and nonlinear equations, and the solution of ordinary differential equations.
CO3	Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.
CO4	Interpret complex statistical findings using the understanding of inferential statistics.
CO5	Interpret complex statistical findings using the understanding of inferentialstatistics.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	1	1	2
CO3	2	3	1
CO4	2	2	2
CO5	2	1	2

PAPER NAME: **ANALOG AND DIGITAL ELECTRONICS**
PAPER CODE: **IT303**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand basic analog and digital electronics, including semiconductor properties, operational amplifiers, combinational and sequential logic and analog-to- digital digital-to-analog conversion techniques
CO2	Identify different symbols, working principles of basic Digital electronics circuits for data processing application
CO3	Analyze the characteristics of basic digital circuits
CO4	Design analog amplifiers, combinational logic devices and sequential logic devices like counters and registers
CO5	Apply different types of wiring and instruments connections keeping in mind technical, Economical, safety issues

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	3	1	3
CO3	2	3	1
CO4	2	2	2
CO5	2	3	2

PAPER NAME:	DATA STRUCTURE AND ALGORITHM
PAPER CODE:	IT304
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDIT:	3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the concept of large amounts of data efficiently, such as large databases and indexing services.
CO2	Use some formal design methods and programming languages which emphasize on data structures, as the key organizing factor in software design
CO3	Analyze different kinds of data structures which are suited to different kinds of applications, and some are highly specialized to specific tasks
CO4	Create efficient data structures which are a key to designing efficient algorithms
CO5	Store and retrieve data stored in both main memory and in secondary memory

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME: FORMAL LANGUAGE AND AUTOMATA THEORY
COURSE CODE: IT305
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand situations in related areas of theory in computer science.
CO2	Model, compare and analyze different computational models using combinatorial methods and Identify limitations of some computational models and possible methods of proving them.
CO3	Analyze rigorously formal mathematical methods to prove properties of languages, grammars and Automata.
CO4	Construct algorithms for different problems and argue formally about correctness on different restricted Machine models of computation.
CO5	Identify limitations of some computational models and possible methods of proving Them

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	2	3
CO2	2	3	2
CO3	3	2	3
CO4	2	2	2
CO5	2	3	3
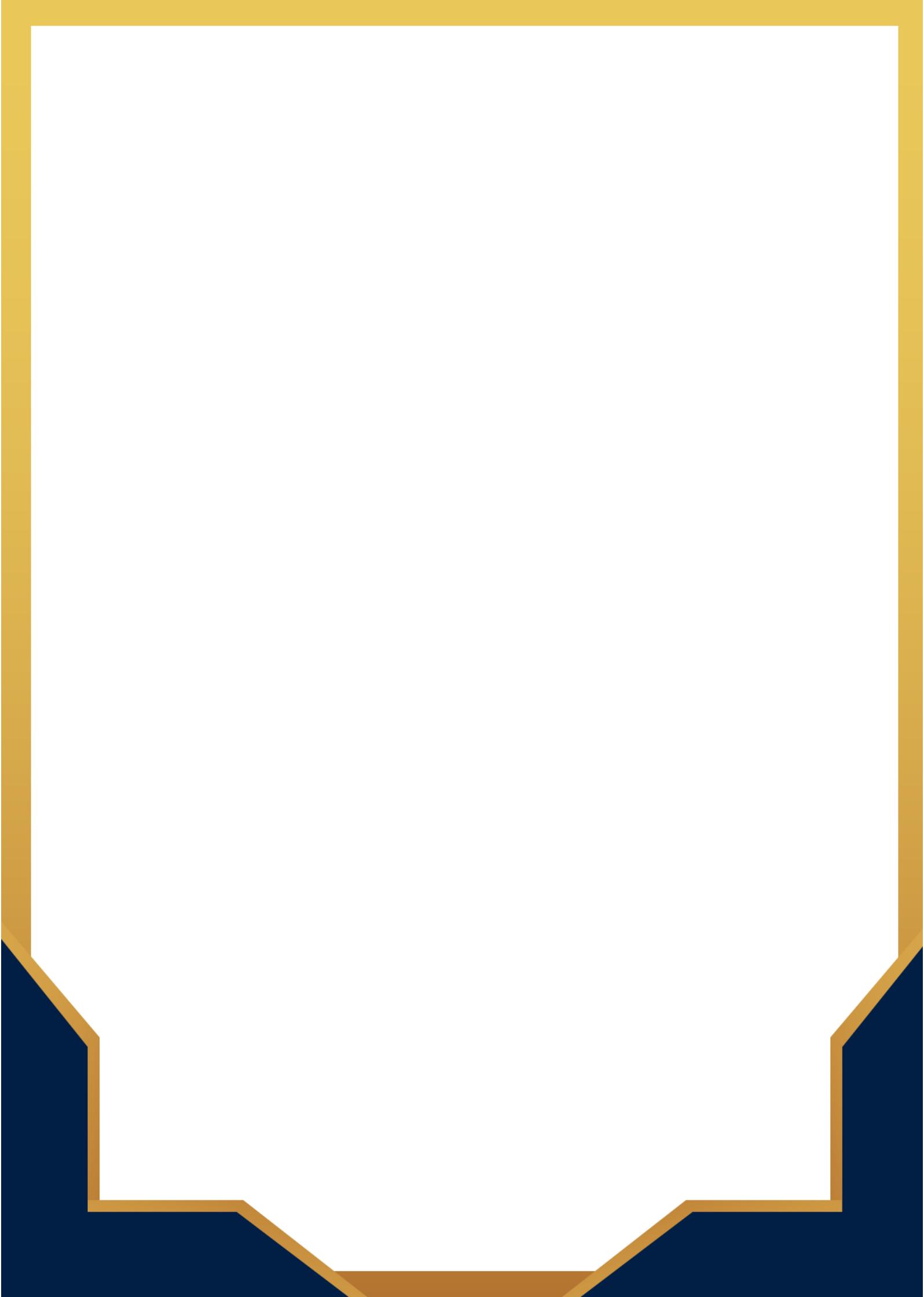
COURSE NAME:	**GENDER CULTURE AND DEVELOPMENT**
COURSE CODE:	**HSMC302**
CONTACT:	**2:0:0**
TOTAL CONTACT HOURS:	**24**
CREDIT:	**2**

Course Outcome:

After completion of this course students will be able to

CO1	Provide an analysis of the location of women in the processes of economic development; to understand what economic development is, the scales or levels at which it occurs, and the centrality of gender at every level.
CO2	Examine theoretical and conceptual frameworks for that analysis.
CO3	Reflect upon linkages between the global economy and the gendered macro and micro process of development and transitions from 'government' to 'governance.'
CO4	Explain the usefulness of a rights-based approach to gender justice.
CO5	Provide basis for research, practical action and policy formulation and or evaluating for evaluating directions and strategies for social change from a gender perspective.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	1	2	1
CO2	1	2	2
CO3	2	1	1
CO4	2	2	2
CO5	1	1	2

COURSE NAME: **NUMERICAL METHODS AND PROGRAMMING LAB**
COURSE CODE: **IT392**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:
After completion of this course students will be able to

CO1	Recall the distinctive principles of numerical analysis and the associated error measures.
CO2	Apply numerical methods used to obtain approximate solutions to intractable mathematical problems such as interpolation, integration, the solution of linear and nonlinear equations, and the solution of ordinary differential equations.
CO3	Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.
CO4	Interpret complex statistical findings using the understanding of inferential statistics.
CO5	Understand and measurement of Central Tendency Dispersion-variance, Standard deviation.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	3	3
CO2	3	2	2
CO3	2	3	3
CO4	3	2	2
CO5	2	1	2

COURSE NAME: ANALOG AND DIGITAL ELECTRONICS LAB
COURSE CODE: IT393
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Make use of analog electronic circuit devices such as BJTs and FETs, amplifiers.
CO2	Examine the characteristics of different basic logic gates and universal gates.
CO3	Construct different combinational and sequential circuits using basic logic gates.
CO4	Construct sequential circuits like registers and counters using flip-flops and basic gates
CO5	Realization of Synchronous and Asynchronous counter.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	3
CO2	3	2	2
CO3	2	3	2
CO4	2	2	2
CO5	3	3	3

COURSE NAME: DATA STRUCTURE AND ALGORITHM LAB
COURSE CODE: IT394
CONTACT: 0:0:3
CREDIT: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Apply the concept of dynamic memory management, data types, basic data structures, and complexity analysis.
CO2	Analyze the complexity of the different data structure and algorithm
CO3	Design and implement the appropriate linear and non-linear data structure and algorithm design method for a specified application design
CO4	Choose the appropriate linear and non-linear data structure and algorithm design method for a specified application design.
CO5	Analyze the complexity of the problems.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	3
CO2	3	2	2
CO3	2	3	2
CO4	2	2	2
CO5	3	3	3

COURSE NAME: **SEMICONDUCTOR PHYSICS LAB**
COURSE CODE: **PH(IT)391**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:
After completion of this course students will be able to

CO1	Demonstrate experiments allied to their theoretical concepts
CO2	Conduct experiments using semiconductors, dielectric and ferroelectrics
CO3	Classify various types of magnetic materials
CO4	Participate as an individual, and as a member or leader in groups in laboratory sessions actively
CO5	Analyze experimental data from graphical representations, and to effectively communicate them in Laboratory reports including innovative experiments

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	1	2	1
CO2	1	1	2
CO3	2	2	1
CO4	2	1	2
CO5	2	1	2

COURSE NAME:	MATHEMATICS
COURSE CODE:	M(IT)401
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDIT:	3

Course Outcome:

After completion of this course students will be able to

CO1	Recall the basic properties related to probability distribution, algebraic structures and graph theory.
CO2	Determine the solution the problems related to probability distribution, algebraic structure sand graph theory.
CO3	Apply the appropriate mathematical tools of probability distribution, algebraic structures and graph theory for the solutions of the problems in computational field.
CO4	Analyze the real world uncertain phenomena by identifying probability distribution and the real life problems using the algorithms of graph theory.
CO5	Construct the shortest path and minimal spanning tree from a given graph using the algorithms of graph theory

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	**2**	2

COURSE NAME:	COMPUTER ORGANIZATION AND ARCHITECTURE
COURSE CODE:	IT402
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	38
CREDIT:	3

Course Outcome:

After completion of this course students will be able to

CO1	Describe the structure and functioning of a digital computer, including its overall system architecture, operating system, and digital components.
CO2	Illustrate the organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.
CO3	Determine different hazards of the computer system and develop identical solutions
CO4	Analyze the performance of various components of Computer System and Compare the performance of different units of Computer Architecture
CO5	Judge the quality of something based on its adequacy, value, logic.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping	Program Specific Outcomes		
	PSO1	PSO2	PSO3
CO1	3	2	3
CO2	3	2	3
CO3	3	2	3
CO4	3	2	3
CO5	3	2	3

COURSE NAME: OPERATING SYSTEM
COURSE CODE: IT403
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of this course students will be able to

CO1	Demonstrate competence in recognizing and using operating system features.
CO2	Apply knowledge of different operating system algorithms.
CO3	Analyze theory and implementation of different operating system aspect and the structure and basic architectural components involved in operating system.
CO4	Evaluate different operating system approaches.
CO5	Apply knowledge of different operating system algorithms.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME:	SOFTWARE ENGINEERING
COURSE CODE:	IT404
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDIT:	3

Course Outcome:

After completion of this course students will be able to

CO1	Identify the need for engineering approach to software development and various processes of requirements analysis for software engineering problems.
CO2	Apply software engineering principles, techniques to develop and maintain, large scale software systems
CO3	Analyze and design of complex systems and meet ethical standards, legal responsibilities
CO4	Produce efficient, reliable, robust and cost-effective software solutions and perform independent research and analysis as an effective member or leader of software development team to achieve personal and team goals
CO5	Ability to work as an effective member or leader of software engineering teams and manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME:	OBJECT ORIENTED PROGRAMMING USING JAVA
COURSE CODE:	IT405
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDIT:	3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the key concepts of Object-oriented Programming
CO2	Apply basic to advanced features of Object-Oriented Programming for problem solving
CO3	Analyze various programming approaches with different feature of Object-Oriented Programming
CO4	Evaluate the application and use of different feature of Object-Oriented Programming
CO5	Design project by the acquired concepts form Object Oriented Programming

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	3
CO2	2	2	2
CO3	2	2	3
CO4	2	2	2
CO5	2	3	2

COURSE NAME: UNIVERSAL HUMAN VALUES
COURSE CODE: HSMC403
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of this course students will be able to

CO1	Develop holistic perspective based on self-exploration about themselves, family, society and nature/existence.
CO2	Cultivate the harmony in the human being, family, society and nature/existence.
CO3	Strengthen self-reflection.
CO4	Build commitment and courage to act.
CO5	Apply the method of synthesis of green chemistry and find green solution.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	1	1	2
CO3	1	1	1
CO4	2	2	2
CO5	1	3	1

COURSE NAME: **PYTHON PROGRAMMING LAB**
COURSE CODE: **IT491**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Apply different Programming Concept for application development
CO2	Analyze the application of different features of Python in application development
CO3	Evaluate the performance of different solutions using python to find an optimal solution
CO4	Develop different application using Python
CO5	Implement new features to develop innovative project using Python.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME: **COMPUTER ORGANIZATION AND ARCHITECTURE LAB**
     COURSE CODE: **IT492**
     CONTACT: **0:0:3**
CREDIT: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Apply the knowledge of mathematics, science, and engineering in simulation.
CO2	Use Hardware Description Language (HDL) in order to implement skills in designing Architectural solutions and describing designs using VHDL
CO3	Construct and examines digital circuit design using XLINX tool.
CO4:	Analyze & examine the digital circuit design using Simulation tool.
CO5:	Design and implement ALU and CPU with interfacing.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	2	3
CO2	3	3	2
CO3	2	3	3
CO4	2	2	2
CO5	2	3	3

COURSE NAME:	**OPERATING SYSTEM LAB**
COURSE CODE:	**IT493**
CONTACT:	**0:0:3**
CREDIT:	**1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Experiment with Unix commands and shell programming
CO2	Analyze the best CPU scheduling algorithm, memory management algorithm, synchronization techniques for a given problem instance
CO3	Develop algorithm for deadlock avoidance, detection and file allocation strategies
CO4	Describe and analyze the memory management and its allocation policies
CO5	Identify use and evaluate the storage management policies with respect to different storage management technologies.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME: **SOFTWARE ENGINEERING LAB**
COURSE CODE: **IT494**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Make use of efficient models for development of software for various projects.
CO2	Analyze a specification and examine the corresponding design for developing software.
CO3	Produce efficient, reliable, robust and cost-effective software solutions Designing valid test cases.
CO4	Ability to work as an effective member or leader of software engineering teams and manage time, processes and resources effectively by prioritizing competingdemands to achieve personal and team goals.
CO5	Able to track the progress of a project, also prepare SRS document, design document, test cases and software configuration management and risk management related document.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

Course Outcomes	Program Specific Outcomes			
	PSO1	PSO2	PSO3	
CO1	3	3	3	-
CO2	3	3	3	-
CO3	3	3	3	-
CO4	3	3	3	-
CO5	3	3	3	-

COURSE NAME: **OBJECT ORIENTED PROGRAMMING LAB**
COURSE CODE: **IT495**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Apply different Object-Oriented Programming Concept for application development
CO2	Analyze the application of different features of Java in application development
CO3	Evaluate the performance of different solutions using Java in search of an optimal solution
CO4	Develop different application using the concept of Java
CO5	Implement new features of Java for developing innovative projects

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	1
CO4	2	2	2
CO5	2	2	2

COURSE NAME: **ENVIRONMENTAL SCIENCE**
COURSE CODE: **MC401**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **22**
CREDIT: **3 UNITS**

Course Outcome:

After completion of this course students will be able to

CO1	Apply the knowledge of environmental science to 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.
CO2	Analyze and discuss the relevance of environmental science to 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.
CO3	Function in multi/inter-disciplinary teams with a spirit of tolerance, patience and understanding so necessary for team work
CO4	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.
CO5	Analyze and discuss the relevance of environmental science

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	**2**	2

COURSE NAME: **DATABASE MANAGEMENT SYSTEM**
COURSE CODE: **IT501**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **38**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand Database Management System, explain fundamental elements of a database management system, compare the basic concepts of relational data model, entity-relationship model, file organization and use appropriate index structure.
CO2	Apply efficient query optimization techniques, suitable transaction management, concurrency control mechanism and recovery management techniques.
CO3	Analyze the database design techniques and improve the design by normalization.
CO4	Design entity-relationship diagrams to represent simple database application scenarios, translate entity-relationship diagrams into relational tables, populate a relational database and formulate SQL queries on the data.
CO5	Explain File organization and use appropriate index structure

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: COMPUTER NETWORKING
COURSE CODE: IT502
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome:

After completion of this course students will be able to

CO1	Illustrate the network model and architecture
CO2	Apply different networking protocol for problem solving
CO3	Analyse different networking features for devising optimal solution
CO4	Evaluate routing algorithms for implementing solution for the real life problems
CO5	Design real network architecture

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **DESIGN AND ANALYSIS OF ALGORITHM**
   COURSE CODE: **IT503**
   CONTACT: **3:0:0**
   TOTAL CONTACT HOURS: **36**
   CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understanding the time complexity of the basic algorithms for the classic problems in various domains.
CO2	Apply the classic algorithms to solve different problems
CO3	Evaluate existing algorithms by calculating the time complexity
CO4	Design algorithm to solve various problems in different domains
CO5	Demonstrate a familiarity with major algorithms and data structures

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ECONOMICS FOR ENGINEERS**
COURSE CODE: **HSMC504**
CONTACT: **2:0:0**
TOTAL CONTACT HOURS: **24**
CREDIT: **2**

Course Outcome:

After completion of this course students will be able to

CO1	Identify various uses for scares resources
CO2	Understand key economic concepts
CO3	Apply critical thinking skills to analyze financial data and their impacts.
CO4	Evaluate business performance through cost accounting principles
CO5	And implement in real world problems

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: **MICROPROCESSOR AND MICROCONTROLLER**
COURSE CODE: **IT505A**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Correlate the architecture, instructions, timing diagrams, addressing modes, memory interfacing, interrupts, data communication of 8085
CO2	Apply instructions for assembly language programs of 8085, 8086 and 8051
CO3	Analyze Micro controller hardware, input/output pins, ports, external memory, counters and timers, instruction set, addressing modes, serial data i/o, interrupts
CO4	Apply instructions for assembly language programs of 8085, 8086 and 8051
CO5	Design peripheral interfacing model using IC 8255, 8253, 8251 with IC 8085, 8086 and 8051.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ARTIFICIAL INTELLIGENCE**
COURSE CODE: **IT505B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDIT: **3**

Course Outcome

After completion of this course students will be able to

CO1	Understand various AI search algorithms for instance uninformed, informed, heuristic, constraint satisfaction.
CO2	Apply facts, rules, and concepts of knowledge representation for instance logic-based, frame-based, semantic nets, inference and theorem proving.
CO3	Analyze working knowledge of reasoning in the presence of incomplete and/or uncertain information.
CO4	Evaluate and create knowledge representation, reasoning, and machine learning techniques for the solution of real-world problems.
CO5	Ability to apply knowledge representation, reasoning, and machine learning techniquesto real-world problems

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	2	2	3
CO3	3	3	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: **PROGRAMMING PRACTICE WITH C++**
COURSE CODE: **IT505C**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDIT: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand different programming paradigm and Object-Oriented programming concept.
CO2	Determining best possible feature of Object-Oriented Programming in solution providing.
CO3	Analyze different feature of Object-Oriented Programming in search of optimal solution.
CO4	Evaluate use and application of different Object-Oriented programming concept.
CO5	Design solution in application development.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	3	2
CO2	2	2	3
CO3	3	3	2
CO4	2	2	2
CO5	2	2	3

COURSE NAME: E-COMMERCE
COURSE CODE: IT505D
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDIT: 3

Course Outcome

After completion of this course students will be able to

CO1	Understand the policy issues related to privacy, intellectual property rights, and establishing identity those are germane to electronic commerce along with the Internet and related technologies.
CO2	Apply the underlying economic mechanisms and driving forces of E-Commerce.
CO3	Analyze the impact that electronic commerce is facing and outlines the different digital transaction process and basic concepts of e-commerce.
CO4	Evaluate the importance of digital library and specify the development of electronic commerce capabilities in a company.
CO5	Internet Banking, Virtual Auctions, Online Share Dealing, Gambling on the net, E-Diversity, Case studies through internet

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **DATABASE MANAGEMENT SYSTEM LAB**
COURSE CODE: **IT591**
CONTACT: **0:0:3**
CREDIT: 1.5

Course Outcome:
After completion of this course students will be able to

CO1	Applying SQL and PL/SQL for processing database
CO2	Analyze the database using queries to retrieve records
CO3	Develop solutions using database concepts for real time requirements.
CO4	Prepare reports
CO5	Application development using PL/SQL & front end tools

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **COMPUTER NETWORKING LAB**
COURSE CODE: **IT592**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Apply the concept of networking for implementing the solution.
CO2	Analyze different networking protocols for optimal solution.
CO3	Develop solutions for real time requirements.
CO4	Understand fundamental concepts in Routing, Addressing & working of Transport Protocols.
CO5	Understand Wireless LANs & Wireless Sensor Networks Operation.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **DESIGN ANALYSIS OF ALGORITHM LAB**
COURSE CODE: **IT593**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Apply different algorithmic approaches for solving the problems.
CO2	Analyze a problem and design the solution for the problem and analyse the efficiency of algorithms using time and space complexity theory.
CO3	Design and Optimize the solution with respect to time complexity & memory usage.
CO4	Able to Compare between different data structures and pick an appropriate data structure for a design situation.
CO5	Write rigorous correctness proofs for algorithms. Demonstrate a familiarity with major algorithms and data structures.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MICROPROCESSOR AND MICROCONTROLLER LAB**
COURSE CODE: **IT595A**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Able to solve small assignments using the 8085 basic instruction sets and memory mapping through trainer kit and simulator.
CO2	Able to write 8085 assembly language programs like Addition, Subtraction, Multiplication, Square, Complement, Look up table, Copying a block of memory, Shifting, Packing and unpacking of BCD numbers, Ascending order, Descending order etc. using trainer kit.
CO3	Able to validate the interfacing technique using 8255 trainer kit through subroutine calls and IN/OUT instructions like glowing LEDs accordingly, stepper motor rotation etc
CO4	Able to test fundamental of 8051 programs using the trainer kit.
CO5	To solve small assignments using the 8085 basic instruction sets and memory mapping through trainer kit and simulator

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ARTIFICIAL INTELLIGENCE LAB**
COURSE CODE: **IT595B**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Understand and recognize various AI search algorithms and AI tools.
CO2	Apply the fundamentals of knowledge representation, inference and theorem proving using AI tools.
CO3	Analyze working knowledge of reasoning in the presence of incomplete and/or uncertain information.
CO4	Evaluate and create knowledge representation, reasoning, and machine learning techniques for the solutions of real-world problems.
CO5	Identify and Apply Artificial Intelligence concepts to solve real world problems

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	3	2
CO2	2	2	3
CO3	2	3	2
CO4	3	2	2
CO5	2	2	2

COURSE NAME: **PROGRAMMING PRACTICE WITH C++ LAB**
COURSE CODE: **IT595C**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Apply the concept Object oriented programming concept using C++ in developing solution
CO2	Analyze different characteristics of Object-Oriented programming using C++ for choosing in developing solution
CO3	Evaluate the application of Inheritance and polymorphism in developing solution
CO4	Create application using different feature of C++
CO5	**CO5:** Demonstrate the use of various OOPs concepts and C++ features with the help of programs.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	3	2
CO2	2	2	3
CO3	2	3	2
CO4	3	2	2
CO5	2	2	2

COURSE NAME: **E-COMMERCE LAB**
COURSE CODE: **IT595D**
CONTACT: **0:0:3**
CREDIT: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Apply the concept for developing MVC application and describe and differentiate different Web Extensions and Web Services.
CO2	Analyzing different client and server side components for developing application and build dynamic web site using server side PHP programming and database connectivity
CO3	Implement the solution to real life problem using PHP concepts and Demonstrate web application using Python web Framework.
CO4	Apply and concept for developing MVC application and describe and differentiate different Web Extensions and Web Services
CO5	Apply and implement the solution to real life problem using PHP concepts and Demonstrate web application using Python web Framework

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: INTELLECTUAL PROPERTY RIGHT
COURSE CODE: MC501
CONTACT: 2:0:0
TOTAL CONTACT HOURS: 24
CREDIT: 3 UNITS

Course Outcome:
After completion of this course students will be able to

CO1	Explain fundamental aspects of Intellectual property Rights to students
CO2	Disseminate knowledge on patents, patent regime, copyright and trademarks in India and abroad and registration aspects,
CO3	Disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects.
CO4	Aware about current trends in IPR and Govt. steps in fostering IPR.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: **WEB TECHNOLOGY**
COURSE CODE: **IT601**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand web application architecture, technologies, and frameworks
CO2	Apply the concept of different front end and back-end components in problem solving
CO3	Analyze different architecture and web components
CO4	Evaluate different solutions in field of web application development
CO5	Design web application architecture to provide solution in web application development fields

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping		
Course Outcomes	**Program Specific Outcomes**		
	PSO1	**PSO2**	**PSO3**
CO1	2	3	2
CO2	2	3	2
CO3	2	3	2
CO4	2	3	2
CO5	2	3	2

COURSE NAME: **MACHINE LEARNING**
COURSE CODE: **IT602**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basics of machine learning techniques that make it useful to real-world problems.
CO2	Apply machine learning algorithms such as supervised, semi-supervised, and unsupervised.
CO3	Analyze various machine learning techniques to investigate real world applications.
CO4	Evaluate and create model for finding the solution of real world industry issues and problems.
CO5	Applymachineunsupervised.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: COMPUTER GRAPHICS
COURSE CODE: IT603A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic computer graphics and Identify different media representations of different multimedia data and data formats, windows, clipping and view-ports object representation.
CO2	Comprehend the concept of geometric, mathematical and algorithmic concepts necessary for programming computer graphics.
CO3	Differentiate windows, clipping and view-ports object representation in relation to images displayed on screen.
CO4	Distinguish different coding technique and software tools for solving real world problems related to graphics and multimedia.
CO5	Identify the software utilized in constructing computer graphics and multimedia applications.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: MULTIMEDIA TECHNOLOGY
COURSE CODE: **IT603B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Describe optical storage media along with different coding technique for solving real life multimedia application.
CO2	Apply the use of different media; representations of different multimedia data and data formats.
CO3	Analyze various compression techniques.
CO4	Evaluate and create various audio and video file formats.
CO5	Apply the use of different media

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: SOFT COMPUTING
COURSE CODE: IT603C
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome

After completion of this course students will be able to

CO1	Understand the basics of various soft computing techniques.
CO2	Apply different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
CO3	Analyze the applications of various soft computing techniques.
CO4	Evaluate and create soft computing techniques to solve engineering or real-life problems.
CO5	Design hybrid system to revise the principles of soft computing in various applications

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **DIGITAL IMAGE PROCESSING**
COURSE CODE: **IT603D**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the fundamental concepts of a digital image processing system
CO2	Identify images in the spatial as well as frequency domain using various transformation techniques for improving the image quality
CO3	Analyze various compression techniques.
CO4	Evaluate image segmentation and representation techniques.
CO5	Analyze and implement image segmentation and representation techniques

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: DATA WAREHOUSING AND DATA MINING
COURSE CODE: IT604A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 35
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic concepts of data warehousing and data mining.
CO2	Apply the various mining algorithms for extract knowledge from data warehouse.
CO3	Analyze different data warehousing methodologies and data mining algorithms
CO4	Design a data warehouse
CO5	Develop an understanding of the role played by knowledge in a diverse range of intelligent systems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3		3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: CRYPTOGRAPHY AND NETWORK SECURITY
COURSE CODE: IT604B
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Identify computer and network security threats, classify the threats, and understand different technique of cryptography and security.
CO2	Apply different algorithm and technique of encryption and decryption method over information and security techniques to the existing computer and network platforms.
CO3	Analyze existing cryptographic algorithm, authentication, and key agreement protocols; identify the strength and weaknesses of existing algorithm.
CO4	Design and develop cryptography algorithm and network technique security product or code, investigate the strong and weak points of the product or code.
CO5	Understand Firewall Configurations, DMZ Network and apply this technology

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	COMPILER DESIGN
COURSE CODE:	**IT604C**
CONTACT:	**3:0:0**
TOTAL CONTACT HOURS:	**36**
CREDITS:	**3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the knowledge of parsing, lexical and syntax analysis.
CO2	Apply the knowledge about the compilers they practically use.
CO3	Analyze various parsing techniques, code optimization.
CO4	Learn how the parse trees are generated, errors are handled and code is optimized
CO5	To learn how to implement intermediate code and target code generation.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **PATTERN RECOGNITION**
COURSE CODE: **IT604D**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **35**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand basic concepts in pattern recognition techniques, feature extraction techniques and representation of patterns in feature space.
CO2	Apply the various real world applications in pattern recognition techniques.
CO3	Analyze the application of machine vision, speech recognition and movement recognition used in pattern recognition research.
CO4	Evaluate and create model for Machine Vision, Speech Recognition, Speaker Identification, and Process Identification.
CO5	Demonstrate successful applications to process and analyze images, and to makeautomatic decisions based on extracted feature information

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **PRINCIPLES OF MANAGEMENT**
COURSE CODE: **HU605**
CONTACT: **2:0:0**
TOTAL CONTACT HOURS: **30**
CREDITS: **2**

Course Outcome:

After completion of this course students will be able to	
CO1	Recall and identify the relevance of management concepts.
CO2	Apply management techniques for meeting current and future management challenges faced by the organization.
CO3	Compare the management theories and models critically to solve real life problems in an organization.
CO4	Apply principles of management in order to execute the role as a manager in an organization.
CO5	Analyze the training issues for resource management in real life problem

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2		2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: COMPUTATIONAL GEOMETRY
COURSE CODE: IT606A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome

After completion of this course students will be able to

CO1	Exposure to algorithms and data structures for geometric problems.
CO2	Exposure to techniques for addressing degenerate cases.
CO3	Exposure to randomization as a tool for developing geometric algorithms
CO4	Apply the techniques to specific application domains of interest or pursue independent research in this area.
CO5	Apply the concept of the Environmentally Responsible Business Strategies

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MOBILE COMMUNICATION**
COURSE CODE: **IT606B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic of Mobile Communication system & its generation in wireless network
CO2	Analyze the network infrastructure requirements to support mobile devices and users.
CO3	Apply the knowledge to determine the functionalities, techniques, protocols and architecture employed in wireless local area networks, cellular networks, and performs basic requirements analysis.
CO4	Evaluate the techniques and technologies to design and communicate a simple mobile application for smaller devices.
CO5	Apply techniques and technologies to design and communicate a simple mobile application for smaller devices

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3		3	3	3	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: ROBOTICS
COURSE CODE: IT606C
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 35
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the computational methods necessary to model and solve kinematic problems involving robot manipulators and mobile robots.
CO2	Experiment with the most common robot sensors and understand fundamental sensor processing algorithms and their engineering trade-offs.
CO3	Analyze the computational challenges inherent in fundamental mobile robotic tasks.
CO4	Develop simple robot control systems integrating perception, planning, and action.
CO5	Understand fundamental sensor

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **WIRELESS SENSOR NETWORKS**
COURSE CODE: **IT606D**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Understand and explain common wireless sensor node architectures.
CO2	Apply the various ad hoc routing protocols and transport layer mechanisms.
CO3	Analyse the issues of routing in wsn and QoS related performance measurements.
CO4	Design a wireless sensor network for given sensor data using microcontroller, transceiver, middleware and operating system.
CO5	Design a wireless sensor network

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	WEB TECHNOLOGY LAB
COURSE CODE:	IT 691
CONTACT:	0:0:3
CREDITS:	1.5

Course Outcome

After completion of this course students will be able to

CO1	Apply the concept of web technology in designing solution
CO2	Analyze different features of web technology for best suitable solution providing
CO3	Evaluate different web application solution applying the concept of different front end and back end technologies
CO4	Create web application solution for different problems
CO5	Develop real life project through applying updated web technology platform.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping			
Course Outcomes	Program Specific Outcomes		
	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	3	3
CO5	2	2	3

COURSE NAME: MACHINE LEARNING LAB
COURSE CODE: IT692
CONTACT: 0:0:3
CREDITS: 1.5

Course Outcome

After completion of this course students will be able to

CO1	Apply machine learning algorithms such as supervised, semi-supervised, and unsupervised.
CO2	Analyze various machine learning techniques to investigate real world applications.
CO3	Evaluate and create model for finding the solution of real world industry issues and problems.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: COMPUTER GRAPHICS LAB
COURSE CODE: **IT693A**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome:
    After completion of this course students will be able to

CO1	Apply 3D graphical scenes using open graphics library suits.
CO2	Analyze the effects of scale and use on both presentation and lower-level requirements.
CO3	Compare interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications surrounding the emergence of multimedia technology.
CO4	Implement image manipulation, enhancement, and basic transformations on objects and clipping algorithm on lines.
CO5	Develop an interactive multimedia presentation by using multimedia devices

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	MULTIMEDIA TECHNOLOGY LAB
COURSE CODE:	IT693B
CONTACT:	0:0:3
CREDITS:	1.5

Course Outcome:

After completion of this course students will be able to

CO1	Understand about various latest interactive multimedia devices, the basic concepts about images and image format.
CO2	Apply and analyze data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
CO3	Evaluate and develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications are surrounding the emergence of multimedia technology.
CO4	Analyze the effects of scale and use on both presentation and lower level requirements along with feedback evaluation in response to an objective set of criteria for multimedia design.
CO5	Implement image manipulation, enhancement, and basic transformations on objects and clipping algorithm on lines

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	SOFT COMPUTING LAB
COURSE CODE:	IT693C
CONTACT:	0:0:3
CREDITS:	1.5

Course Outcome:

After completion of this course students will be able to

CO1	Apply different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
CO2	Analyze and implement real life problems based on soft computing techniques.
CO3	Evaluate and create soft computing model to solve real life problems of the society.
CO4	Design the methodology to solve optimization problems using fuzzy logic, genetic algorithms and neural networks.
CO5	Design hybrid system to revise the principles of soft computing in various applications

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **DIGITAL IMAGE PROCESSING LAB**
COURSE CODE: **IT693D**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Apply enhancing operations on the image using spatial filters and frequency domain filters.
CO2	Analyse the characteristics of the image using different transformation techniques.
CO3	Estimate the efficiency of the compression techniques on the images.
CO4	Plan different segmentation operations of images.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **CONSTITUTION OF INDIA**
COURSE CODE: **MC 601**
CONTACT: **2:0:0**
TOTAL CONTACT HOURS: **24**
CREDITS: **2 UNITS**

Course Outcome

After completion of this course students will be able to

CO1	Identify and explore the basic features and modalities of Indian constitution**.**
CO2	Differentiate and relate the functioning of Indian parliamentary system at the centre and state level.
CO3	Differentiate the various aspects of Indian Legal System and its related bodies.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping		
Course Outcomes	**Program Specific Outcomes**		
	PSO1	**PSO2**	**PSO3**
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: CLOUD COMPUTING
COURSE CODE: IT701A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Prerequisite:
Networking, Operating System, Web Technology.

Course Objective:
The objective of the course is to learn and understand Cloud computing in details and identify the usage of it.

Course Outcome
After completion of this course students will be able to

CO1	Understand the basic architecture of cloud computing
CO2	Apply the knowledge of cloud computing in the evaluation of the computing model.
CO3	Analyze different features of Cloud Computing
CO4	Evaluate the different models and solutions provided in the field of cloud computing.
CO5	Design different solution with different services in cloud computing

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping		
Course Outcomes	**Program Specific Outcomes**	
	PSO1	**PSO2**	**PSO3**
CO1	2	2	2
CO2	2	2	2
CO3	3	3	2
CO4	2	3	3
CO5	3	3	2

COURSE NAME: INTERNET TECHNOLOGY
    COURSE CODE: **IT701B**
    CONTACT: **3:0:0**
    TOTAL CONTACT HOURS: **36**
    CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1:	Understand advanced networking concepts and internet and web application architectures
CO2:	Apply and Analyze d different advanced routing protocols being used in web application development
CO3:	Evaluate and analyze different solution available in the field of networking and web application development such as http and the World Wide Web, HTML, and Java Scripts;
CO4:	Implement solution for different critical network related issues as; implementing the design using the client/server model, testing, and documenting the solutions developed.
CO5	Analyze and evaluate different solution available in the field of networking and webapplication development such as http and the World Wide Web, HTML, and Java Scripts;

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping			
Course Outcomes	**Program Specific Outcomes**		
	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	BIG DATA ANALYTICS
COURSE CODE:	IT701C
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDITS:	3

Course Outcome:

After completion of this course students will be able to

CO1	Understand basic concepts and requirements of big data analytics
CO2	Apply the concept of big data analytics to handle huge dataset
CO3	Analyze big data with different available algorithm and theorem
CO4	Design and develop different analytical solution organizing huge dataset
CO5	Analyze the Simulation output

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	DISTRIBUTED SYSTEM
COURSE CODE:	IT701D
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	35
CREDITS:	3

Course Outcome

After completion of this course students will be able to

CO1	Understand the knowledge of the basic elements and concepts related to distributed system technologies for identify core architectural aspects of distributed systems
CO2	Use important methods in distributed systems to support scalability and fault tolerance
CO3	Analyse the utility of main underlying components of distributed systems
CO4	Build a distributed system by using the required components
CO5	Demonstrate experience in building large-scale distributed applications

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: INTERNET OF THINGS
COURSE CODE: IT702A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic concepts of IoT and it's architectures.
CO2	Apply the concepts of IoT to design different smart tools.
CO3	Analyze different issues in the domain of IoT and understand the practical applications of IoT.
CO4	Evaluate and analyze different solution for the real life problems of IoT.
CO5	Under stand different layer architecture to implement in project.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ADVANCED DATABASE MANAGEMENT SYSTEM**

COURSE CODE: **IT702B**

CONTACT: **3:0:0**

TOTAL CONTACT HOURS: **36**

CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Evaluate and Apply Advanced Database Development Techniques.
CO2	Evaluate different Database Systems
CO3	Perform administrator's job for database systems.
CO4	Design & Implement Advanced Database Systems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	**BLOCK CHAIN TECHNOLOGY**
COURSE CODE:	**IT702C**
CONTACT:	**3:0:0**
TOTAL CONTACT HOURS:	**36**
CREDITS:	**3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic concepts of blockchain and it's architectures.
CO2	Analyze different issues in the domain of blockchain and understand the practical applications of blockchain.
CO3	Evaluate and analyze different solutions for the real life problems related to the blockchain.
CO4	Design different solution applying and analyzing concept of Block chain
CO5	Understand the blockchain system

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: DEEP LEARNING
   COURSE CODE: **IT702D**
   CONTACT: **3:0:0**
   TOTAL CONTACT HOURS: **36**
   CREDITS: **3**

Course Outcome:
   After completion of this course students will be able to

CO1	Understand the basics of Machine Learning & Deep Learning techniques that make it useful to real-world problems.
CO2	Apply Deep learning algorithms such as supervised, semi-supervised, and unsupervised.
CO3	Analyze various Deep learning techniques to investigate real world applications.
CO4	Evaluate and create model for finding the solution of real world industry issues and problems.
CO5	Apply Deep learning algorithms

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MOBILE APPLICATION DEVELOPMENT**
COURSE CODE: **IT703A**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand different mobile applications.
CO2	Interpret the architecture of hardware and software of mobile application.
CO3	Combine GPS and social media networking applications.
CO4	Improve different exiting applications.
CO5	Solve problems calendar and address book problems with social media application – Using Wifi - iPhone marketplace.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	**FUZZY LOGIC AND APPLICATION**
COURSE CODE:	**IT703B**
CONTACT:	**3:0:0**
TOTAL CONTACT HOURS:	**36**
CREDITS:	**3**

Course Outcome

After completion of this course students will be able to

CO1:	Examine the Set Theory problems.
CO2:	Interpret the systems which include fuzziness within the scope of fuzzy set theory.
CO3:	Combine the information of decision theory and the information of fuzzy set theory.
CO4:	Improve the proof techniques of Fuzzy Set Theory.
CO5:	Solve problems that include uncertainty with using Fuzzy Set Theory.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MICROCONTROLLER AND VLSI DESIGN**
COURSE CODE: **IT703C**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **35**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Understand of the characteristics of CMOS circuit construction and the comparison between different state-of-the-art CMOS technologies and processes
CO2	Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnect
CO3	Categorize different VLSI Fabrication Process
CO4	Complete a significant VLSI design project having a set of objective criteria and design constraints
CO5	Apply CMOS technology-specific layout rules in the placement and routing oftransistors and interconnect, and to verify the functionality, timing, power, and parasitic effects

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: OPERATIONAL RESEARCH ANDOPTIMIZATION TECHNIQUE
COURSE CODE: IT703D
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome

After completion of this course students will be able to

CO1	Understand knowledge-base representation models.
CO2	Apply different rule-based expert systems and planning tools.
CO3	Analyze the performance of rule-based-systems.
CO4	Develop heuristic search algorithms for real life problem solving.
CO5	Analyze the performance

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: ADVANCED COMPUTER ARCHITECTURE
COURSE CODE: **IT704A**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the cost, performance, Trends in Technology, data flow in arithmetic algorithms and Principles of computer design.
CO2	Model the architectural features of advanced processors.
CO3	Analyze the working of pipelining, exploring instruction level parallelism using static, dynamic & advanced techniques of scheduling
CO4	Explain memory organization.
CO5	Explain mapping techniques

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MODELING AND SIMULATION**
COURSE CODE: **IT704B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Investigate and summarize various issues in modeling and simulation.
CO2	Apply the knowledge of system dynamics and probability theories in simulation.
CO3	Demonstrate the ability to simulate a generic system like Queuing Systems
CO4	Evaluate and analyze various results obtained from the simulation process
CO5	Identify the application potentials of modeling and simulation and apply the same knowledge to solve complex problems in various engineering disciplines.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **VIRTUAL AND AUGMENTED REALITY**
COURSE CODE: **IT704C**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basic concept of Virtual Reality
CO2	Apply the knowledge of virtual reality in the evaluation of different models.
CO3	Analyze different problems in the domain of Virtual Reality
CO4	Evaluate the different solutions provided in the field of virtual reality
CO5	Understand the core values that shape the ethical behaviour of an engineer and Exposed awareness on professional ethics and human values.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ENTREPRENEURSHIP DEVELOPMENT**
COURSE CODE: **IT704D**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **34**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Understand the meaning Entrepreneurship
CO2	Apply the knowledge in the evaluation of different models.
CO3	Analyze different problems in the domain entrepreneurship skill development
CO4	Evaluate the different solutions, rules and regulation provided in the field of developing enterprises
CO5	importance of term Entrepreneurship

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **CLOUD COMPUTING LAB**
COURSE CODE: **IT791A**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Apply the concept cloud computing to solve practical use cases
CO2	Analyzing different services in cloud computing
CO3	Evaluate different available services provided by cloud vendors
CO4	Design Cloud based application
CO5	Understand the different case study on open source and commercial clouds platform

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **INTERNET TECHNOLOGY LAB**
COURSE CODE: **IT791B**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Understanding and apply the basic networking concepts for configuration of network server and routing protocols
CO2	Analyzing and understanding the concept of .NET framework
CO3	Apply the concept of .NET for implementing web applications
CO4	Evaluate different web application to implement optimal solutions for real life problems.
CO5	Implement updated internet technology in optimal solutions of real life problems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **BIGDATA ANALYTICS LAB**
COURSE CODE: **IT791C**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Understand and implement the basics of data structures like linked list, stack, queue, set and map in Java.
CO2	Demonstrate the knowledge of Big Data Analytics and implement different file management task in Hadoop.
CO3	Understand Map Reduce Paradigm and develop data applications using variety of Systems.
CO4	Analyze and perform different operations on data using Pig Latin Scripts.
CO5	Illustrate and apply different operations on relations and databases using Hive.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: DISTRIBUTED SYSTEM LAB
COURSE CODE: IT791D
CONTACT: 0:0:3
CREDITS: 1.5

Course Outcome:

After completion of this course students will be able to

CO1	Use the knowledge of the basic elements and concepts related to distributed system technologies for identify core architectural aspects of distributed systems;
CO2	Analyse the functions of main underlying components of distributed systems (such as RPC, file systems)
CO3	Built a distributed systems to support scalability and fault tolerance;
CO4	To learn how the parse trees are generated, errors are handled and code is optimized.
CO5	To learn how to implement intermediate code and target code generation.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **MOBILE APPLICATION DEVELOPMENT LAB**

COURSE CODE: **IT793A**

CONTACT: **0:0:3**

CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Understand different mobile applications.
CO2	Interpret the architecture of hardware and software of mobile application.
CO3	Combine GPS and social media networking applications.
CO4	Improve different exiting applications.
CO5	Solve problems calendar and address book problems with social media application – Using Wifi - iPhone marketplace.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **FUZZY LOGIC LAB**
COURSE CODE: **IT793B**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Demonstrate basic concepts fuzzy logic and neural network through simulation.
CO2	Develop the logic given in problem statement using algorithms in NN and basic of toolbox studied.
CO3	Develop the logic given in problem statement using operations in fuzzy logic and basics of toolbox studied.
CO4	Develop real life applications using NN and Fuzzy Logic.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **VLSI DESIGN LAB**
COURSE CODE: **IT793C**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome

After completion of this course students will be able to

CO1	Measure VIL, VIH, VOL, VOH, noise margin, CMOS inverter gate delay and average power consumption of CMOS inverter.
CO2	Design combinational circuit - CMOS AND/NAND, OR/NOR, XOR/XNOR gate, CMOS full adder circuit, sequential circuit -CMOS SR latch, clocked SR latch & D flip-flop at schematic level for functional verification with the help of SPICE tools.
CO3	Construct layout of CMOS inverter, CMOS NAND, CMOS NOR gate using layout design tools of SPICE based on design rules.
CO4	Design of combinational circuits - logic gates, Full adder using half adder, 4:1 MUX using 2:1MUX, Sequential circuits-S-R Flip-Flop, 8-bit synchronous counter, 8 Bit bi-directional register with tri-stated input output using VHDL and 4:1 MUX using FPGA.
CO5	Design of CMOS differential amplifier with active load and biased with current mirror for given specification using SPICE tools at schematic level.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **OPERATIONAL RESEARCH LAB**
COURSE CODE: **IT793D**
CONTACT: **0:0:3**
CREDITS: **1.5**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the workings procedures of various OR techniques.
CO2	Execute basic command and scripts in a mathematical way using C
CO3	Apply the programming skills to solve the problems.
CO4	Analyze basic optimization techniques.
CO5	Understand various OR techniques

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ENTREPRENEURSHIP & INNOVATION SKILL**
COURSE CODE: **MC701**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **24**
CREDITS: **3 UNITS**

Course Outcome
After completion of this course students will be able to

CO1	Comprehend the role of bounded rationality, framing, causation and effectuation in entrepreneurial decision making.
CO2	Demonstrate an ability to design a business model canvas.
CO3	Evaluate the various sources of raising finance for startup ventures.
CO4	Explain the fundamentals of developing and presenting business pitching to potential investors.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping			
Course Outcomes	Program Specific Outcomes		
	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

COURSE NAME: DATA SCIENCE
COURSE CODE: IT801A
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 35
CREDITS: 3

Course Outcome

After completion of this course students will be able to

CO1	Demonstrate proficiencies with statistical and probabilistic data analysis.
CO2	Evaluate different statistical analysis mechanisms
CO3	Apply the statistical knowledge to build and assess different data-driven models.
CO4	Demonstrate skill in data engineering like storage, extraction, transformation, loading, pre-processing, feature identification, and data mining.
CO5	Various datasets utilizing modern software tools.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **BUSINESS ANALYTICS**
COURSE CODE: **IT801B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Find a meaningful pattern in data
CO2	Graphically interpret data
CO3	Implement the analytic techniques
CO4	Handle large scale analytics projects from various domains
CO5	Implement updated business analytics for solving various problems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **CLUSTER AND GRID COMPUTING**
COURSE CODE: **IT801C**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1:	Understand the basic architecture of Cluster and Grid Computing
CO2:	Apply the knowledge of Cluster and Cluster computing in the evaluation of the computing model
CO3:	Analyze different problems in the domain of Cluster and Grid computing
CO4:	Evaluate the different models and solutions provided in the field of Cluster and Grid computing
CO5	Cluster computing in the evaluation of the computer

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
CO5	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	**INFORMATION THEORY & CODING**
COURSE CODE:	**IT801D**
CONTACT:	**3:0:0**
TOTAL CONTACT HOURS:	**36**
CREDITS:	**3**

Course Outcome

After completion of this course students will be able to

CO1	Understand basics of communication system and coding schemes.
CO2	Apply the basic concept of PCM systems
CO3	Analyze and evaluate band pass signaling schemes.
CO4	Create spectral characteristics of band pass signaling schemes and asses noise performance.
CO5	Basic concepts of baseband transmission schemes

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **ENTERPRISE RESOURCE PLANNING**
COURSE CODE: **IT802A**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome

After completion of this course students will be able to

CO1	Understand the basic concepts and benefits of ERP for identifying different technologies and IT support used in ERP.
CO2	Apply the concepts of ERP Manufacturing Perspective and ERP Modules.
CO3	Analyze different tools used in ERP
CO4	Evaluate the ERP life cycle for different business scenario.
CO5	Solve the Simulation of Queuing Systems

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **NATURAL LANGUAGE PROCESSING**
COURSE CODE: **IT802B**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **36**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the basics of text processing including basic pre-processing, spelling correction, language modeling, Part-of-Speech tagging, Constituency and Dependency Parsing, Lexical Semantics, distributional Semantics and topic models
CO2	Apply the text mining such as entity linking, relation extraction, text summarization, text classification, sentiment analysis and opinion mining.
CO3	Analyze the application of text mining such as entity linking, relation extraction, text summarization, text classification, sentiment analysis and opinion mining
CO4	Evaluate and create various texts mining model to solve real world tasks using NLP tool kits
CO5	Familiar with research field and able to implement a system which processes a natural Language

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **BIO-INFORMATICS**
COURSE CODE: **IT802C**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **35**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Acquire the knowledge of Bioinformatics technologies with the related concept of DNA, RNA and their implications
CO2	Understand the concept and techniques of different types of Data Organization and Sequence Databases with different types of Analysis Tools for Sequence Data Banks
CO3	Acquire the knowledge of the DNA Sequence Analysis
CO4	Analyze the performance of different types of Probabilistic models used in Computational Biology
CO5	Understand Sequence Databases with different types of Analysis Tools for Sequence Data Bank

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **EMBEDDED SYSTEM**
COURSE CODE: **IT802D**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **35**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the architecture and classifications of different embedded systems and the related programming knowledge.
CO2	Apply the key concepts of embedded systems like I/O, timers, interrupts, interaction with peripheral devices.
CO3	Analyze the case-specific debugging technique for an embedded system.
CO4	Design Embedded system for specific scenario.
CO5	Apply the key concepts of embedded

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: **CYBER LAW AND SECURITY POLICY**
COURSE CODE: **IT803A**
CONTACT: **3:0:0**
TOTAL CONTACT HOURS: **35**
CREDITS: **3**

Course Outcome:

After completion of this course students will be able to

CO1	Understand the policy issues related to electronic filing of documents.
CO2	Identify the importance of lawful recognition for transactions through electronic data interchange and other means of electronic communication.
CO3	Analyze the effectiveness of the prevailing information security law practices.
CO4	Judge the architecture that can cater to the needs of the social information security.
CO5	Comprehend the architecture that can cater to the needs of the social information security.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	**HUMAN COMPUTER INTERACTION**
COURSE CODE:	**IT803B**
CONTACT:	**3:0:0**
TOTAL CONTACT HOURS:	**34**
CREDITS:	**3**

Course Outcome

After completion of this course students will be able to

CO1:	Understand the design and development processes and life cycle of Human Computer Interaction
CO2:	Apply the interface design standards/guidelines for cross cultural and disabled users.
CO3:	Analyze product usability evaluations and testing methods.
CO4:	Design and Develop Human Computer Interaction in proper architectural structures.
CO5	life cycle of Human Computer Interaction

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME:	HUMAN RESOURCE MANAGEMENT
COURSE CODE:	IT803C
CONTACT:	3:0:0
TOTAL CONTACT HOURS:	36
CREDITS:	3

Course Outcome

After completion of this course students will be able to

CO1	Explain the importance of human resources and their effective management in organizations and the meanings of terminology used.
CO2	Apply the tools used in managing employees Effectively and Record governmental regulations affecting employees and employers.
CO3	Analyze the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training.
CO4	Evaluate the different tools used in planning and maintenance of human resource needs.
CO5	Analyze the training issues for resource management in real life problem.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: CONTROL SYSTEM
COURSE CODE: IT803D
CONTACT: 3:0:0
TOTAL CONTACT HOURS: 36
CREDITS: 3

Course Outcome

After completion of this course students will be able to

CO1	Recall and introduce stability analysis and design of compensators.
CO2	Understand the use of transfer function models for analysis physical systems and introduce the control system components.
CO3	Apply and provide adequate knowledge in the time response of systems and steady state error analysis.
CO4	Analyzing the principles of state variable representation of physical systems.
CO5	Design the open loop and closed–loop frequency responses of systems according the basic knowledge.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	--	--	--	--	--	--	--	--
CO2	3	3	3	3	--	--	--	--	--	--	--	--
CO3	3	3	3	3	--	--	--	--	--	--	--	--
CO4	3	3	3	3	--	--	--	--	--	--	--	--
CO5	3	3	3	3	--	--	--	--	--	--	--	--

CO-PSO Mapping

	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE NAME: ESSENCE OF INDIAN KNOWLEDGE TRADITION
COURSE CODE: MC881
CONTACT: 3:0:0
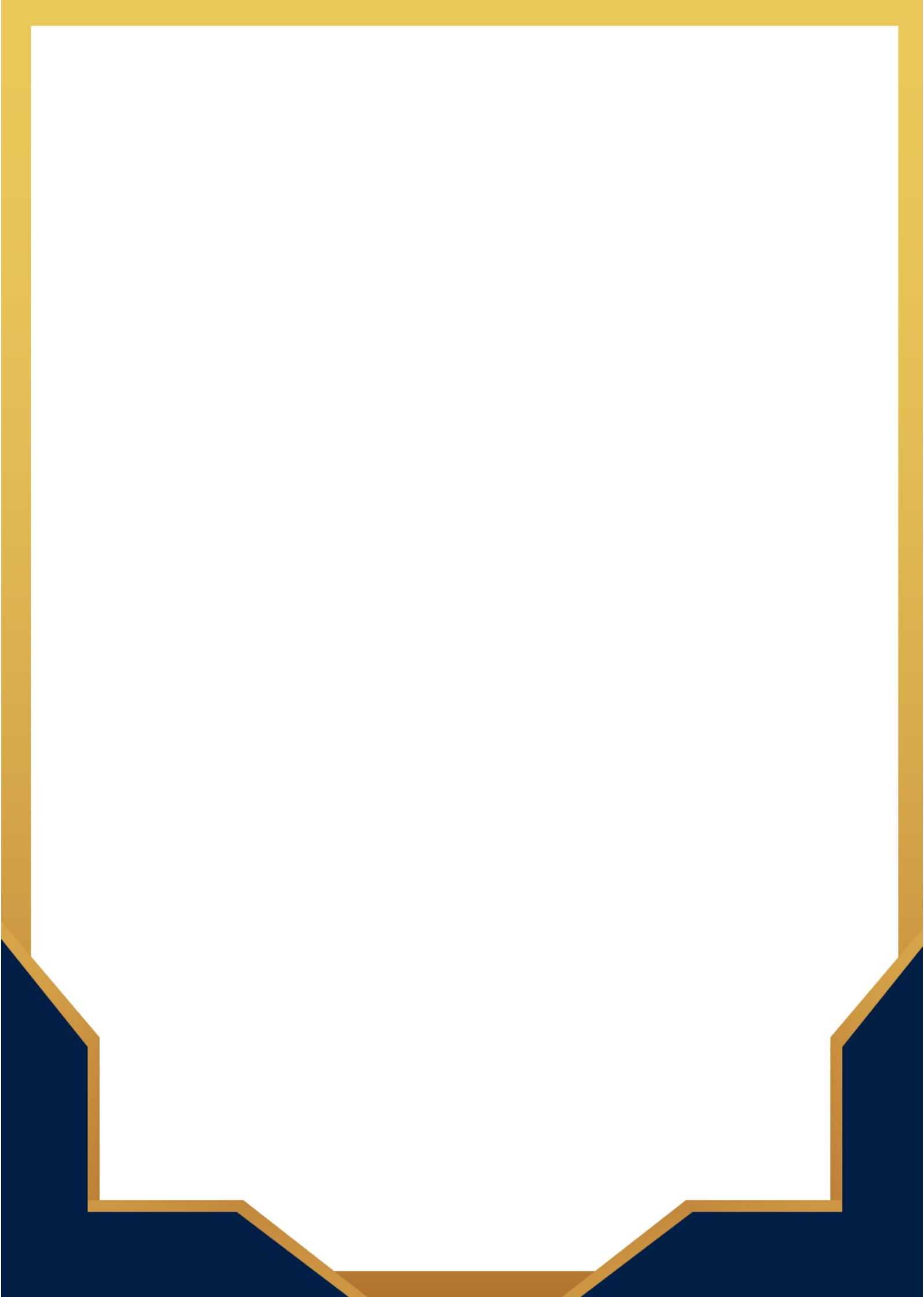**TOTAL CONTACT HOURS:** 36
CREDITS: 3 UNITS

Course Outcome:

After completion of this course students will be able to

CO1	Understand the concept of Traditional knowledge and its importance.
CO2	Use the connection between Modern Science and Indian Knowledge System.
CO3	Analyze the importance of Yoga for health care.
CO4	Evaluate the effect of traditional knowledge on environment.
CO5	Analyze the training issues for resource management in real life problem.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	--	--	--	--	--	--	--	--
CO2	2	2	2	2	--	--	--	--	--	--	--	--
CO3	2	2	2	2	--	--	--	--	--	--	--	--
CO4	2	2	2	2	--	--	--	--	--	--	--	--
C05	2	2	2	2	--	--	--	--	--	--	--	--

CO-PSO Mapping		
Course Outcomes	**Program Specific Outcomes**		
	PSO1	**PSO2**	**PSO3**
CO1	2	2	2
CO2	2	2	2
CO3	2	2	2
CO4	2	2	2
CO5	2	2	2

NARULA INSTITUTE OF TECHNOLOGY

UGC | NAAC | NBA | NATIONAL INSTITUTIONAL RANKING FRAMEWORK | ATAL AICTE TRAINING & LEARNING ACADEMY | MAKAUT (Formerly, WBUT) | AICTE | WBSCT&VE&SD (Formerly WBSCTE)

81, Nilgunj Rd, Agarpara, Kolkata, West Bengal 700109
www.nit.ac.in | 033 2563 8888