NIRMA UNIVERSITY

Institute of Technology

M Tech Computer Science and Engineering (CSE)

Semester – I

L	T	P	C
3	0	2	4

Course Code	3CS1109
Course Title	Complexity Theory and Algorithms

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to -
1. comprehend time & space complexity and formal aspects of algorithms
2. identify appropriate data structures and methodologies for efficient algorithm design
3. design and implement efficient algorithms using various approaches

L	T	P	C
3	0	2	4

Course Code	3CS1110
Course Name	High Performance Computing Architecture

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to –

1. comprehend various High Performance Computing (HPC) system architectures
2. identify design issues related to the architectural characteristics and performance of HPC systems
3. design and implement compute intensive applications on HPC platform

L	T	P	C
3	0	2	4

Course Code	3CS1111
Course Name	Applied Machine Learning

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to –

1. comprehend statistical methods as basis of machine learning domain
2. apply and evaluate variety of machine learning algorithms
3. implement machine learning techniques to solve problems in interdisciplinary domains

L	T	P	C
3	0	2	4

Course Code	3CS1112
Course Name	Advanced Database Systems

Course Learning Outcomes (CLO):

At the end of the course, students will be able to –

1. assess various storage and retrieval methods through appropriate indexing
2. design and analyze efficiency of algorithms for database operations
3. comprehend contemporary database architectures and its relevant issues

L	T	P	C
3	0	0	3

Course Code	3CS1113
Course Name	Applied Mathematics for Computer Science

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to –

1. comprehend the mathematical fundamentals related to sets, probability, statistics, linear algebra and mathematical optimization
2. apply the mathematical principles to solve wide range of problems in computer science
3. use the mathematical concepts as per the need of the application

L	T	P	C
1	0	0	0

Course Code	3SP1103
Course Title	Ethics for Data Science

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to -
1. describe the principles of fairness, accountability and transparency in data science
2. realize the ethical considerations regarding research, privacy and control of information and big data
3. comprehend the contemporary practices in data handling

Semester-II

L	T	P	C
2	0	2	3

Course Code	3CS1206
Course Title	Advanced Computer Networks

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to -

1. demonstrate the knowledge of modern networking concepts and data center network planning
2. apply suitable methods to optimize performance of modern networks
3. design and configure networks to support a specified set of applications

L	T	P	C
2	-	-	2

Course Code	3SS1201
Course Title	Research Methodology and IPR

Course Outcomes (COs):

At the end of the course, students will be able to -

1. formulate a research problem for a given engineering domain.

2. analyse the available literature for given research problem.

3. develop technical writing and presentation skills.

4. comprehend concepts related to patents, trademark and copyright.

L	T	P	C
-	-	10	5

Course Code	3CS1207
Course Title	Minor Project

Course Outcomes (COs):

At the end of the course, students will be able to -

1. identify the issues related with the recent trends in the field of computer science and its applications
2. formulate the problem definition, analyze and do functional simulation of the same
3. design, implement, test and verify the proposed solution related to problem definition
4. compile, comprehend and present the work carried out

L	T	P	C
3	0	2	4

Course Code	3CS12D101
Course Name	Embedded System Security

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the basics of embedded firmware, hardware and software vulnerabilities and their causes
2. identify the vulnerabilities related to embedded systems using state of the art tools and technologies
3. **understand and apply countermeasures against the introduced attacks**

L	T	P	C
3	0	2	4

Course Code	3CS12D102
Course Name	Wireless Networks

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to
1. recognize design issues involved in different wireless networks
2. employ available technologies to satisfy various application requirements
3. analyze proposed technological solutions

L	T	P	C
3	**0**	**2**	**4**

Course Code	**3CS12D103**
Course Name	**Data Privacy**

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to –

1. comprehend the concepts of web security and privacy, hardware and software vulnerabilities and protection mechanisms
2. realize the need for data privacy and the related technologies
3. derive and demonstrate the protection mechanisms against several data related attacks

L	T	P	C
3	0	2	4

Course Code	3CS12D104
Course Name	Internet of Things

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the architectural components and platforms of IoT ecosystem
2. apply appropriate access technology and protocol as per the application requirement
3. identify data analytics and data visualization tools as per the problem characteristics

L	T	P	C
3	0	2	4

Course Code	3CS12D105
Course Title	Distributed Systems

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to
1. comprehend the computing models for distributed environment
2. analyse the distributed systems in the context of various performance parameters
3. apply the modern concepts of distributed databases and distributed file systems

L	T	P	C
2	0	2	3

Course Code	3CS12D201
Course Name	Blockchain Technology

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the structure of a Blockchain networks
2. evaluate security issues relating to Blockchain and cryptocurrency
3. design and analyze the applications based on Blockchain technology

L	T	P	C
2	0	2	3

Course Code	3CS12D202
Course Title	Human Computer Interaction

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. evaluate user interfaces and detect usability problems by doing usability studies with human subjects
2. simulate how a user would understand and attempt to use an interface using an analytical method such as cognitive walkthrough
3. apply an appropriate interaction style for a given need
4. implement the HCI techniques to build multimodal GUI

L	T	P	C
2	0	2	3

Course Code	3CS12D203
Course Name	Soft Computing

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend different soft computing techniques
2. solve single-objective and multi-objective optimization problems using soft computing and evolutionary techniques
3. apply soft computing to solve problems for various application domains

L	T	P	C
2	0	2	3

Course Code	3CS12D204
Course Title	Introduction to Robotics

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the basic concepts of Robot design, functioning and its applications
2. correlate the integrated working of drives and sensors in Robots
3. analyze robot kinematics and design relevant programs

L	T	P	C
2	0	2	3

Course Code	3CS12D205
Course Title	Mobile and Wireless Network Security

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to -

1. comprehend the fundamental concepts of mobile and wireless network security
2. identify security threats in wireless networks and design strategies to manage network security
3. design secured network application considering all possible threats

L	T	P	C
3	0	2	4

Course Code	3CS12D301
Course Name	Big Data Systems

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. analyse the big data analytic techniques for business applications.
2. manage big data using different tools and frameworks.
3. design efficient algorithms for mining the data from large volumes.
4. implement the HADOOP and MapReduce technologies associated with big data analytics

L	T	P	C
3	0	2	4

Course Code	3CS12D302
Course Name	Deep Learning and Applications

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the strengths and weaknesses of deep networks
2. analyze suitability of different deep networks for variety of problems
3. design and implement deep networks for solving problems pertaining to computer science and interdisciplinary research

L	T	P	C
3	0	2	4

Course Code	3CS12D303
Course Name	Cloud Computing

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. describe the hardware and software concepts and architecture of cloud computing
2. recognize the importance of virtualization technology in support of cloud computing
3. explore the basic ideas and principles in data center design, cloud management techniques and cloud software deployment considerations,
4. analyse the issues related to cloud computing data centres

L	T	P	C
3	0	2	4

Course Code	3CS12D304
Course Name	Multicore and GPU Computing

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend modern multi-core processor micro-architectures and interconnect technologies
2. analyse the memory hierarchy and performance characteristics
3. recognize the need for atomic operations and variety of locking mechanisms
4. explore architecture of general purpose graphics processing units and their common programming models

L	T	P	C
3	0	2	4

Course Code	3CS12D305
Course Title	High Speed Networks

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. demonstrate the knowledge of network planning and optimization of high speed networks
2. apply knowledge related to the building blocks and operation of high speed networking protocols, architectures and applications
3. analyze critically and reflect on the relations and interrelations of the designed network
4. design, optimize and troubleshoot high-speed networks, optical networks

L	T	P	C
3	0	2	4

Course Code	3CS12D306
Course Title	Secured Software Design and Enterprise Computing

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. differentiate between various software vulnerabilities
2. identify software process vulnerabilities for an organization
3. monitor resources consumption in a software
4. interrelate security and software development process

Semester-III

L	T	P	C
-	-	-	14

Course Code	3CS1302
Course Title	Major Project Part–I

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. Understand the issues related with the recent trends in the field of engineering and its applications
2. Formulate the problem definition, analyze and do functional simulation of the same
3. Design, Implement, test and verify the engineering solution related to problem definition
4. Compile, Comprehend and Present the work carried out
5. Manage Project

Semester-IV

L	T	P	C
-	-	-	14

Course Code	3CS1402
Course Title	Major Project Part-II

At the end of the course, the students will be able to –

1. Understand the issues related with the recent trends in the field of engineering and its applications
2. Formulate the problem definition, analyze and do functional simulation of the same
3. Design, Implement, test and verify the engineering solution related to problem definition
4. Compile, Comprehend and Present the work carried out
5. Manage Project