

**NIRMA UNIVERSITY**

**Institute of Technology**

**M Tech Computer Science and Engineering (Information and Network Security)**

**Semester – I**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
3	0	2	4

<b>Course Code</b>	3CS1109
<b>Course Title</b>	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

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
3	0	2	4

<b>Course Code</b>	3CS1110
<b>Course Name</b>	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

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
3	0	2	4

<b>Course Code</b>	3CS2101
<b>Course Name</b>	System and Network Security

**Course Learning Outcomes (CLOs):**

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

1. identify the security based vulnerabilities in operating systems and networks
2. illustrate the attacks on various operating systems and related prevention techniques
3. apply various defensive techniques to protect network based systems

L	T	P	C
3	0	2	4

<b>Course Code</b>	3CS2102
<b>Course Name</b>	Cryptography

### Course Learning Outcomes (CLO):

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

1. understand the mathematical foundations to modern cryptographic techniques
2. critically evaluate symmetric and asymmetric cryptographic techniques
3. evaluate modern cryptographic techniques such as Digital Signatures and Hashing

L	T	P	C
3	0	2	4

<b>Course Code</b>	3CS1111
<b>Course Name</b>	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	0	3

<b>Course Code</b>	3CS1113
<b>Course Name</b>	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

<b>Course Code</b>	3SP1103
<b>Course Title</b>	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
3	0	2	4

<b>Course Code</b>	3CS12D302
<b>Course Name</b>	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

<b>Course Code</b>	3CS12D101
<b>Course Name</b>	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

<b>Course Code</b>	3CS12D102
<b>Course Name</b>	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
2	0	2	3

<b>Course Code</b>	3CS12D201
<b>Course Name</b>	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

<b>Course Code</b>	3CS12D202
<b>Course Title</b>	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

<b>Course Code</b>	3CS22D202
<b>Course Name</b>	Quantum Computing

**Course Learning Outcomes (CLOs):**

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

1. comprehend the principles of mathematics and physics of quantum computation
2. identify applications of quantum computing
3. apply various security measures for quantum communication

L	T	P	C
3	0	2	4

<b>Course Code</b>	3CS12D306
<b>Course Title</b>	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