The National Institute of Engineering, Mysuru

M.Tech. Scheme of Teaching and Examination – 2025- 26

I SEMESTER

Sl. No.	Course Type	Course Code	Course Title	Teaching Hours per Week			Examination				Credits
				Lecture	Practical / Seminar	Tutorial / Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	P	T/ SDA					
1	BSC/PCC	MCS101	Artificial Intelligence	03	00	00	03	50	50	100	3
2	IPCC	MCS102	Data Science and Management	03	00	00	03	50	50	100	3
3	PCC	MCS103	Data Structures & Algorithms for Problem Solving	03	00	00	03	50	50	100	3
4	PEC	MCS104G	Advances in Computer Networks	03	02	00	03	50	50	100	4
5	PEC	MCS105C	Cryptography and Network Security	02	02	00	03	50	50	100	3
6	PCCL	MCSL106	Algorithms & AI Lab	00	02	00	03	50	50	100	2
7	NCMC	MRMI107	Research Methodology & IPR (VTU Online - online.vtu.ac.in)	Online Course (online.vtu.ac.in)							PP
				Total				300	300	600	18

Note: BSC - Basic Science Courses, IPCC - Integrated Professional Core Courses, PCC - Professional Core, PEC – Professional Elective Course, MCC - Mandatory Credit Course, PCCL - Professional Core Course lab, MPS - Minor Project & Seminar, SP - Societal Project, PROJ – Project, OE - Open Elective, INT – Internship, NCMC – Non Credit Mandatory Course

Course	No. of Courses	No. of Credits
BSC/PCC	01	03
IPCC	01	04
PCC	01	03
PEC	02	06
NCMC- RM&IPR	01	00
PCCL	01	02
Total	08	18

Course Code: MCS101 **Course:** Artificial Intelligence
Credits: 3 L:T:P 3:0:0
CIE: 50 Marks **SEE:** 50 Marks
SEE Hours: 3 **Max. Marks:** 100

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Explain the foundational concepts of artificial intelligence, including its history, types, and key problem-solving techniques.	L2
CO2	Apply knowledge representation and reasoning techniques to solve complex problems in AI systems.	L3
CO3	Implement machine learning algorithms and evaluate their performance in real-world applications.	L2
CO4	Explore the principles and applications of natural language processing and robotics to enhance human-computer interaction.	L4

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	3			2	
CO2			3		3
CO3		2			
CO4	2				

Course Structure

Module – 1	
Module 1: Introduction to Artificial Intelligence and Problem Solving, Definition and scope of AI, History and evolution of AI, Types of AI: Narrow AI vs. General AI, Problem formulation and problem-solving techniques, Search algorithms: Uninformed and informed search strategies, Heuristic search and constraint satisfaction problems.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 2	
Module2: Knowledge Representation and Reasoning, Types of knowledge representation, Propositional logic and first-order logic, Semantic networks and frames, Ontologies and their applications, Deductive and inductive reasoning, Rule-based systems and non-monotonic reasoning, Probabilistic reasoning and Bayesian networks.	
Teaching-Learning Process	Chalk and talk / PPT / case study / web content
Module – 3	
Module 3: Machine Learning, Introduction to machine learning, Supervised, unsupervised, and reinforcement learning, Common algorithms: Decision trees, SVM, neural networks Evaluation metrics for machine learning models ,Practical applications of machine learning in AI systems.	
Teaching-Learning Process	Chalk and talk / PPT / case study / web content
Module – 4	
Module 4: Natural Language Processing and Robotics, Basics of natural language processing (NLP), Text processing and language models, Sentiment analysis and language generation, Robotics fundamentals and sensor technologies, Robotkinematics, control, and applications of AI in robotics.	
Teaching-Learning Process	Chalk and talk / PPT / case study / web content
Module – 5	
Module 5: Ethical and Societal Implications of AI, Ethical considerations in AI development, AI and job displacement, Privacy concerns and data security, Bias and fairness in AI algorithms, Accountability and transparency in AI systems, The role of government and regulation in AI, Public perception and trust in AI technologies, Future of AI and its impact on society.	
Teaching-Learning Process	Chalk and talk / PPT / case study / web content

Text Books:

"Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, 4th Edition (2021)

"Deep Learning" by Ian Good fellow, Yoshua Bengio, and Aaron Courville third Edition.

Reference Books:

"Pattern Recognition and Machine Learning" by Christopher M. Bishop Edition: fourth Edition (2020)

"Artificial Intelligence: Foundations of Computational Agents" by David L. Poole and Alan K. Mackworth Edition: third Edition (2021).

Web links and Video Lectures (e-Resources):

https://cs221.stanford.edu

https://www.kaggle.com/learn/machine-learning

https://www.youtube.com/playlist?list=PLkDaE6sXhPqQ5s2cW2g1iGgC4eD9W6xZ2

https://www.youtube.com/playlist?list=PLD6B6F0A3B1D4D3D8A7E3C5E8A7B2E0C

Course Code:MCS102
Credits: 3
CIE: 50 Marks
SEE Hours: 3

Course: Data Science and Management
L:T:P 3:0:0
SEE: 50 Marks
Max. Marks: 100

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Explore the foundational concepts of data science, history, significance, and process.	L3
CO2	Apply statistical methods and data analysis techniques to interpret and draw insights from complex datasets.	L3
CO3	Implement various machine learning algorithms and assess their performance using appropriate evaluation metrics in real-world scenarios.	L2
CO4	Utilize data visualization tools and techniques to effectively communicate findings and insights to diverse audiences.	L4

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	-	-	3	-	-
CO2	3	-	-	2	2
CO3	3	-	2	2	2
CO4	-	3	2	2	2

Course Structure

Module – 1	
Module 1: Introduction to Data Science and R Tool, Overview of Data Science Importance of Data Science in Engineering ,Data Science Process , Data Types and Structures, Introduction to R Programming, Basic Data Manipulation in R, Simple programs using R. Introduction to RDBMS: Definition and Purpose of RDBMS Key Concepts: Tables, Rows, Columns, and Relationships, SQL Basics: SELECT, INSERT, UPDATE, DELETE Importance of RDBMS in Data Management for Data Science	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 2	
Module 2: Linear Algebra for Data Science, Algebraic View, Vectors and Matrices, Product of Matrix & Vector, Rank and Null Space, Solutions of Over determined Equations, Pseudoinverse, Geometric View, Vectors and Distances, Projections, Eigen value Decomposition.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 3	
Module 3: Statistical Foundations, Descriptive Statistics, Notion of Probability, Probability Distributions Understanding Univariate and Multivariate Normal Distributions, Mean, Variance, Covariance, and Covariance Matrix, Introduction to Hypothesis Testing, Confidence Intervals for Estimates.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 4	
Module 4: Optimization and Data Science Problem Solving, Introduction to Optimization Understanding Optimization Techniques, Typology of Data Science Problems, Solution Framework for Data Science Problems.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 5	
Module 5: Regression and Classification Techniques, Linear Regression ,Simple Linear Regression and Assumptions, Multivariate Linear Regression, Model Assessment and Variable Importance, Subset Selection, Classification Techniques, Classification using Logistic Regression.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks**

Two assignments each of **20 Marks** or **one Skill Development Activity of 40marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
The question paper will have ten full questions carrying equal marks.
Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
Each full question will have a sub-question covering all the topics under a module.
The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:

Text Books:
"Python for Data Analysis" by Wes Mc Kinney, 2nd Edition (2018)
"Data Science from Scratch: First Principles with Python" by Joel Grus, 2nd Edition (2019)

Reference Books:
"An Introduction to Statistical Learning" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Toshigami, 2nd Edition (2021)
"The Elements of Statistical Learning" by Trevor Hastie, Robert Toshigami, and Jerome Friedman, 2nd Edition (2009)
"Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking" by Foster Provost and Tom Fawcett, 2nd Edition (2013)

Web links and Video Lectures (e-Resources):
https://www.coursera.org/specializations/jhu-data-science
https://www.kaggle.com/learn/data-science
https://www.edx.org/professional-certificate/harvardx-data-science
https://www.youtube.com/playlist?list=PL4cUxeGkcC9g1s4L6G8p8Fq5XK6Pq7b1k

Skill Development Activities Suggested

The students with the help of the course teacher can take up relevant technical activities which will enhance their skill. The prepared report shall be evaluated for CIE marks.

Course Code: MCS103 **Course:** Data Structures & Algorithms for Problem Solving
Credits: 3 L:T:P 3:0:0
CIE: 50 Marks **SEE:** 50 Marks
SEE Hours: 3 **Max. Marks:** 100

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Analyze and apply fundamental data structures and algorithms to solve complex computational problems effectively.	L4
CO2	Evaluate and implement various searching, sorting to optimize algorithm performance.	L5
CO3	Design and analyze advanced tree and graph algorithms, including balanced search trees and graph traversal methods, to address real-world applications.	L5

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	–	3	2	2
CO2	3	–	3	2	2
CO3	3	–	3	3	2
CO4	3	–	3	2	2

Course Structure

Module – 1	
Search Trees: Two Models of Search Trees. General Properties and Transformations. Height of a Search Tree. Basic Find, Insert, and Delete. Returning from Leaf to Root. Dealing with Non unique Keys. Queries for the Keys in an Interval. Building Optimal Search Trees. Converting Trees into Lists. Removing a Tree. Balanced Search Trees: Height-Balanced Trees. Weight-Balanced Trees. (a,b)- And B-Trees. Red-Black Trees and Trees of Almost Optimal Height. Top-Down Rebalancing for Red-Black Trees.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 2	
Tree Structures for Sets of Intervals. Interval Trees. Segment Trees. Trees for the Union of Intervals. Trees for Sums of Weighted Interval. Trees for Interval-Restricted Maximum Sum Queries. Orthogonal Range Trees. Higher-Dimensional Segment Trees. Other Systems of Building Blocks. Range-Counting and the Semi group Model. Kd-Trees and Related Structures.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 3	
Heaps: Balanced Search Trees as Heaps. Array-Based Heaps. Heap-Ordered Trees and Half Ordered Trees. Leftist Heaps. Skew Heaps. Binomial Heaps. Changing Keys in Heaps. Fibonacci Heaps. Heaps of Optimal Complexity. Double-Ended Heap Structures and Multi dimensional Heaps. Heap-Related Structures with Constant-Time Updates.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 4	
Graph Algorithms: Bellman - Ford Algorithm; Single source shortest paths in a DAG; Johnson's Algorithm for sparse graphs; Flow networks and Ford-Fulkers on method; Maximum bipartite matching. Polynomials and the FFT: Representation of polynomials; The DFT and FFT; Efficient implementation of FFT.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 5	
String-Matching Algorithms: Naïvestring Matching; Rabin-Karp algorithm; String matching with finite automata; Knuth-Morris-Pratt algorithm; Boyer – Moore algorithms.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

ThreeUnitTestseachof**20Marks**

Two assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the COs and POs

The sum of three tests, two assignments / Skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the

outcome defined for the course.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
The question paper will have ten full questions carrying equal marks.
Each full question is for20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
Each full question will have a sub-question covering all the topics under a module.
The students will have to answer five full questions, selecting one full question from each module.

Suggested Learning Resources:

Text Books:
Advanced Data Structures, Peter Brass, Cambridge University Press, 2008.
Kenneth A. Berman. Algorithms. Cengage Learning. 2002.
T.H Cormen, C.E Leiserson, R.L Rivest and C Stein. Introduction to Algorithms. PHI, 3rd Edition, 2010

Reference Books:
Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, 4th Edition, 2014, Pearson.
Data Structures with Java, Ford and Topp, Pearson Education.
Ellis Horowitz, SartajSahni, S. Rajasekharan. Fundamentals of Computer Algorithms. Universities press.2nd Edition, 2007
Data Structures and Algorithms in Java, M.T. Goodrich, R. Tomassia, 3rd Edition, Wiley India Edition.

Web links and Video Lectures (e-Resources):
https://www.coursera.org/learn/advanced-data-structures
https://nptel.ac.in/courses/106106133 https://pages.cs.wisc.edu/~shuchi/courses/787-F07/about.html
https://www.youtube.com/watch?v=0JUN9aDxVmI&list=PL2SOU6wwxB0uP4rJgf5ayhHWgw7akUWSf

Skill Development Activities Suggested
The students with the help of the course teacher can take up relevant technical activities which will enhance their skills. The prepared report shall be evaluated for CIE marks.

Course Code: MCS104G
Credits: 4
CIE: 50 Marks
SEE Hours: 3

Course: Advances in Computer Networks
L:T:P 3:0:2
SEE: 50 Marks
Max. Marks: 100

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	List and classify network services, protocols and architectures, explain why they are layered.	L1
CO2	Choose key Internet applications and their protocols and apply to develop their own applications (e.g. Client Server applications, Web Services) using the sockets API.	L3
CO3	Develop effective communication mechanisms using techniques like connection establishment, queuing theory, recovery Etc.	L2

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	–	–	3	2	2
CO2	3	–	3	2	3
CO3	3	–	3	3	2

Course Structure

Module – 1	
Foundation: Building a Network, Requirements, Perspectives, Scalable Connectivity, Cost-Effective Resource sharing, Support for Common Services, Manageability, Protocol layering, Performance, Bandwidth and Latency, Delay X Bandwidth Product, Perspectives on Connecting, Classes of Links, Reliable Transmission, Stop-and-Wait , Sliding Window, Concurrent Logical Channels.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 2	
Internetworking I: Switching and Bridging, Datagram's, Virtual Circuit Switching, Source Routing, Bridges and LAN Switches, Basic Internetworking (IP), What is an Internetwork?, Service Model, Global Addresses, Datagram Forwarding in IP, sub netting and classless addressing, Address Translation (ARP), Host Configuration (DHCP), Error Reporting (ICMP), Virtual Networks and Tunnels.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 3	
Internetworking- II: Network as a Graph, Distance Vector (RIP), Link State (OSPF), Metrics, The Global Internet, Routing Areas, Routing among Autonomous systems (BGP), IP Version 6 (IPv6), Mobility and Mobile IP.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 4	
End-to-End Protocols: Simple Demultiplexer (UDP), Reliable Byte Stream (TCP), End-to-End Issues, Segment Format, Connecting Establishment and Termination, Sliding Window Revisited, Triggering Transmission, Adaptive Retransmission, Record Boundaries, TCP Extensions, Queuing Disciplines, FIFO, Fair Queuing, TCP Congestion Control, Additive Increase/ Multiplicative Decrease, Slow Start, Fast Retransmit and Fast Recovery.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 5	
Congestion Control and Resource Allocation Congestion-Avoidance Mechanisms, DEC bit, Random Early Detection (RED), Source-Based Congestion Avoidance. The Domain Name System (DNS), Electronic Mail (SMTP, POP, IMAP, MIME), World Wide Web (HTTP), Network Management (SNMP).	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks**

Two assignments each of **20Marks** or **one Skill Development Activity of 40 marks** to attain the COs and POs

The sum of three tests, two assignments/ skill Development Activities, will be scaled down to 50 marksCIE

methods/ question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
The question paper will have ten full questions carrying equal marks.
Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
Each full question will have a sub-question covering all the topics under a module.
The students will have to answer five full questions, selecting one full question from each module.

Text Books:
Computer Networks: A System Approach, Larry Peterson and Bruce S Davis, Elsevier, 5th Edition 2014
Internetworking with TCP/IP, Principles, Protocols and Architecture,Douglas E Comer, PHI, 6th Edition 2014.

Reference Books:
Computer Networks, Protocols, Standards and Interfaces, Uyless Black, PHI, 2nd Edition
TCP/IP Protocol Suite, Behrouz A Forouzan, Tata McGraw-Hill, 4th Edition.

Web links and Video Lectures (e-Resources):
https://www.udemy.com/course/computer-networks-for-beginners-from-zero-to-hero/
https://www.youtube.com/watch?v=f5ksLu5Xjnk&list=PLG9aCp4uE-s3Mmbn4q5J87OriIN3CuFDS
https://sites.google.com/site/computernetworksfall2009/course-outline

Skill Development Activities Suggested
The students with the help of the course teacher can take up relevant technical –activities which will enhance their skill. The prepared report shall be evaluated for CIE marks.

Course Code: MCS105C
Course: Cryptography and Network Security
Credits: 3
L:T:P 2:0:2
CIE: 50 Marks
SEE: 50 Marks
SEE Hours: 3
Max. Marks: 100

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	To explain the foundational concepts of cryptography, including symmetric and Asymmetric encryption, and their applications in securing data.	L1
CO2	To analyze and evaluate various network security protocols, such as SSL/TLS and IPsec, to understand their roles in maintaining data confidentiality and integrity.	L3
CO3	To implement cryptographic techniques, including hashing and digital signatures, to ensure data authenticity and integrity in software applications.	L2
CO4	To identify common security threats and vulnerabilities in network systems and propose effective countermeasures to mitigate these risks.	L4

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	–	–	3	2	2
CO2	3	–	3	3	2
CO3	3	–	3	2	2
CO4	3	–	3	3	2

Course Structure

Module – 1	
Module 1: Introduction to Cryptography, Basics of Cryptography, History and importance, Symmetric vs. asymmetric cryptography, Classical Cryptosystems, Substitution ciphers, Transposition ciphers, Modern Cryptography, Block ciphers (AES, DES),Stream ciphers.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 2	
Module 2: Public Key Cryptography, RSA Algorithm, Key generation, Encryption and decryption, Key Management , Public key infrastructure (PKI), Digital certificates, Elliptic Curve Cryptography (ECC), Basics and applications.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 3	
Module 3: Cryptographic Hash Functions, Hash Functions, Properties and applications, SHA family of hash functions , Message Authentication Codes (MACs) ,HMAC and its applications, Digital Signatures Concepts and algorithms, Verification and applications.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 4	
Module 4: Network Security Protocols, Secure Socket Layer (SSL)/ Transport Layer Security (TLS), Architecture and operation , Internet Protocol Security (IPsec), Modes of operation, Security associations Virtual Private Networks (VPNs), Concepts and implementations.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content
Module – 5	
Module 5:Security Threats and Counter measures, Network Security Threats, Types of attacks (DoS, DDoS, phishing), Malware and its impact, Intrusion Detection Systems (IDS), Types and methodologies Firewalls and Security Policies , Types of firewalls, Designing security policies.	
Teaching - Learning Process	Chalk and talk / PPT / case study / web content

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks.Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks**

Two assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks CIE methods/ question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will beproportionately reduced to 50.
The question paper will have ten full questions carrying equal marks.
Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
Each full question will have a sub-question covering all the topics under a module.
The students will have to answer five full questions, selecting one full question from each module.

Suggested Learning Resources:
Text Books:
William Stallings, "Cryptography and Network Security: Principles and Practice," Pearson Education.
Behrouz A. Forouzan, "Cryptography and Network Security," McGraw-Hill.

Reference Books:
Charles P. Pfleeger, "Security in Computing," Prentice Hall.
Bruce Schneier, "Secrets and Lies: Digital Security in a Networked World," Wiley.

Web links and Video Lectures (e-Resources):
https://www.coursera.org/learn/crypto
https://www.youtube.com/playlist?list=PLzHjzB7Q0q7WgH3m8pY5MZgRzQm5Z84aC
https://www.edx.org/professional-certificate/ritx-cybersecurity-fundamentals
https://www.youtube.com/playlist?list=PL5eH0n1q4D9hA6XkzJ5n7F8tT8Gz4r4uG
https://www.khanacademy.org/computing/computer-science/cryptography

Skill Development Activities Suggested
The students with the help of the course teacher can take up relevant technical–activities which will enhance their skill. The prepared report shall be evaluated for CIE marks.

Course Code: MCSL106 **Course:** Algorithms & AI Laboratory
Credits: 2 L:T:P 0:0:2
CIE: 40 Marks **SEE:**60 Marks
SET Hours: 3 **Max. Marks:** 100

Laboratory outcome
The student should be able to:

Sl. No.	Description	Blooms Level
CO1	Implement and demonstrate AI algorithms.	
CO2	Evaluate different algorithms.	

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	–	3	2	2
CO2	3	–	3	3	2

Programs List:

1.	Implement a simple linear regression algorithm to predict a continuous target variable based on a given dataset.
2.	Develop a program to implement a Support Vector Machine for binary classification. Use a sample dataset and visualize the decision boundary.
3.	Develop a simple case-based reasoning system that stores instances of past cases. Implement a retrieval method to find the most similar cases and make predictions based on them.
4.	Write a program to demonstrate the ID3 decision tree algorithm using an appropriate dataset for classification.
5.	Build an Artificial Neural Network by implementing the Backpropagation algorithm and test it with suitable datasets.
6.	Implement a KNN algorithm for regression tasks instead of classification. Use a small dataset, and predict continuous values based on the average of the nearest neighbors.
7.	Create a program that calculates different distance metrics (Euclidean and Manhattan) between two points in a dataset. Allow the user to input two points and display the calculated distances.
8.	Implement the k-Nearest Neighbor algorithm to classify the Iris dataset, printing both correct and incorrect predictions.
9.	Develop a program to implement the non-parametric Locally Weighted Regression algorithm, fitting data points and visualizing results.
10.	Implement a Q-learning algorithm to navigate a simple grid environment, defining the reward structure and analyzing agent performance.

Conduct of Practical Examination:
Experiment distribution.
For laboratories having only one part: Students are allowed to pick one experiment fromthe lot with equal opportunity.
For laboratories having PART A and PART B: Students are allowed to pick oneexperiment from PART A and one experiment from PART B, with equal opportunity.
Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
Marks Distribution (Courseed to change in accoradance with university regulations)
For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15 =100 Marks.
For laboratories having PART A and PART B
Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks
Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks