



An Autonomous Institute
Shree Warana Vibhag Shikshan Mandal's
**Tatyasaheb Kore Institute of
Engineering And Technology,
Warananagar**

Department of Computer Science & Engineering

Final Year
Bachelor in Technology (B.Tech)
in
Computer Science & Engineering
(Syllabus Structure and Curriculum as per NEP 2020
w.e.f. AY 2026-27)



B. Tech. Computer Science & Engineering

Syllabus Structure and Curriculum as per NEP 2020 w.e.f. AY 2026-27

SWVSM'S
Tatyasaheb Kore Institute of Engineering and Technology, Warananagar
An Autonomous Institute

Abbreviations

Sr. No.	Acronym	Definition
1	ISE	In-Semester Examination
2	ISE-I	In-Semester Examination-I
3	ISE-II	In-Semester Examination-II
4	ESE	End-Semester Examination
5	ISA	In-Semester Assessment (Term Work)
6	L	Lecture
7	T	Tutorial
8	P	Practical
9	CH	Contact Hours
10	C	Credit

Course/ Subject Categories

Sr. No.	Acronym	Definition
1	PCC	Professional Core Course
2	PEC	Professional Elective Course
3	MDM	Multidisciplinary Minor
4	OE	Open Elective Course
5	HSSM	Humanities Social Science and Management
6	ELC	Experiential Learning Course
7	VSEC	Vocational and Skill Enhancement Course
8	AEC	Ability Enhancement Course

Course/ Subject Code

F.Y.B.Tech Syllabus Change Year	UG/ PG	Course Category with Number	Separator	Branch Code	Sem	Course Number	
23	UG	PCC/PEC/MDM/ELC	-	CSE	7	0	1

Course Term Work and POE Code

F.Y.B.Tech Syllabus Change Year	UG/ PG	Course Category with Number	Separator	Branch Code	Sem	Course Number		T-Term Work P- POE A – Audit Course
23	UG	PCC/PEC/MDM/ELC	-	CSE	7	0	1	T / P / A

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

An Autonomous Institute

Department of Computer Science & Engineering

Curriculum Structure, Credits and Evaluation Scheme as per NEP 2020

Vision

To become center of excellence in the field of Computer Science and Engineering and develop competent IT technocrats

Mission

- To develop engineering graduates with high degree of professional excellence
- To excel in academics and research through contemporary and real world problems
- To enhance graduate employability through work based learning in social entrepreneurship
- To encourage industrial and nationally recognized institutes collaboration
- To create an environment to nurture lifelong learning

Program Educational Objectives (PEOs)

Graduates will be,

- Able to design and develop computing system using modern technologies by adapting business intelligence and challenges.
- Able to acquire capabilities with aptitude for higher education and entrepreneurship
- Able to function effectively as professionals having excellent interpersonal skills with ethical and social obligations.
- Able to work efficiently in multidisciplinary and multicultural environment
- Able to lead in their respective domain and contribute positively to the needs of society.

Program Specific Outcomes (PSOs)

Graduate will be able to

- Identify, design and develop solution for real world problems by implementing phases of software development process model
- Analyze and apply the computer science engineering solutions in societal and human context
- Demonstrate the skills and knowledge of contemporary issues in the field of Computer science and Engineering

Quality Policy

- To promote excellence in academic and training activities by inspiring students for becoming competent professionals to cater industrial and social needs.

Program Outcomes (POs)

- The students after successfully completing this programme will have ability to:

PO1: Engineering Knowledge:

Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis:

Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions:

Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems:

Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.(WK8).

PO5: Engineering Tool Usage:

Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World:

Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics:

Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work:

Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication:

Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

PO10: Project Management and Finance:

Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning:

Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8).

Final Year B. Tech.
(Semester – VIII)
in
Computer Science & Engineering
Curriculum Structure, Credits and Evaluation Scheme as per NEP 2020
(to be implemented from w.e.f. Academic Year 2026 - 27)



SWVSM's
**Tatyasaheb Kore Institute of Engineering and Technology,
Warananagar**

Final Year B. Tech. (Computer Science and Engineering)

Semester-VIII (Academic Track)

(to be implemented w.e.f. AY 2026 - 27)

Curriculum Structure, Credit and Evaluation Scheme as per NEP 2020

Sr. No.	Category	Sub Category	Course Code	Course Title	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Program Core Courses	PCC	23UGPCC-CSE801	Agentic AI	3	--	--	3	3	ISE	40	16	40
										ESE	60	24	
2		PCC	23UGPCC-CSE802	Full Stack Development	3	--	--	3	3	ISE	40	16	40
										ESE	60	24	
3	Program Elective Course	PEC-6	23UGPEC4-CSE803-X	Program Electives – 6	3	--	--	3	3	ISE	40	16	40
										ESE	60	24	
		PEC-7	23UGPEC5-CSE804-Y	Program Electives – 7	3	--	--	3	2	ISE	40	16	40
										ESE	60	24	
4	Multidisciplinary Courses	MDM-6	23UGMDM6- CSE805	Fundamentals of Generative AI	2	--	--	2	2	ISA	50	20	
5	Program Core Courses	PCC	23UGPCC-CSE801P	Agentic AI Lab	--	--	2	1	3	ISA	50	20	
6		PCC	23UGPCC-CSE802P	Full Stack Development Lab	--	--	4	2	4	ISA	50	20	
										POE	50	20	
7	Experiential Learning Courses	ELC	23UGELC-CSE806	Project – II	--	--	4	4	4	ISA	100	40	
										OE	100	40	
					14	--	10	21	24	--	800	--	

Note: In theory examination there will be separate passing for ESE and ISE

- **ISE** : In-Semester Examination
- **ESE** : End Semester Examination
- **ISA** : In-Semester Assessment
- **OE** : Oral Examination
- **POE** : Practical Oriented Examination



SWVSM's
**Tatyasaheb Kore Institute of Engineering and Technology,
 Warananagar**

Final Year B. Tech. (Computer Science and Engineering)

Semester-VIII (Academic Track)

(to be implemented w.e.f. AY 2026 - 27)

Multidisciplinary Minor (MDM) & Program Elective Courses Basket

Multidisciplinary Courses Basket (MDM)

MDM – 6			
Category	Sub Category	Course Code	Name of Course
Multidisciplinary Courses	MDM-6	23UGMDM6- CSE805	Fundamentals of Generative AI

Program Electives Courses – 6 Basket (PEC-6)

PEC – 6			
Category	Sub Category	Course Code	Name of Course
Program Elective Course-6	PEC - 6	23UGPEC6-CSE803-1	Information Storage and Retrieval
		23UGPEC6-CSE803-2	Optimization Techniques
		23UGPEC6-CSE803-3	Game Design

Program Electives Courses Basket (PEC-7)

PEC – 7			
Category	Sub Category	Course Code	Name of Course
Program Elective Course-7	PEC - 7	23UGPEC7-CSE804-1	Mobile Virtual Reality and AI
		23UGPEC7-CSE804-2	Statistical Data Analysis : Application to Atmospheric Science
		23UGPEC7-CSE804-3	Technical Communication for Engineers



SWVSM's
Tatyasaheb Kore Institute of Engineering and Technology,
Warananagar

Final Year B. Tech. (Computer Science and Engineering)

Semester-VIII (Internship Track)

(to be implemented w.e.f. AY 2026 - 27)

Curriculum Structure, Credit and Evaluation Scheme as per NEP 2020

Sr. No.	Category	Sub Category	Course Code	Course Title	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component		Marks	Min for Passing
1	Program Core Courses	PCC	23UGPCC-CSE801	Agentic AI	3	--	--	3	3	ISE	40	16	40
										ESE	60	24	
2		PCC	23UGPCC-CSE802	Full Stack Development	3	--	--	3	3	ISE	40	16	40
										ESE	60	24	
3	Multidisciplinary Courses	MDM-6	23UGMDM6-CSE805	Fundamentals of Generative AI	2	--	--	2	2	ISA	50	20	
4	Program Core Courses	PCC	23UGPCC-CSE801P	Agentic AI Lab	--	--	2	1	2	ISA	50	20	
5		PCC	23UGPCC-CSE802P	Full Stack Development Lab	--	--	4	2	4	ISA	50	20	
										POE	50	20	
6	Experiential Learning Courses	ELC	23UGELCCS E804	Industrial Internship	--	--	6	6	6	ISA	100	40	
										OE	100	40	
7			23UGELC-CSE806	Project – II	--	--	4	4	4	ISA	100	40	
										OE	100	40	
					08	--	16	21	24	--	800	--	

Note: In theory examination there will be separate passing for ESE and ISE

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23UGPCC-CSE801 (PCC) -Agentic AI[Click for Syllabus Structure](#)**Teaching Scheme****Lectures** : 3 Hrs/Week**Credits** : 3**Evaluation Scheme****ISE** : 40 Marks**ESE** : 60 Marks**Course Objectives:** The objective of this course is to

1	Explain Agentic AI concepts, architectures, and design patterns.
2	Design effective prompts and reasoning workflows for intelligent agents.
3	Develop autonomous AI agents using modern agent development frameworks.
4	Construct collaborative multi-agent systems for complex problem-solving.
5	Evaluate, deploy, and govern responsible Agentic AI solutions.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Explain the fundamentals of Agentic AI, intelligent agents, architectures, and design patterns.	Understand
CO2	Apply prompt engineering and reasoning techniques to design effective agent workflows.	Apply
CO3	Develop autonomous AI agents using modern agent frameworks, tools, and external resources.	Apply
CO4	Analyze and construct collaborative multi-agent systems for solving complex real-world problems.	Analyze
CO5	Evaluate the performance, safety, ethics, and governance aspects of Agentic AI solutions.	Evaluate

Course Description:

This course introduces the concepts, architectures, and applications of Agentic Artificial Intelligence (AI), focusing on autonomous agents capable of reasoning, planning, decision-making, and tool utilization. Students will learn prompt engineering, agent frameworks, multi-agent systems, retrieval-augmented generation (RAG), and workflow automation. The course emphasizes the design, development, evaluation, and deployment of intelligent AI agents for solving real-world problems while considering safety, ethics, and responsible AI practices.

Prerequisites:	1	Python Programming(23UG-VSEC-CSE407P)
	2	Machine Learning(23UGPCCCSE 602)

Section – I

Unit-1	Foundations of Agentic AI	5 Hours
	Introduction to Artificial Intelligence and Agentic AI, Evolution of AI Systems, Intelligent Agents and Agent Environments, Characteristics of Agentic AI, Agent Architectures, Reactive, Deliberative and Hybrid Agents, Applications of Agentic AI	
Unit-2	Large Language Models and Prompt Engineering	7 Hours
	Introduction to Generative AI and Large Language Models (LLMs), Transformer Architecture Overview, Prompt Engineering Techniques, Zero-shot and Few-shot Prompting, Chain-of-Thought (CoT) Prompting, ReAct	

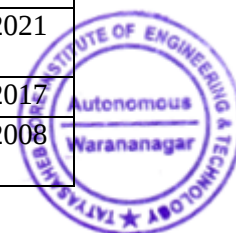


	Framework, Prompt Design for Agentic Systems	
Unit-3	Agent Design, Planning and Reasoning	7 Hours
	Agent Design Patterns, Goal-Oriented Agents, Planning and Decision Making, Reasoning Strategies in Agentic Systems, Memory and Context Management, Reflection and Self-Improvement Mechanisms, Task Decomposition and Autonomous Execution	
Section – II		
Unit-4	Tool-Augmented Agents and Retrieval Systems	7 Hours
	Tool Calling and Function Calling, Integration with APIs and External Services, Retrieval-Augmented Generation (RAG), Knowledge Bases and Vector Databases, Information Retrieval Techniques, Agent Workflows and Automation	
Unit-5	Multi-Agent Systems and Agent Frameworks	7 Hours
	Introduction to Multi-Agent Systems, Agent Communication and Coordination, Agent Collaboration and Task Allocation, Multi-Agent Workflows, Agent Frameworks and Orchestration Platforms, Applications of Multi-Agent Systems	
Unit-6	Evaluation, Safety and Responsible Agentic AI	6 Hours
	Performance Evaluation of Agentic Systems, Agent Testing and Debugging, Hallucination Detection and Mitigation, Security and Privacy in Agentic AI, Ethical and Responsible AI Practices, Governance and Future Trends in Agentic AI	

Mapping of POs & Cos, PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO-1	PSO-2	PSO-3
CO1	3	2	1	-	2	-	-	-	-	-	1	2	1	2
CO2	2	3	2	-	3	-	-	-	-	-	1	3	1	2
CO3	2	3	3	1	3	-	-	-	-	-	1	3	2	3
CO4	2	3	3	2	3	1	-	1	-	-	1	3	3	3
CO5	1	2	2	2	2	3	3	-	-	1	2	2	3	3

References					
Text Books:					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Artificial Intelligence: A Modern Approach	Stuart Russell, Peter Norvig	Pearson	4 th	2021
2	Machine Learning	Tom M. Mitchell	McGraw Hill	1 st	2017
3	Multi-Agent Systems: Algorithmic, Game-Theoretic,	Yoav Shoham, Kevin Leyton-Brown	Cambridge University	1 st	2008



	and Logical Foundations		Press		
Reference Books:					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Artificial Intelligence: Foundations of Computational Agents	David L. Poole, Alan K. Mackworth	Cambridge University Press	3 rd	2023
2	Artificial Intelligence	Elaine Rich, Kevin Knight, Shivashankar B. Nair	McGraw Hill Education	3 rd	2008
SWAYAM Courses (Operational Timestamp: Saturday,06-June-2026 on 3:45PM)					
1	NPTEL Course on Artificial Intelligence Prof. Satyajit Das, Prof. Satyadhyan Chickerur IIT Guwahati, KLE Technological University https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs179				
2	Deep Learning for Natural Language Processing Prof. Pawan Goyal IIT Kharagpur https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs181				
Virtual Lab (Operational Timestamp: Saturday, 06-June-2026 on 3:45PM)					
1	Artificial Intelligence Virtual Lab – Virtual Labs, Ministry of Education https://ai1-iiith.vlabs.ac.in/				



23UGPCC-CSE802 (PCC) -Full Stack Development

[Click for Syllabus Structure](#)

Teaching Scheme

Lectures : 3 Hrs/Week
Credits : 3

Evaluation Scheme

ISE : 40 Marks
ESE : 60 Marks

Course Objectives:

1	To understand the fundamental concepts of full stack development, including client–server architecture and web technologies.
2	To develop proficiency in core Java programming and database connectivity for backend development.
3	To analyze the interaction between frontend, backend, and database components in web applications.
4	To evaluate modern tools, frameworks, and design patterns used in Java-based full stack development
5	To design and implement complete full stack web applications using Java technologies.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Describe the fundamental concepts of full stack development, including client–server architecture, web technologies, and Java-based frameworks	Understand
CO2	Apply core Java programming and database connectivity techniques to develop backend components of web applications.	Apply
CO3	Analyze the structure and interaction of front-end, back-end, and database layers in a full stack Java application	Analyze
CO4	Evaluate various tools, frameworks, and design patterns used in Java-based full stack development with respect to performance, scalability, and security	Evaluate
CO5	Design and implement a complete full stack web application using Java technologies, integrating frontend frameworks, RESTful APIs, and databases.	Create

Course Description :

This course provides a comprehensive introduction to Java Full Stack Development by covering both frontend and backend technologies required to build modern web applications. Students learn the fundamentals of web development, Core Java, Servlets, JSP, Spring Boot, RESTful APIs, and React for creating dynamic and interactive user interfaces. The course also emphasizes database connectivity, authentication, API integration, testing, version control, and deployment practices. Through hands-on exercises and a mini project, students gain practical experience in designing, developing, and deploying end-to-end full stack applications.

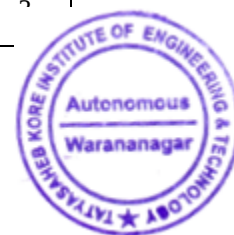
Prerequisites :	1	Object-Oriented Programming Concepts (23UGVEC1-CSE308-1)
	2	Database Management Systems (23UGPCC-CSE502)
	3	Basics of Web Technologies (23UGVSEC-CSE607)



Section – I		
Unit-1	Fundamentals of Web and Full Stack Development	06 Hours
	Introduction to Full Stack Development, Client–Server Architecture, Overview of Web Technologies (HTML5, CSS3, JavaScript),HTTP/HTTPS Protocol and Request–Response Cycle, Introduction to Java-based Web Frameworks,Development Tools and Environment Setup.	
Unit-2	Core Java for Backend Development	08 Hours
	Review of OOP Concepts in Java, Exception Handling and File Handling, Java Collections Framework, Multithreading Basics,JDBC Architecture and API, CRUD Operations using JDBC	
Unit-3	Server-Side Programming with Java	07 Hours
	Introduction to Servlets and Servlet Lifecycle, Handling HTTP Requests and Responses,JavaServer Pages (JSP) and JSTL, Session Management(Cookies, Sessions) ,MVC Architecture in Java Web Applications	
Section – II		
Unit-4	Spring Framework and RESTful Services	08 Hours
	Introduction to Spring Framework and Dependency Injection, Spring Boot Architecture and Configuration, Building RESTful APIs (GET, POST, PUT, DELETE),Data Access using Spring Data JPA / Hibernate, Exception Handling and Validation,Performance and Scalability Considerations	
Unit-5	Frontend Development using React	07 Hours
	Introduction to React and Single Page Applications,Components, Props, and State, Event Handling and Forms,React Hooks (<code>useState</code> , <code>useEffect</code>), API Integration using Fetch/Axios, Routing and Navigation	
Unit-6	Full Stack Integration, Testing, and Deployment	06 Hours
	Integration of React Frontend with Spring Boot Backend, JSON Data Exchange and API Consumption, Authentication and Authorization (Basic/JWT),Version Control using Git, API Testing using Postman,Deployment Strategies (Local/Cloud Basics), Mini Project: End-to-End Full Stack Application.	

Mapping of POs & COs, PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	-	-	1	1	-	-	1	-	1	1	1	2
CO2	3	2	1	1	3	-	-	1	-	-	1	3	1	2
CO3	2	3	2	1	2	1	-	1	1	-	1	2	2	2
CO4	1	2	2	2	3	2	2	1	1	1	2	2	2	3
CO5	2	2	3	2	3	1	1	2	2	2	2	3	2	2



References					
Text Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Spring in Action	Craig Walls	Manning Publications	6 th	2022
2	Full Stack Development with Spring Boot and React	Juha Hinkula	Packt Publishing	4 th	2023
Reference Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Java: The Complete Reference	Herbert Schildt	McGraw Hill	13 th	2024
SWAYAM Courses					
1	NPTEL Course on Programming In Java, IIT Kharagpur Prof. Debasis Samanta https://nptel.ac.in/courses/106105191				



23UGPEC6-CSE803-1 Information Storage and Systems[Click for Syllabus Structure](#)**Teaching Scheme****Lectures** : 2 Hrs/Week**Credits** : 2**Evaluation Scheme****ISE** : 40 Marks**ESE** : 60 Marks**Course Objective:**

1	Understand the fundamental concepts, models, and techniques of Information Retrieval systems.
2	Apply indexing, searching, and evaluation methods for efficient information retrieval.
3	Explore advanced IR applications such as web search, multimedia retrieval, recommendation systems, and Semantic Web technologies.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Explain the fundamental concepts, architecture, indexing techniques and models of Information Retrieval systems.	Understand
CO2	Explain the fundamental concepts, architecture, indexing techniques and models of Information Retrieval systems.	Apply
CO3	Analyze the performance of Information Retrieval systems using standard evaluation metrics and visualization techniques.	Analyze
CO4	Analyze distributed, multimedia and web-based information retrieval techniques including search engines and web scraping.	Analyze
CO5	Evaluate advanced Information Retrieval techniques including XML retrieval, recommendation systems and Semantic Web technologies.	Evaluate

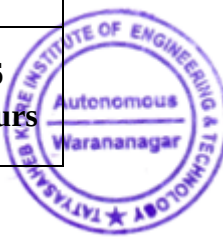
Course Description :

This course covers the fundamentals of Information Retrieval (IR), including indexing, searching, retrieval models, evaluation techniques, web search, multimedia and distributed IR, web scraping, recommendation systems, XML retrieval, and Semantic Web concepts.

Prerequisites :	1	Data Structures and Algorithms (23UG-PCC-CSE303)
	2	Database Management Systems (23UG-PCC-CSE502)
	3	Python Programming (23UG-VSEC-CSE407P)

Section – I

Unit-1	Introduction to Information Retrieval	6 Hours
	Basic Concepts of IR, Data Retrieval & Information Retrieval, Text mining and IR relation, IR system block diagram, Automatic Text Analysis: Luhn's ideas, Conflation Algorithm, Indexing and Index Term Weighting, Probabilistic Indexing, Automatic Classification. Measures of Association, Different Matching Coefficients, Cluster Hypothesis, Clustering Techniques: Rocchio's Algorithm, Single pass algorithm, Single Link algorithm.	
Unit-2	Indexing and Searching Techniques	6 Hours
	Indexing: Inverted file, Suffix trees & suffix arrays, Signature Files, Scatter storage or hash addressing. Searching Techniques: Boolean Search, sequential search, Serial search, cluster-based retrieval, Query languages,	

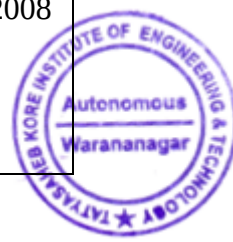


	Types of queries, Patterns matching, structural queries. IR Models: Basic concepts, Boolean Model, Vector Model, Probabilistic Model.	
Unit-3	Evaluation and Visualization of Information Retrieval System	6 Hours
	Performance Evaluation: Precision and recall, MRR, F-Score, NDCG, user-oriented measures. (06 hrs) Visualization in Information System: Starting points, Query Specification, document context, User relevance judgment, Interface support for search process.	
Section – II		
Unit-4	Distributed and Multimedia IR	6 Hours
	Distributed IR: Introduction, Collection Partitioning, Source Selection, Query Processing. Multimedia IR: Introduction, Data Modeling, Query Language, Background-Spatial Access Method, A Generic Multimedia Indexing Approach, One Dimensional Time Series, Two-Dimensional color Images, Automatic Feature Extraction, Trends and Research Issue.	
Unit-5	Web Searching	6 Hours
	Introduction, Challenges, Web Characteristics, Search Engines: Centralized Architecture, Distributed Architecture, User Interfaces, Ranking, Crawling the web, Indices, Browsing, Meta-searchers, Searching using Hyperlinks, Trends and Research Issues, Introduction to Web Scraping: Python for web scraping, Request, HTML parsing, Beautiful Soup.	
Unit-6	Advanced Information Retrieval	6 Hours
	XML Retrieval: Basic XML concepts, Challenges in XML retrieval, Vector space model for XML retrieval, Evaluation of XML retrieval, Text-Centric vs. Data-Centric XML retrieval. Recommendation System: Collaborative Filtering and Content Based Recommendation of Documents and Products. Introduction to Semantic Web.	

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	-	-	-	-	-	-	1	2	–
CO2	2	2	2	2	2	-	-	-	-	-	-	3	3	–
CO3	2	3	2	3	2	-	-	-	-	-	1	2	3	–
CO4	2	3	2	2	2	-	-	-	-	-	1	2	3	–
CO5	2	2	1	2	1	-	-	-	-	-	2	2	3	1

References					
Text Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Introduction to Information Retrieval	Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze	Cambridge University Press	1 st	2008



Reference Books :					
1	Modern Information Retrieval	Ricardo Baeza-Yates, Berthier Ribeiro-Neto	Addison-Wesley	2 nd	2011
2	Information Retrieval: Algorithms and Heuristics	David A. Grossman, Ophir Frieder	Springer	2 nd	2004
3	Search Engines: Information Retrieval in Practice	Bruce Croft, Donald Metzler, Trevor Strohman	Pearson Education (Addison-Wesley)	1 st	2010
4	Mining of Massive Datasets	Jure Leskovec, Anand Rajaraman, Jeffrey D. Ullman	Cambridge University Press	3 rd	2020
5	Web Scraping with Python	Ryan Mitchell	O'Reilly Media	3 rd	2024
SWAYAM Courses					
1	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs13				



23UGPEC6-CSE803-2 Optimization Techniques

[Click for Syllabus Structure](#)

Teaching Scheme

Lectures : 2 Hrs/Week
Credits : 2

Evaluation Scheme

ISE : 40 Marks
ESE : 60 Marks

Course Objectives:

1	To familiarize the students with some basic concepts of optimization techniques and approaches.
2	To formulate a real-world problem as a mathematical programming model.
3	To develop the model formulation and applications are used in solving decision problems.
4	To solve specialized linear programming problems like the transportation and assignment Problems.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Apply operations research techniques like linear programming problem in industrial optimization problems.	Apply
CO2	Solve allocation problems using various OR methods.	Apply
CO3	Understand the characteristics of different types of decision making environment and the appropriate decision making approaches and tools to be used in each type.	Understand
CO4	To solve specialized linear programming problems like the transportation and assignment Problems.	Apply
CO5	Recognize competitive forces in the marketplace and develop appropriate reactions based on existing constraints and resources.	Create

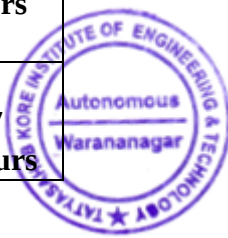
Course Description :

This course covers the mathematical foundations of optimization, classical techniques, and linear programming alongside advanced machine learning and data analytics methods. It equips students with the skills to apply convex analysis, nature-inspired evolutionary algorithms, and multiobjective Pareto optimization to solve complex, real-world data and engineering problems

Prerequisites :	1	Concept of algorithm(23UGPCC-CSE503)
	2	Concept of Data Analysis
	3	Machine Learning(23UGPCC-CSE-602)

Section – I

Unit-1	Mathematical Foundations of Optimization	5 Hours
	Functions and Continuity, Review of Calculus, Vectors, Matrix Algebra, Eigen values and Eigen vectors, Optimization and Optimality, General Formulation of Optimization Problems.	
Unit-2	Algorithms, Complexity and Convexity	5 Hours
	What is an Algorithm? Order Notations (Big O, Ω , Θ), Convergence Rate, Computational Complexity, Convex Sets and Convex Functions, Convexity in Optimization, Stochastic Nature in Algorithms.	
Unit-3	Classical Optimization Techniques	7 Hours
	Unconstrained Optimization, Gradient-Based Methods, Gradient-Free Nelder–Mead Method, Constrained Optimization: Mathematical	



	Formulation, Lagrange Multipliers, Slack Variables, Generalized Reduced Gradient (GRG) Method, KKT Conditions, Penalty Methods, BFGS Method, Trust-Region Method, Sequential Quadratic Programming (SQP), Equality Constrained Optimization, Barrier Functions, Interior-Point Methods, Stochastic and Robust Optimization.	
Section – II		
Unit-4	Linear Programming and Statistical Learning	8 Hours
	Introduction to Linear Programming, Simplex Method, Interior-Point Method for LP, Integer Linear Programming (ILP), LP Relaxation, Branch and Bound Method, Mixed Integer Programming (MIP), Applications of LP, ILP and MIP, Sample Mean and Variance, Regression Analysis, Nonlinear Least Squares, Overfitting and Information Criteria, Regularization and Lasso Method, Logistic Regression, Principal Component Analysis (PCA).	
Unit-5	Machine Learning, Data Analytics and Multiobjective Optimization	7 Hours
	Data Mining, Data Mining for Big Data, Artificial Neural Networks, Support Vector Machines (SVM), Deep Learning, Introduction to Multiobjective Optimization, Pareto Front and Pareto Optimality, Evolutionary Approaches for Multiobjective Optimization.	
Unit-6	Constraint Handling and Nature-Inspired Evolutionary Algorithms	7 Hours
	Introduction to Constraint Handling Techniques, Penalty Function Method, Feasibility Criteria, Evolutionary Computation: Basic Concepts, Genetic Algorithms, Simulated Annealing, Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO), Differential Evolution, Applications of Nature-Inspired Optimization.	

Mapping of POs & Cos, PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	–	–	–	–	–	–	3	2	2
CO2	3	3	2	1	3	–	–	–	–	–	–	3	2	1
CO3	2	3	2	–	2	2	–	–	–	–	2	2	3	2
CO4	3	3	2	1	3	–	–	–	–	–	–	3	2	1
CO5	2	3	3	2	3	2	–	–	–	2	2	3	3	3

Text Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Optimization for Engineering Design: Algorithms and Examples	Kalyanmoy Deb	PHI Learning Pvt. Ltd.	2 nd	2012
2	Engineering Optimization: Theory	Singiresu S. Rao	Wiley India	5 th	2023



	and Practice				
Reference Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Convex Optimization	Stephen Boyd and Lieven Vandenberg he	Cambridge University Press	1 st	2004
2	Introduction to Operations Research	Frederick S. Hillier and Gerald J. Lieberman	McGraw-Hill	10 th	2014
3	Data Mining: Concepts and Techniques	Jiawei Han, Micheline Kamber, and Jian Pei	Morgan Kaufmann (Elsevier)	3 rd	2011
SWAYAM Courses					
1	NPTEL Course on Optimization from fundamentals Prof. Ankur A. Kulkarni IIT, Bombay https://onlinecourses.nptel.ac.in/e-learning/preview/noc25_me60				



23UGPEC6-CSE803-3 Game Designing[Click for Syllabus Structure](#)**Teaching Scheme****Lectures** : 2 Hrs/Week**Credits** : 2**Evaluation Scheme****ISE** : 40 Marks**ESE** : 60 Marks**Course Objectives:**

1	To Understand the fundamental concepts, principles, and history of game design.
2	To Analyze various game genres, mechanics, and player engagement strategies.
3	To Study game development life cycles, design documentation, and project planning.
4	To Explore storytelling, character design, and world-building techniques used in games.
5	To Understand user experience (UX), interface design, and player psychology in games.
6	To Examine emerging trends, technologies, and ethical issues in the gaming industry.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Explain core concepts, genres, and evolution of digital games.	Understand
CO2	Analyze game mechanics, game play elements, and player engagement techniques.	Analyze
CO3	Prepare and evaluate game design documents and development plans.	Evaluate
CO4	Apply principles of storytelling, character creation, and UX design in game design.	Apply
CO5	Assess emerging technologies, business models, and ethical considerations in the gaming industry.	Evaluate

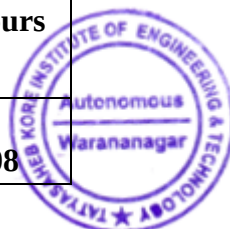
Course Description :

This course introduces the fundamentals of game design and development, covering game genres, gameplay mechanics, storytelling, character and level design, player experience, and the game development life cycle. It explores game design documentation, user interface design, player psychology, quality assurance, and ethical considerations. The course also examines emerging trends such as artificial intelligence, virtual and augmented reality, mobile gaming, eSports, cloud gaming, and modern monetization models, with an emphasis on conceptual understanding and industry practices

Prerequisites :	1	Basic understanding of software development processes and software engineering principles.
	2	Basic knowledge of computer graphics and multimedia systems.
	3	Understanding of object-oriented concepts and problem-solving approaches.

Section – I

Unit-1	Introduction to Game Design	08 Hours
	Evolution and History of Games. Types of Games: Board Games, Video Games, Mobile Games, AR/VR Games , Game Design Fundamentals, Elements of a Game: Goals, Rules, Challenges, Rewards ,Game Development Ecosystem, Roles in Game Development Team, Overview of Game Industry	
Unit-2	Game Genres and Mechanics	08
	Classification of Game Genres :Action ,Adventure , Role Playing Games	

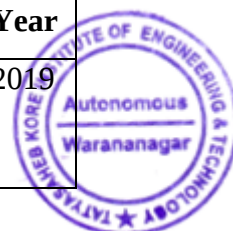


	(RPG) , Strategy Games, Simulation Games, Sports and Casual Games ,Core Game Mechanics, Game play Loops , Balance and Difficulty Design, Level Design Fundamentals, Reward Systems and Progression	Hours
Unit-3	Game Development Process and Documentation	08 Hours
	Game Development Life Cycle , Concept Development, Pre-Production, Production and Post-Production ,Game Design Document (GDD), Project Planning and Scheduling, Agile Development in Games, Testing and Quality Assurance, Game Publishing Process	
Section – II		
Unit-4	Storytelling and Character Design	08 Hours
	Narrative Design in Games, Story Structures and Storyboarding, Interactive Storytelling, Character Design Principles, Character Progression Systems, World Building Techniques, Dialogue Design,Visual Design Concepts	
Unit-5	Player Experience and User Interface Design	07 Hours
	Player Psychology, Motivation and Engagement Models, User Experience (UX) in Games, Human-Computer Interaction in Gaming, User Interface (UI) Design Principles, Accessibility in Games, Game Analytics and Player Feedback, Ethical Design Practices	
Unit-6	Emerging Trends and Business of Gaming	06 Hours
	Mobile Gaming Industry, eSports and Competitive Gaming, Virtual Reality (VR) and Augmented Reality (AR) ,Artificial Intelligence in Games, Cloud Gaming, Monetization Models :Premium Games, Free-to-Play, In-App Purchases, Legal, Social, and Ethical Issues in Gaming,Future Trends in Game Design	

Mapping of POs & COs, PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	1	1	2	-	-
CO2	2	3	2	1	-	-	-	-	-	-	-	3	2	-
CO3	2	2	3	2	1	-	-	-	1	1	2	2	3	-
CO4	1	2	3	-	1	-	-	1	2	2	-	2	2	3
CO5	2	3	-	1	2	2	1	3	1	2	2	2	1	2

References					
Text Books :					
S. N.	Title	Author(s)	Publisher	Edition	Year
1	The Art of Game Design: A Book of Lenses	Jesse Schell	CRC Press /Taylor & Francis	4 th	2019



2	Fundamentals of Game Design	Ernest Adams	Pearson Education	4 th	2014
3	Game Design Workshop: A Play centric Approach to Creating Innovative Games	Tracy Fullerton	CRC Press	5 th	2024
Reference Books :					
S. N.	Title	Author(s)	Publisher	Edition	Year
1	Level Up! The Guide to Great Video Game Design	Scott Rogers	Wiley	3 rd	2014
2	An Architectural Approach to Level Design	Christopher W. Totten	CRC Press	2 nd	2019
SWAYAM Courses					
1	https://onlinecourses.swayam2.ac.in/aic20_ed01/preview				



23UGMDM6-CSE805 (MDM-6) -Fundamentals of Generative AI[Click for Syllabus Structure](#)**Teaching Scheme**
Lectures : 2 Hrs/Week**Evaluation Scheme**
ISA : 50 Marks

Course Objectives:		
1	To understand the fundamental concepts, working principles, capabilities, limitations, and real-world applications of Generative Artificial Intelligence.	
2	To develop effective prompt engineering skills to generate accurate, creative, and context-aware responses from Generative AI models.	
3	To Explore human-AI collaboration in creative domains such as writing, art, music, design, and multimedia content generation.	
4	To analyze advanced Generative AI models, specialized AI systems, software integration techniques, and no-code AI development platforms.	
5	To utilize enterprise AI tools, AI agents, personalized AI systems, and advanced prompting techniques to enhance productivity, creativity, and professional workflows.	
Course Outcomes:		
COs	At the end of successful completion of the course, the students will be able to	Bloom’s Taxonomy
CO1	Explain the fundamentals of Generative AI, distinguish it from traditional AI, identify its capabilities and limitations, and evaluate its practical applications across various domains.	Understand
CO2	Design and optimize effective prompts using prompt engineering principles to obtain accurate, relevant, and context-specific outputs from Generative AI models.	Apply
CO3	Apply Generative AI tools collaboratively in creative domains such as content writing, artwork, music, video generation, and idea development while recognizing best practices and ethical considerations.	Apply
CO4	Compare advanced Generative AI models, customize AI solutions for specialized applications, and evaluate software integration and no-code development approaches.	Analyze
CO5	Utilize specialized Generative AI platforms, enterprise AI tools, autonomous AI agents, and advanced prompting techniques to enhance creativity, productivity, and solve domain-specific problems effectively.	Apply

Course Description :		
This course introduces the fundamentals of Generative Artificial Intelligence (Gen AI), its underlying concepts, and real-world applications across diverse domains. It covers prompt engineering, AI-assisted problem solving, specialized AI tools, autonomous agents, and deployment fundamentals. The course emphasizes hands-on use of modern AI technologies while promoting responsible and ethical AI practices.		
Prerequisites :	1	Statistical Computing (23UG-MDM1-CSE306)
	2	Mathematical Methods in AI and ML(23UGMDM4- CSE606)
	3	Data Analytics with R/Python(23UG-MDM2-CSE405)
	4	Fundamentals of Machine Learning(23UGMDM3- CSE505)
	5	Emerging Trends in AI and Data Science(23UGMDM5-CSE706)
Section – I		

Unit-1	Diving into Generative AI Fundamentals	4 Hours
	What exactly is Generative AI? Unveiling the BIG secret to working successfully with GenAI, Understanding the infamous finger problem and other GenAI quirks, figuring out how to work with GenAI -It's all about your prompts, Discovering the differences in GenAI models and options, Checking out practical uses of GenAI, Separating Gen AI fact from fiction.	
Unit-2	Introducing the Art of Prompt Engineering	4 Hours
	What is a prompt?, Revealing the secret behind successful prompting, Discovering the secret sauce in prompt engineering, Understanding how prompts guide GenAI responses, Crafting effective prompts for diverse AI applications, Tips and Tricks for optimizing your prompts, Using prompts to provide supplemental data for the model, Avoiding common prompting pitfalls.	
Unit-3	Collaborating Creatively with GenAI	4 Hours
	Exploring human-AI partnerships in creative fields : The role of AI in art, music, writing, and video production, Different art forms, same prompting issues, Looking at some benefits of using GenAI as a creative tool, Collaborative success stories	
Section – II		
Unit-4	Exploring Advanced GenAI Models and Techniques	4 Hours
	Leaning on advanced tactics to move your content to another level, Evaluating AI models in terms of your specific needs, Tailoring GenAI models for specialized topics, Customizing AI for industry-specific content, Examples of specialized GenAI models available on the market, dealing with software integration issues, Overcoming common integration challenges, Programming with GenAI no-code options	
Unit-5	Delving into Specialized GenAI Tools	4 Hours
	Discovering the difference enterprise-level AI tools make, Finding mini GPTs and GPT App Stores, Exploring autonomous AI agents and personalized AI, Enhancing creativity and productivity with GenAI, Enhancing readability and reader engagement with GenAI, Mind mapping with GenAI for enhanced idea generation.	
Unit-6	Boosting your prompting and creativity	4 Hours
	Ways GenAI can boost your creativity, Tips for advanced prompting.	

Mapping of POs & COs, PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3



CO1	2	2	-	-	1	1	2	-	-	-	2	1	2	2
CO2	1	2	2	-	3	-	-	-	1	-	-	2	-	3
CO3	-	1	3	-	3	1	3	3	2	-	-	3	2	3
CO4	2	3	2	2	3	-	-	-	1	1	-	3	1	3
CO5	1	2	2	-	3	-	1	2	1	1	-	3	2	3

References					
Text Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	Generative AI for dummies	Pam Baker	A Wiley	1 st	2024
Reference Books :					
S.N.	Title	Author(s)	Publisher	Edition	Year
1	The AI Revolution in Medicine, Engineering and Beyond: GPT-4 and Beyond	Peter Lee, Carey Goldberg, Isaac Kohane	Pearson	1 st	2024
2	Hands-On Large Language Models: Language Understanding and Generation	Jay Alammar, Maarten Grootendorst	O'Reilly Media	1 st	2024
3	AI Engineering: Building Applications with Foundation Models	Chip Huyen	O'Reilly Media	1 st	2025
4	Generative AI with Python and PyTorch	Navin Kumar Manaswi	Apress	1 st	2024
SWAYAM Courses (Operational Timestamp: Saturday,04-July-2026 on 3:45PM)					
1	SWAYAM Course on Generative AI for Everyday Life Dr. Ridip Dev Choudhury and Dr.Nabankur Pathak https://onlinecourses.swayam2.ac.in/e-learning/preview/nou25_ma05				
2	SWAYAM Course on Generative AI for Computer Vision Prof. Arijit Sur IIT Guwahati https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs104				
3	SWAYAM Course on Generative AI and Large Language Models Naveen Kumar Bhansali https://onlinecourses.swayam2.ac.in/e-learning/preview/imb24_mg116				



23UGPCC-CSE801P Agentic AI Lab[Click for Syllabus Structure](#)**Teaching Scheme****Practical** : 2 Hrs/Week**Credits** : 1**Evaluation Scheme****ISA** : 50 Marks

Expt. No.	Experiments	Bloom's Taxonomy
1	Study Google Colab environment and AI development setup for Agentic AI applications	Understand
2	Implement prompt engineering techniques using Gemini LLM for question answering and content generation	Understand
3	Perform Zero-Shot, Few-Shot and Chain-of-Thought prompting using Large Language Models	Analyze
4	Develop a simple AI agent for task execution using prompt-based reasoning	Apply
5	Implement a ReAct (Reasoning and Acting) agent for solving multi-step problems	Apply
6	Develop a tool-augmented AI agent using external utilities and real-time information	Apply
7	Build a Retrieval-Augmented Generation (RAG) pipeline using vector embeddings and document retrieval	Apply
8	Implement a memory-based conversational agent with context retention	Apply
9	Design and simulate a multi-agent collaboration workflow for problem solving	Analyze
10	Evaluate the performance, safety and ethical aspects of Agentic AI systems through case studies and experimental analysis	Evaluate



23UGPCC-CSE802P -Full Stack Development Lab[Click for Syllabus Structure](#)**Teaching Scheme****Practical** : 2 Hrs/Week**Credits** : 1**Evaluation Scheme****ISA** : 50 Marks**POE** : 50 Marks

Expt. No.	Experiment	Bloom's Taxonomy
1	Study and demonstrate basic HTML5 structure and CSS styling for a static web page.	Understand
2	Create a simple web page using JavaScript to demonstrate DOM manipulation and event handling.	Understand
3	Analyze client-server communication by developing a simple form and handling requests using HTTP methods.	Analyze
4	Develop a Java program to perform CRUD operations using JDBC with a MySQL database.	Apply
5	Create a Servlet-based web application to handle user requests and responses.	Apply
6	Design a JSP-based application with session management (login/logout functionality).	Apply
7	Demonstrate the use of Spring Boot to create a basic REST API (GET method).	Understand
8	Implement RESTful services using Spring Boot (GET, POST, PUT, DELETE).	Understand
9	Develop a frontend application using React components, props, and state.	Understand
10	Analyze and integrate a full stack application by connecting React frontend with Spring Boot backend and database.	Analyze



23UGELCCSE804-Industrial Internship

[Click for Syllabus Structure](#)

Teaching Scheme

Credits : 6

Evaluation Scheme

ISA : 100 Marks

OE : 100 Marks

Course Objective: The objective of this course is to

1	Provide exposure to students in industrial or organizational environments and enable them to apply theoretical knowledge of Computer Science and Engineering to real-world problems.
2	Develop the professional skills such as teamwork, communication, problem solving, project management, ethics, and workplace discipline required in the IT industry.
3	Enhance technical competence and career readiness by gaining hands-on experience with current tools, technologies, software development practices, and industry standards.

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Have an exposure to industrial practices and ethical issues at the work environment.	Understand
CO2	Apply appropriate workplace behaviors in a professional environment.	Apply
CO3	Demonstrate content knowledge appropriate to job assignment.	Apply
CO4	Evaluate the internship experience in terms of their personal, educational and career needs.	Evaluate
CO5	Develop the solutions for real world problems in different domains.	Create

Course Description :

This course offers students experiential learning through engagement with professional organizations, industries, or research environments. It enables interns to understand workplace practices, organizational structure, and the practical implementation of engineering concepts in real scenarios. The course encourages the development of analytical thinking, adaptability, interpersonal skills, and professional responsibility. It also helps interns to gain awareness of current industry trends and prepares them for future career opportunities.

Prerequisites :	1	Completion of Minimum Seven Semesters
	2	Knowledge programming languages(C/C++/Java/Python/PHP)
	3	Knowledge of Databases

Details

	Duration: Minimum 8 Weeks	
	Eight weeks of Internship at industry supervised by the industry supervisor at the industry and faculty mentor at institute level.	



Mapping of COs, POs and PSOs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	1	1	-	-	-	2	3	2	2	1	2	-	-	2
CO2	-	-	-	-	-	1	3	3	3	2	2	-	-	2
CO3	3	2	2	1	3	-	-	1	1	-	-	3	2	2
CO4	-	-	-	-	-	-	-	1	2	1	3	-	-	2
CO5	3	3	3	2	3	2	1	2	2	2	2	3	3	2

Term Work	
1	Mode of Evaluation: Internship Report, Presentation and Project Review.
2	Collect the Internship Completion Letter given by authorized industry.
3	Assess the work based on progress report (signed by industry supervisor).

- ISA (In-Semester Assessment) = Institute Assessment + Industry Assessment



23UGELC-CSE806 Project II[Click for Syllabus Structure](#)**Evaluation Scheme**

ISA : 100 Marks

Examination Scheme

OE : 100 Marks

Course Objectives:

1	Learn how to implement their software and/or hardware project in a schedule-driven Process based on their requirements and specification documents
2	Learn how to write a risk management plan and test plan document.
3	Learn how to test their project based on their test plan document.
4	Demonstrate the workable projects with desired output as specified in the design report (Project-I)

Course Outcomes:

COs	At the end of successful completion of the course, the students will be able to	Bloom's Taxonomy
CO1	Review and update the SRS and design document as per need of the project	Plan
CO2	Start implementing the Project as specified in the SRS document	Apply
CO3	Conduct various testing techniques and focus on risk mitigation plan	Analyze
CO4	Write the final Project Report including all the aspects of Project	Compose
CO5	Deliver the final presentation and demonstration on the workable Project	Construct

Course Description :

This course will be conducted largely as an individual or small group project under the direct supervision of a member of academic staff. The specific project topic undertaken will reflect the common interests and expertise of the student(s) and supervisor.

ISA (Term Work)

The ISA will be jointly assessed by a panel of teachers appointed by Head of the Department.

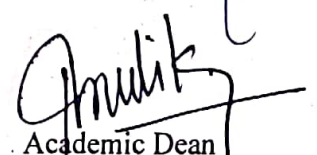
Note

- Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
- Two mid-term evaluations should be done, which includes presentations and demos of the work done.
- Care should be taken to avoid copying and outsourcing of the project work.


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