Shri Vile Parle Kelavani Mandal's

Dwarkadas J. Sanghvi College of Engineering

(Autonomous College Affiliated to the University of Mumbai)

Scheme and detailed syllabus

Final Year B.Tech

in

Artificial Intelligence and Machine Learning

(Semester VII/VIII)

Academic Year 2026-27

Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with 'A" Grade (CGPA : 3.18)

Proposed Scheme for Final Year Undergraduate Program in Artificial Intelligence and Machine Learning: Semester VII/VIII (Autonomous)
Academic Year(2026-27)

	Sr. No.	Course Code	Course	Teaching Scheme				Semester End Examination (A)						Continuous Assessment (B)						Aggregate (A+B)	Credits
				Theory (hrs.)	Practical (hrs.)	Tutorial (hrs.)	Credits	Duration	Theory	Oral	Pract	Oral & Pract	SEE Total(A)	Term Test 1 (TT1)	Term Test 2 (TT2)	Term Test 3 (TT3)	Term Test Total (TT1 +TT2+ TT3)	Term work	CA Total (B)		
PE	1 @	DJS23ACPE811	Responsible AI	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100	3
		DJS23ACPE812	Social Network Analysis	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100	
		DJS23ACPE813	Computational Neuroscience	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100	
OJT	2	DJS23IPELX14	Internship (OJT) cum Project	--	36	--	18	2	--	--	--	200	200	--	--	--	--	400	400	600	18
\ SC	3	DJS23ACSC801	AI in Web3	1	--	--	1	--	--	--	--	--	--	15	15	10	40	--	40	40	1
Total				**4**	**36**	**--**	**22**	**4**	**60**	**--**	**--**	**200**	**260**	**30**	**30**	**20**	**80**	**400**	**480**	**740**	**22**

@ Department Elective

Prepared by | Checked by | HoD | Vice-Principal | Principal

Continuous Assessment (A):

Course	Assessment Tools	Marks	Time (mins)
Theory	a. Term Test 1 (based on 40 % syllabus)	15	45
	b. Term Test 2 (on next 40 % syllabus)	15	45
	c. Assignment / course project / group discussion /presentation / quiz/ any other.	10	--
	Total marks (a + b + c)	40	
Audit course	Performance in the assignments / quiz / power point presentation / poster presentation / group project / any other tool.	--	As applicable
Laboratory	Performance in the laboratory and documentation.	25	
Tutorial	Performance in each tutorial & / assignment.	25	
Laboratory & Tutorial	Performance in the laboratory and tutorial.	50	

Continuous Assessment (B):

Course	Assessment Tools	Marks	Time (hrs.)
Theory / * Computer based	Written paper based on the entire syllabus.	60	2
	* Computer-based assessment in the college premises.		
Oral	Questions based on the entire syllabus.	25	As applicable
Practical	Performance of the practical assigned during the Examination and the output / results obtained.	25	2
Oral & Practical	Project based courses - Performance of the practical assigned during the examination and the output / results obtained. Based on the practical performed during the Examination and on the entire syllabus.	As per the scheme	2

Prepared by Checked by HoD Vice Principal Principal

Program: Artificial Intelligence and Machine Learning	B.Tech.	Semester: VII/VIII
Course: Responsible AI (DJS23ACPE811)		

Prerequisite: Knowledge of AI

Course Objectives:

1. Introduce the ethical, social, and legal dimensions of AI development and deployment across various domains.
2. Explore frameworks and methodologies for building fair, accountable, and transparent AI systems.
3. Provide hands-on experience with tools for bias detection, privacy preservation, and responsible AI evaluation.
4. Integrate responsible AI principles into the complete lifecycle of designing and deploying real-world AI applications.

Course Outcomes:

1. Understand the core principles of AI ethics, including fairness, accountability, transparency, and privacy, and apply relevant governance frameworks.
2. Apply bias detection and mitigation techniques using tools like AI Fairness 360, Fair learn, and SHAP to build equitable AI models.
3. Apply privacy-preserving AI systems using differential privacy, federated learning, and data anonymization techniques.
4. Integrate ethical governance frameworks and explainability methods into AI development pipelines for responsible, trustworthy, and accountable AI deployment.

Responsible AI (DJS23ACPE811)		
Unit	**Description**	**Duration**
1	**Foundations of AI Ethics** History and evolution of AI ethics, Why ethics matters in AI: societal impact, economic implications, and human rights, Core principles: Fairness, Accountability, Transparency, Privacy, Non-maleficence, Beneficence, Autonomy, Ethical frameworks: Utilitarianism, Deontology, Virtue ethics applied to AI, AI ethics global frameworks: UNESCO Recommendation on AI Ethics, IEEE Ethically Aligned Design, EU AI Act principles, Stakeholder perspectives: developers, policymakers, users, and affected communities,	7
2	**Fairness, Bias, and Accountability in AI:** Types of bias: data bias, algorithmic bias, historical bias, representation bias, measurement bias, Fairness definitions and metrics: demographic parity, equalized odds, individual fairness, counterfactual fairness, Bias detection tools: IBM AI Fairness 360, Bias mitigation strategies: pre-processing (resampling, reweighting), in-processing (adversarial debiasing), post-processing (calibrated equalized odds), Accountability mechanisms: algorithmic auditing, AI impact assessments, human-in-	7

	the-loop (HITL) systems, Responsibility frameworks: legal liability, corporate accountability, third-party auditing.	
3	**Privacy, Data Ethics, and Security in AI** Privacy principles in AI: data minimization, purpose limitation, consent, data sovereignty, Data protection regulations: GDPR, Privacy-preserving ML techniques: differential privacy, federated learning, secure multi-party computation, homomorphic encryption Ethical data collection, annotation, and labeling practices, Adversarial threats to AI: data poisoning, model inversion attacks, membership inference attacks, adversarial examples, Defenses: adversarial training, input validation, model robustness evaluation, Tools: TensorFlow Privacy, PySyft, OpenDP, Anonymization libraries	7
4	**Transparency, Explainability, and Trustworthy AI** The transparency imperative: black-box vs. interpretable vs. explainable models, Post-hoc explainability techniques: Attention visualization, Counterfactual explanations, Intrinsically interpretable models: decision trees, rule-based systems, linear models, Explainability for Large Language Models (LLMs): chain-of-thought reasoning, saliency maps, probing, Model Cards and Datasheets for Datasets: documenting AI systems for transparency, Building user trust through interface design, explanation presentation, and appropriate AI communication	8
5	**AI Governance, Policy, and Regulation** Global AI governance landscape: EU AI Act (risk-based classification: unacceptable, high-risk, limited-risk, minimal-risk), US AI Executive Order and NIST AI Risk Management Framework, China's AI governance regulations, India's National AI Strategy, Risk management in AI: risk identification, mitigation, and monitoring, , AI auditing and certification processes, Red-teaming and adversarial testing for AI systems, Corporate AI ethics boards, governance structures, and Chief AI Ethics Officers, Standards: IEEE standards for ethically aligned design, AI procurement and vendor assessment guidelines.	8
6	**Responsible AI in Practice and Future Directions** End-to-end responsible AI development lifecycle: design, data, model, deployment, monitoring, Responsible AI in critical sectors: healthcare , finance, criminal justice (recidivism prediction), education, Generative AI ethics: deepfakes, synthetic media, copyright and intellectual property, non-consensual imagery, misinformation, Agentic AI ethics: autonomous decision-making, corrigibility, value alignment, AI moral agency, AI safety research: alignment problem, reward hacking, instrumental convergence, existential risk,, Future trends: AI rights and personhood, emotional AI ethics, open-source vs. proprietary AI ethics	6
	TOTAL	42

Books Recommended:

Textbooks:

1. Virginia Dignum, "Responsible Artificial Intelligence: How to Develop and Use AI in a Responsible Way", Springer, 2019.
2. Mark Coeckelbergh, "AI Ethics", MIT Press, 2020.
3. Michael Kearns & Aaron Roth, "The Ethical Algorithm: The Science of Socially Aware Algorithm Design", Oxford University Press, 2019.

Reference Books:

1. Cathy O'Neil, "Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy", Crown Publishers, 2016.
2. Stuart Russell, "Human Compatible: Artificial Intelligence and the Problem of Control", Viking, 2019.

NPTEL Courses:

1. Ethics in Engineering Practice https://onlinecourses.nptel.ac.in/noc22_hs22/preview
2. Responsible AI: Principles and Practice
https://onlinecourses.nptel.ac.in/noc24_cs105/preview
3. Introduction to Machine Learning https://onlinecourses.nptel.ac.in/noc23_cs86/preview
4. Responsible & Safe AI Systems https://onlinecourses.nptel.ac.in/noc24_cs132/preview

Coursera Courses:

1. Responsible and Ethical AI https://www.coursera.org/learn/responsible-and-ethical-ai
2. Responsible Generative AI https://www.coursera.org/specializations/responsible-generative-ai
3. Data Privacy, Ethics, and Responsible AI Specialization
https://www.coursera.org/specializations/data-privacy-ethics-and-responsible-ai
4. Strategic AI Governance Specialization https://www.coursera.org/specializations/strategic-ai-governance

Prepared by Checked by HoD Principal

Program: Artificial Intelligence and Machine Learning	BTech	Semester: VII/VIII
Course: Social Network Analysis (DJS23ACPE812)		

Prerequisite: - Probability and Statistics, Machine Learning

Course Objectives:

1. Develop foundational knowledge of massive networks, including their structure, properties, and real-world applications.
2. Enhance analytical and problem-solving skills to address computational, algorithmic, and modeling challenges associated with large-scale networks.
3. Foster a research-oriented perspective by enabling students to analyze network structure, dynamics, and emerging trends in network science.

Course Outcomes: On completion of the course, the learner will be able to

1. Analyse social networks using visualization techniques and structural measures.
2. Illustrate network growth patterns and ranking methodologies in complex networks.
3. Examine methods for detecting communities, predicting links, and modelling information flow.
4. Apply anomaly detection and representation learning approaches for network analysis.

Social Network Analysis (DJS23ACPE812)		
Unit	**Description**	**Duration**
1.	**Society & Network:** Introduction, Use of social networks, defining a network, types of network (link-centric, node and link centric, local view, temporal view, generalization, real-world network), levels of social network analysis, graph visualization tools. Network Measures: Network basics, node centrality, assortativity, transitivity and reciprocity, similarity, degeneracy. Network Growth Models: Overview of real-world networks and their properties, brief introduction to Erdős-Rényi Random Network Model, WattsStrogatz Model, and Preferential Attachment Model with their key characteristics and limitations.	8
2.	**Link Analysis:** Application of link analysis, Signed networks: Balance Theory of Undirected Signed Networks, Status Theory of Signed Networks, Triad Balance vs Status, Strong and Weak Ties: Strength of a Tie, Triadic Closure, Dunbar Number, Local Bridges and Importance of Weak Ties, PageRank, DivRank, SimRank, PathSim.	7
3.	**Community Detection:** Application of community detection, types of communities, community detection methods, Disjoint Community Detection: Node-centric community detection, modularity and community detection, Overlapping Community Detection: Clique Dynamics, Local Community Detection. Link Prediction: Applications of link prediction, Evaluating Link Prediction methods	7
4.	**Cascade Behaviours & Network Effects:**	6

	Preliminaries and Important Terminologies, Cascade Models, Probabilistic Cascades, Epidemic Models, Independent Cascade Models, Cascade Prediction.	
5.	**Anomaly Detection in Networks:** Outliers verses network based anomalies. Anomaly in Static Networks: Plain and attributed networks, relational learning, Anomaly in Dynamic Networks: Preliminaries, feature and decomposition-based approaches, Challenges in anomaly detection.	**6**
6	**Graphical Representation Learning:** Intuition behind representation learning, representation learning methods. Graph Convolutional Network (GCN) and its variations and applications in social network analysis. Dynamic Graph Convolutional Networks (DGCN) & Continuous-Time Dynamic Graph Neural Networks (CTDGNN): Advanced models for analyzing evolving social networks	**8**
	TOTAL	**42**

Books Recommended:

Textbooks:

1. Tanmoy Chakraborty, "Social Network Analysis", First Edition, Wiley, 2021.

2. Stephen P Borgatti, Martin G. Everett, Jeffrey C. Johnson, "Analyzing Social Networks", Sage Publications Ltd, 2nd Edition, 2018.

3. William L. Hamilton, "Graph Representation Learning", Morgan & Claypool Publishers,2020.

Reference Books:

1. Xiaoming Fu, Jar-Der Luo, Margarete Boos, 'Social Network Analysis Interdisciplinary Approaches and Case Studies', 1st Edition, CRC Press, 2020.

2. Dr. Krishna Raj P.M., Mr. Ankith Mohan, Dr. Srinivasa K.G, "Practical Social Network Analysis with Python (Computer Communications and Networks)", First Edition, Springer, 2019.

3. John Scott, "Social Network Analysis", Fourth Edition, SAGE Publications Ltd,2017.

4. Song Yang, Franziska Barbara Keller, LuZheng, "Social Network Analysis: Methods and Examples", First Edition, SAGE Publications, 2016.

Web Link:

A course on Social Network Analysis https://onlinecourses.nptel.ac.in/noc22_cs117/preview

Prepared by Checked by HoD Principal

Program: Artificial Intelligence and Machine Learning	BTech	Semester: VII/VIII
Course: Computational Neuroscience(DJS23ACPE813)		

Prerequisite: - Artificial Intelligence, Machine Learning, Statistics and Programming Skills.

Course Objectives: This course aims to provide students with a strong foundation in the field of Cognitive Neuroscience, a field that studies the intricate links between the mind, the brain, and behaviour. Students will learn methods to replicate human behaviour of how to sense and perceive the world, act in it, learn and think about it, and remember it.

Course Outcomes:

On completion of the course students will be able to:

1. Understand the computational neural structure
2. Illustrate coding and decoding models
3. Describe neural circuit and network models
4. Apply information theory concepts on Brain mapping

Computational Neuroscience(DJS23ACPE813)		
Unit	**Description**	**Duration**
1.	Introduction: Descriptive model, Mechanistic model and Interpretive model, Properties of Neurons, recording neuronal responses, Spike trains and firing rates: Measuring Firing Rates, Tuning curves; Stimulus: The spike Triggered Average, White noise Stimuli, Multiple Spike Triggered Averages and Spike Triggered correlations, Spike-Train Statistics – Homogenous and Inhomogeneous Poisson Process, Auto correction Function, The Poisson Spike Generator, The Neural Code	6
2.	Neural Encoding: Introduction to retina, LGN, V1, area 17, Techniques of neural data collection, Reverse-Correlation Methods: Simple Cells, Spatial Receptive Fields, Temporal Receptive Fields, Response of a simple cell to counterphase grating, Space-time Receptive Fields; Linear Filtering, Non-linear input-output function, Basic encoding model, Impact of PCA on encoding model, Non-linear representation with Gaussian, Binomial and Poisson representation, The generalized linear model.	8
3.	Neural Decoding: Encoding decoding, Discrimination: ROC curves, The likelihood ratio test; Population Decoding: optimal decoding method, Fisher Information; Spike-Train Decoding	8
4.	Information Theory: Entropy and Mutual Information, Information and entropy maximization: for single Neuron, populations of neurons; Utilization	6

	in Retinal Ganglion cell Receptive Fields- Application, Entropy and information for spike trains	
5.	Model Neurons (Neuroelectronic): Significance of Neuroelectronic in neuroscience, Neuronal Biophysics- Membrane potentials, Single compartment models, Integrated and fire models, Voltage dependent conductance, The Hodgkin- Huxley Model, Channel Simulation, Synaptic Transmission Models, Synaptic Inputs to Integrate-and-Fire Models	8
6	Network Models- Introduction - Importance of connectivity and dynamics, Firing-Rate Models - Dynamics of average firing rates, Feedforward - Neural mapping, Recurrent Networks: Linear and Nonlinear Recurrent Networks, Stability and oscillatory dynamics.	6
	TOTAL	**42**

Books Recommended:

Textbooks:

1. José Luis Bermúdez, "Cognitive Science: An Introduction to the Science of the Mind", Cambridge University Press, New York, 2nd Edition, 2014.

2. Jay Friedenberg, Gordon Silverman and Michael J. Spivey, "Cognitive Science: An Introduction to the Study of Mind", SAGE Publication, 4th Edition, 2021.

Reference Books:

1. Michael Gazzaniga, Richard B Ivry, George R Mangun, "Cognitive Neuroscience the Biology of the Mind," W. W. Norton & Company Publication, 5th Edition, 2019.

2. Daniel Kolak, William Hirstein, Peter Mandik, Jonathan Waskan," Cognitive Science: An Introduction to Mind and Brain, Taylor and Francis, 1st Edition, 2006.

Web Link:

https://nptel.ac.in/courses/102105100

Prepared by Checked by HoD Principal

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

POLICY ON

INTERNSHIP

(ON JOB TRAINING [OJT])

CUM PROJECT

Course Code : DJS23IPELX14



TABLE OF CONTENTS

No.	Contents	Pg. No.
	Introduction	2
	Vision	2
	Mission	2
	Objectives	3
1.	Benefits of Internship (OJT) Cum Project	4
	1.1 Benefits to Students	4
	1.2 Benefits to Industry	4
	1.3 Benefits to the Institute	4
2.	Organizational Structure at DJSCE for Internship (OJT) Cum Project	5
	2.1 Role of Convener/Co-ordinator/Mentor	5
	2.1.1 Internship (OJT) Cum Project Convener (OC)	5
	2.1.2 Department Internship (OJT) Cum Project Coordinator (DOC)	6
	2.1.3 Faculty Mentors (FM)	6
	2.1.4 Role of Student	6
3.	Responsibilities of Students Undergoing Internship (OJT) Cum Project	7
4.	Internship (OJT) cum Project Schedule, Types, Duration, Examination, and Academic Credits	9
	4.1 Internship (OJT) Cum Project Scheduling and Implementation Guidelines	9
	4.2 External Internship (OJT) Cum Projects	10
	4.3 Structured Internship (OJT) Cum Project Distribution and Revised Examination Scheme for Final Year Students	10
	4.4 Monitoring and Evaluation of Internship (OJT) Cum Project	11
5.	Mid-Term and Final End Semester Reviews	12
6.	Evaluation by External Supervisor	12
7.	Evaluation by Internal Supervisor	13
8.	Final Internship (OJT) Cum Project and Project Examination	13
9.	End-Semester Oral Examination Evaluation Scheme	14
10.	Feedback Collection	14
11.	Internship (OJT) Cum Project Sources	15
12.	Mapping of Internship (OJT) Cum Project Outcomes with Program Outcomes	16
	Annexures I to XVI	19-42

Introduction

Shri Vile Parle Kelavani Mandal's (SVKM) Dwarkadas J. Sanghvi College of Engineering (DJSCE) has developed an internship policy On Job Training (OJT), based on the guidelines of National Education Policy (NEP-2020) and as per the state Government of Maharashtra's regulations & guidelines and directives of the All India Council for Technical Education (AICTE). DJSCE's internship policy aims to provide students with an exposure to experiential learning and to inculcate professionalism among its students through systematic industry interactions and assimilation of practical real-world experiences.

In a short span of 32 years, DJSCE established in 1994, has made its impact felt not only in the country, but also abroad. DJSCE is an Empowered Autonomous Institution granted autonomy by the University Grants Commission (UGC) and University of Mumbai for a period of 10 years starting from the A.Y. 2019-20 to 2028-29. The college has always been able to attract good quality faculty members, good quality students and various reputed recruiters, year after year, since its inception.

DJSCE's On Internship (OJT) Cum Project policy, henceforth addressed as "The DJS-OJT policy", aims to develop a sustainable ecosystem that is beneficial to all stakeholders. The objective is to facilitate well-organized communication amongst its students, industry and the institute.

In addition, under the Internship (OJT) Cum Project program, students will undertake a project, based on the technologies and tools they learn during their industry training. Having got such an exposure, the students are expected to demonstrate their ability to apply acquired knowledge to practical problem solving and the same will be assessed and graded.

Vision

To ensure exposure to budding engineers on experiential learning and thereby build a career development ecosystem for inculcating professional values and skills for sustainable progress and development of society.

Mission

1. To provide a platform for practical exposure to students and nurture professionalism in them.

2. To foster technical competence, research aptitude and awareness about professional/industrial environment amongst aspiring technocrats, helping them develop sustainable engineering solutions.
3. To identify and substantiate the efforts of budding engineers, helping enhance their professional/industrial outlook and overall development.

Objectives

Internship (OJT) Cum Projects help build a base for educational and career development opportunities, providing practical experience to students in a specific field or discipline. They are well-designed, short to medium term, supervised placements, often focused on particular tasks or projects with defined time-scales.

Following are the intended objectives of Internship (OJT) Cum Project:

1. Expose students to an industrial environment, which is challenging and hence create competent professionals for the future needs of industry.
2. Provide possible opportunities to learn, understand, and sharpen real-time technical/managerial skills required at the job.
3. Ensure exposure to the current technological developments relevant to the subject area of training.
4. Help students use the industrial learnings in their further classroom discussions, if applicable.
5. Create conditions conducive to the quest for knowledge and its applicability in the field.
6. Help students learn to apply the technical knowledge in real-time situations.
7. Help gain experience in writing technical reports/projects.
8. Help expose students to various responsibilities and ensure ethical standards.
9. Familiarize students with various materials, processes, products and their applications along with relevant aspects of quality control.
10. Promote academic, professional and personal development of the trainees.
11. Channelize students to future employment opportunities.
12. Help understand social, economic, and administrative considerations that influence the working environment of industrial organizations.

13. Help understand the psychology, habits, attitudes, and approach of sub-ordinates, super-ordinated, and colleagues towards problem solving.
14. Enable students to undertake industry-relevant projects that involve problem identification, analysis, design, and implementation.
15. Encourage students to apply project management principles, teamwork and innovation, while executing and presenting project outcomes aligned with organizational goals.
16. Help build entrepreneurial spirits amongst students and work towards strengthening the Start-up ecosystem in the country.
17. To ensure that the trainees are focused on building sustainable solutions, being aware of and keeping the UN's SDGS in their professional committements.

1. Benefits of Internship (OJT) Cum Project

1.1 Benefits to Students

1. Practical exposure and real-time experience in an organizational setting.
2. Platform to apply the knowledge gained in the college to the real-world scenario with the guidance of professionals, who have experience and expertise in handling such practical scenarios.
3. Opportunity to learn and enhance additional skills and expand knowledge.
4. Opportunity to develop one's personality by improving communication skills, teamwork, time management and multitasking, etc. in a professional/industrial setup.
5. Opportunity to get hired by high-quality industry/organizations.
6. Opportunity to evaluate the organization and thus get channelized to appropriate industry and the profession itself.
7. Opportunity to create and sustain professional and social groups of special/similar interests.
8. Potential for valuable addition to their resume for employment and higher education opportunities.

1.2 Benefits to Industry

1. Trainee's availability for temporary or seasonal positions and projects, which may further lead to evaluated resources for employment.
2. Trainees bring in a new perspective to problem solving.

3. Enhanced visibility of the organization on various academic campuses.
4. Freedom and time availability for industrial staff to pursue more creative projects.
5. Availability of cost-effective resource, not requiring a long-term employer commitment.
6. Enhancement of employer's image in the community by contributing to the educational enterprise and nation building (CSR).

1.3 Benefits to the Institute

1. Helps and builds good and sustainable industry-institution interaction and future relationship.
2. Contribute to upskilling the students and making the placement process further easier, as applicable.
3. Improves institutional credibility and branding in the society.
4. By ensuring practical exposure to students as well as faculty members, the quality of Technical Education in the institution goes up.
5. Curriculum revision as and when required can be made based on the feedback from industry and students.
6. Helps to further improve the teaching-learning process.
7. Creates a sustainable knowledge eco-system, in its totality.

2. Organizational Structure at DJSCE for Internship (OJT) Cum Project

The structure of the Internship (OJT) Cum Project program is organized in a hierarchical manner, consisting of the Internship (OJT) Cum Project Convener, Department Internship (OJT) Cum Project Coordinator (DOC), and Faculty Mentors (FMs), who collectively guide and support students.

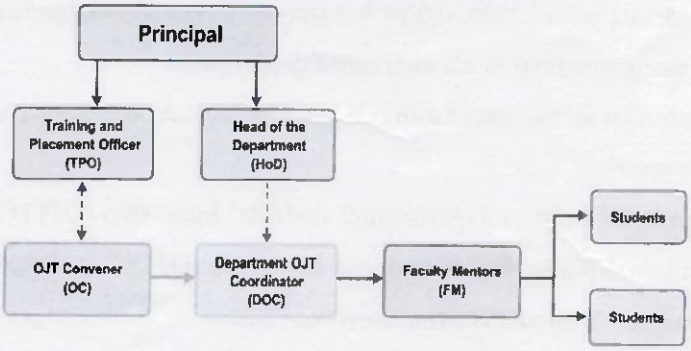


Fig. 1: Internship (OJT) Cum Project Hierarchy Structure

2.1 Role of Convener/Co-ordinator/Mentor

2.1.1 Internship (OJT) Cum Project Convener (OC)

1. Works in close liaison with industries/corporates of repute and, in coordination with TPO and DOC, identifies and facilitates Internship (OJT) Cum Project opportunities across start-ups, government organizations, NGOs, and industries.
2. Informs and guides various departments as well as students regarding available Internship (OJT) Cum Project opportunities.
3. Facilitates campus, off-campus, and online recruitment processes for internships and trainee positions.
4. Organizes webinars, technical talks, and soft skills development sessions using institutional and external expertise.
5. Coordinates with DOC to maintain comprehensive Internship (OJT) Cum Project records and statistics at both departmental and college levels.
6. Collects feedback from and interacts with various companies to enhance the effectiveness of the Internship (OJT) Cum Project program.
7. Monitors Internship (OJT) Cum Project progress and handles issues related to Internship (OJT) Cum Project completion.
8. Issues Bonafide Certificates to students, as required for submission to companies.
9. Ensures the smooth functioning of the Internship (OJT) Cum Project Cell.

2.1.2 Department Internship (OJT) Cum Project Coordinator (DOC)

1. Identify various Internship (OJT) Cum Project opportunities by self and/or in accordance with TPO/OC/DJSCE Alumni.
2. Coordinate with TPO/OC/FM for smooth execution of Internship (OJT) Cum Project - related assignments of one's concerned department.
3. Ensure that all the Internship (OJT) Cum Project opportunity details are shared with the students on time.
4. Record and monitor departmental students' Internship (OJT) Cum Project progress.
5. Maintain departmental statistics of Internship (OJT) Cum Project programs.
6. Issue NOC to students (*Annexure I*).
7. Issue Internship (OJT) Cum Project Completion Certificate (*Annexure XVI*).

2.1.3 Faculty Mentors (FMs)

1. Track and monitor students' Internship (OJT) Cum Project progress.
2. Help students in resolving issues, if any, relating to Internship (OJT) Cum Project.
3. Work in close coordination with the DOC mentees and ensure timely submission of any Internship (OJT) Cum Project -related documents of students.
4. Conduct visits to Internship (OJT) Cum Project locations to monitor students' progress, obtain feedback, and evaluate their performance.
5. Evaluate students regularly and fill the internal review rubrics (*Annexure VII(a)*)
6. Coordinate with external supervisor to fill overall Internship (OJT) Cum Project Evaluation (*Annexure VIII*), evaluation filled by external supervisor (*Annexure IX*) & external supervisor feedback form (*Annexure XII*).
7. Fill internal supervisor feedback form (*Annexure XIII*).

2.1.4 Role of Students

1. To submit the required data, as and when asked by the DOC/Mentor, on time.
2. To intimate the faculty as well as company mentors about the Internship (OJT) Cum Project in a timely fashion.
3. To demonstrate and explain the Internship (OJT) Cum Project work/task to the evaluation committee.
4. To submit Internship (OJT) Cum Project Completion Certificate to DOC/FM.
5. To submit Resume as and when asked only, in PDF format with the file name as *Student Name_Roll No_Year of Study_Semester_Branch_Division.pdf*.

   e.g., Chaitanya_Roll No_Year_B.Tech.7_AI-DS_A1.pdf
6. To submit Undertaking for opting Internship (OJT) Cum Project (*Annexure II*), Internship (OJT) Cum Project joining form (*Annexure III*), Parent undertaking form (*Annexure IV*), Contact details, objectives and learning activities of Internship (OJT) Cum Project (*Annexure V*) to faculty mentor.
7. During Internship (OJT) Cum Project, regularly fill the logbook (*Annexure VI*)
8. At the end of Internship (OJT) Cum Project, fill the student feedback form (*Annexure XIV*) and SDG mapping form (*Annexure XV*)

3. Responsibilities of Students Undergoing Internship (OJT) Cum Project

1. ***Acceptance of Internship (OJT) Cum Project Opportunities from the College***

   Students are required to carefully review every Internship (OJT) Cum Project opportunity provided through the college, including the job description, company details, location, working hours, stipend (*if applicable*), and all other conditions. If the opportunity is feasible and suitable to the student's circumstances, then only they should apply for the same. Once the selection process is complete **and the student is offered an Internship (OJT) Cum Project position by the company, the student is strictly required to accept the offer and continue the Internship (OJT) Cum Project without any refusal, withdrawal, or request for change.** Rejection or switching of allotted Internship (OJT) Cum Project opportunities will **not be permitted under any circumstances.**

2. ***Punctuality and Attendance***

   Students must maintain consistent and disciplined attendance at their assigned workplace. They are expected to report on time daily, complete all required Internship (OJT) Cum Project hours, and promptly inform both their supervisor and FM of any unavoidable absence, supported by valid documents and proper justification.

3. ***Professional Conduct***

   Students shall display exemplary professionalism at all times. This includes adhering to workplace norms, maintaining proper dress code, showing respect to all employees, and upholding the highest standards of ethics and behavior.

4. ***Active Learning and Adaptability***

   Students are expected to undertake Internship (OJT) Cum Project with commitment, enthusiasm, and a genuine willingness to learn. They must adapt to the industry's culture, actively participate in all assigned tasks, and remain receptive to feedback and new experiences.

5. ***Following Instructions and Taking Accountability***

   Students must strictly follow instructions given by supervisors and faculty mentors. They should complete all assigned tasks accurately, responsibly and within deadlines. Students are

fully accountable for the quality of their work, behaviour and compliance with industry expectations.

6. ***Effective Communication***

Students must communicate clearly, politely, and professionally with supervisors, mentors, and colleagues. They should seek clarification when required, give timely updates on progress, and immediately report any concerns or difficulties they may have faced.

7. ***Teamwork and Collaboration***

Students are expected to work cooperatively within teams, contribute positively to group activities, respect diverse viewpoints, and support peers to achieve shared objectives.

8. ***Confidentiality and Integrity***

Students must strictly maintain confidentiality of all organizational information that they are exposed to during their Internship (OJT) Cum Project. They must use company resources responsibly and uphold honesty, transparency and integrity in every task and interaction.

9. ***Safety and Compliance***

Students must follow all workplace safety guidelines and industrial policies without exception. Any unsafe practices, hazards, or incidents must be reported immediately to the supervisor.

10. ***Documentation and Reporting***

Students are required to maintain a detailed daily log or diary of their tasks, observations, and learning outcomes. Weekly progress reports must be submitted on time, along with a comprehensive final Internship (OJT) Cum Project report as mandated for evaluation.

11. ***Initiative and Contribution***

Students are encouraged to demonstrate proper initiative, propose constructive improvements, and apply creativity and problem-solving skills, wherever appropriate within their assigned roles.

12. ***Reflective Practice***

Students must regularly evaluate their experiences, identify strengths & improvement areas, and apply their learnings to enhance their professional growth and future career preparedness.

4. Internship (OJT) cum Project Schedule, Types, Duration, Examination and Academic Credits

The following framework is followed to ensure the award of academic credit for the Internship (OJT) Cum Project undertaken as part of the program:

- *18 credits of OJT + Project work will be counted towards completion of B.Tech. Degree program.*

Here, 1 credit is equivalent to 40 hours of work. This will result in about minimum 550-600 hours of total Internship (OJT) Cum Project duration spread over a semester of Final Year B. Tech program.

4.1 Internship (OJT) Cum Project Scheduling and Implementation Guidelines

- The **full-time Internship (OJT) Cum Project** program shall be conducted **exclusively during the designated semester** as per the academic schedule. The duration of the Internship (OJT) Cum Project shall be **one semester (either VIIth or VIIIth) in the final year**.
- Each **faculty member** supervising Internship (OJT) Cum Project will be assigned an **Internship (OJT) Cum Project workload of two hours per week** for mentoring, monitoring progress, and evaluating student performance.
- The **Internship (OJT) Cum Project program** will be **implemented for final-year students**, specifically during the **seventh or eighth semester**, depending on the respective program structure and institutional guidelines.
- Approximately 50% of the students of a particular program will go for the Internship (OJT) Cum Project during the semester 7 and the semester 8.

4.2 External Internship (OJT) Cum Projects

- Industry Internship (OJT) Cum Project with/without stipend.
- Government/PSU (BARC/SAMEER/Railway/ISRO, etc.) Internship (OJT) Cum Project.
- Research Internship (OJT) Cum Project approved by the institute (IITs/NITs/IISc/IIMs, etc.).
- Start-up having more than 5 employees other than Founder/Co-founders (to be finalised and certified by the college dept. committee).
- Internship (OJT) Cum Project with other institutes approved by DJSCE and respective departments.
- Any other Internship (OJT) Cum Project approved by the concerned authorities of the college, mentioning equivalence in the work and relevance to the field of study/domain of work.

4.3 Structured Internship (OJT) Cum Project Distribution and Revised Examination Scheme for Final Year Students

From each branch, **approximately 50% of the students (as per the discretion of the dept) will undergo Internship (OJT) Cum Project during the 7th semester**, while the remaining 50% will continue with regular lectures and practical sessions in the institute. In the **8th semester, this arrangement will be swapped**, ensuring that both groups receive equal academic and industry exposure, so as to complete their mandatory credits.

This structured distribution has been considered beneficial for multiple reasons:

- It ensures a **continuous supply of students to industries throughout the year,** strengthening the industry–institute collaboration and interaction.
- It enhances **placement opportunities,** as placing half the batch at a time is more manageable (from a quality oriented perspective) as compared to placing the entire batch simultaneously.
- It enables optimal **faculty workload management** as academic activities will continue smoothly for the batch present in the college.

Internship (OJT) Cum Project is planned as a six-month commitment and the evaluations, covering Oral and Practical are done at the end of the semester. However, Written Examinations immediately after the 7th semester (for those students, who are pursuing subjects in the college) will be conducted at the end of the 8th semester, i.e., at the end of the academic year. This is because, otherwise it would require generating separate question papers for the same subject and the same class, which is not a correct evaluation technique, as students of the same class would be writing different papers for the same subject. Students will be issued a combined marksheet for Semester 7 and Semester 8.

4.4 Monitoring and Evaluation of Internship (OJT) Cum Project

Different Internship (OJT) Cum Project Evaluation criteria are as follows:

1. Skill set (*Technical, Communication, Organizational, and Writing Skills*)
2. Eagerness to learn.
3. Attendance and Punctuality.
4. Professional Attitude
5. Quality of work done.
6. Application of Technical knowledge and Expertise.
7. Submission of the report

Based on the above criteria, Internship (OJT) Cum Projects will be evaluated. Figure 2 shows the flow of Internship (OJT) Cum Project evaluation process. The External Internship (OJT) Cum Project will be evaluated by the industry supervisor and Concerned Staff/Faculty mentors.

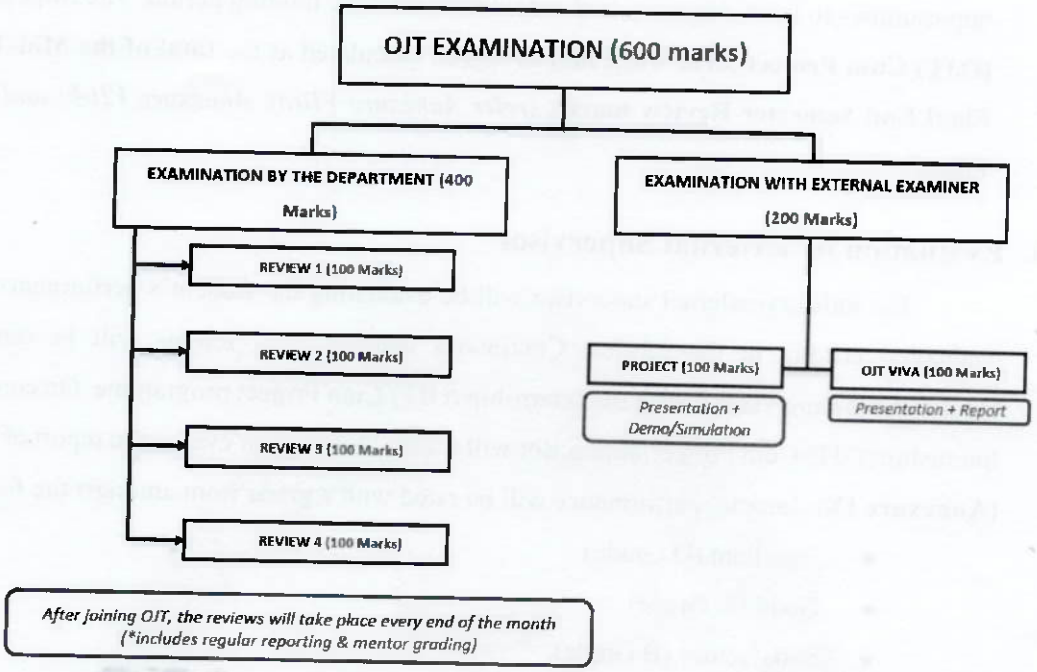


Fig. 2: Internship (OJT) Cum Project Evaluation Process

5. Mid-Term and Final End Semester Reviews

The **Internship (OJT) Cum Project monitoring and evaluation process** consists of four key review stages designed to assess student progress and overall performance:

- **Mid-Term Reviews**

Conducted jointly by the *industry mentor*, *faculty coordinator* and *a departmental panel* consisting of at least two faculty members, other than the guide, appointed by the Head of Department. This review focuses on providing constructive feedback, identifying areas for improvement, and ensuring that students are progressing effectively towards their learning objectives as part of a continuous assessment process {*refer Annexure VII(a) and Annexure VII(b)*}.

- **Final End Semester Review**

Conducted at the end of the internship period, the final review evaluates the student's overall performance. Assessment parameters include **logbook records (Annexure VI), weekly progress reports, presentations**, and **feedback from the industry mentor (Annexure XII)**. These reviews ensure a fair, transparent, and balanced evaluation process, while giving students

opportunities to learn, improve, and excel throughout the training period. The **final Internship (OJT) Cum Project term work marks** will be calculated as the **total of the Mid-Term and Final End Semester Review marks** {*refer Annexure VII(a), Annexure VII(b) and Annexure VII(c)*}.

6. Evaluation by External Supervisor

The industry/external supervisor will be evaluating the student's performance based on evaluation criteria in the rubrics. Continuous evaluation of interns will be done by the faculty/guide supervisor during the Internship (OJT) Cum Project programme. On completion of Internship (OJT) Cum Project, supervisor will fill the "Supervisor evaluation report of the intern" **(Annexure IX)**. Interns' performance will be rated with a grade from amongst the following:

- Excellent (O Grade)
- Good (A Grade)
- Satisfactory (B Grade)
- Not Satisfactory (C Grade)

7. Evaluation by Internal Supervisor

Faculty mentors/guides will evaluate students undergoing Internship (OJT) Cum Project programmes as a continuous evaluation process. The faculty mentor/guide may visit the Internship (OJT) Cum Project site on an unannounced basis to assess the student's performance and presence. If a student is found absent without prior intimation, appropriate action will be taken by the college. In case of repeated instances, the student's Internship (OJT) Cum Project will not be recognized by the college.

Students undergoing internal Internship (OJT) Cum Project via Inter/Intra Institutional Activities will be evaluated by Concerned Faculty mentors/guides based on criteria specified in the rubrics **(Annexure VIII)**. After completion of Internship (OJT) Cum Project, Faculty mentors/Department Staff will assess the college evaluation report and rate the student's overall performance as Excellent, Good, Satisfactory or Not-Satisfactory. Based on External supervisor report, internal supervisor will take the decision.

8. End Semester Examination: Internship (OJT) Cum Project cum Project

After completion of Internship (OJT) Cum Project, a student will present his/her Internship (OJT) Cum Project and project activities to an external examiner. The evaluation criteria for seminar presentation/viva will be as given below:

1. Quality of content presented
2. Proper planning for presentation
3. Effectiveness of presentation
4. Depth of knowledge and skills
5. Attendance record, log book, review reports shall also be analyzed along with the Internship (OJT) Cum Project report. The format for the Internship (OJT) Cum Project report is to be finalized by the respective department.

Seminar presentation will enable sharing of knowledge and experience amongst students and teachers, and build communication skills and confidence in students. Internal and external examiner will evaluate the student based on the rubrics and guidelines given in *Annexure X, Annexure XI(a) & Annexure XI(b).* After successfully submitting an Internship (OJT) Cum Project work report and seminar presentation, students will be eligible to get an Internship (OJT) Cum Project Completion Certificate **(Annexure XVI)** from college or department.

9. End-Semester Oral Examination Evaluation Scheme

1. Upon successful completion of the **Project and On-the-Job Training (OJT)**, an **Oral Examination and presentation (Viva-Voce)** will be conducted. The evaluation will be carried out jointly by a **panel comprising the Departmental Guide and Interdepartmental/External Examiners**, under the guidance of the concerned **Head of Department (HOD)**.
2. The **OJT + Project** carries a **total of 18 credits (600 marks)**, distributed as follows:
    - ***Internship (OJT) Cum Project Internal Review:*** 400 marks *(100 marks for three Mid-Term Reviews and 100 marks for Final End-Semester Review)*
    - ***Internship (OJT) Cum Project End-Semester Oral Examination (Evaluated by External Examiner):*** 100 marks
    - ***Project Report and Presentation (Evaluated by External Examiner):*** 100 marks

10. Feedback Collection

Feedback plays a vital role in the continuous improvement of the Internship (OJT) Cum Project experience. It is collected from multiple stakeholders to provide a holistic evaluation of student performance and program effectiveness:

- **Student Feedback (Annexure XIV)**
  Students reflect on their learning experiences, challenges faced, and key takeaways from the Internship (OJT) Cum Project. They are also required to fill the mapping of Internship (OJT) Cum Project with sustainable development goals (SDGs) **(Annexure XV)**.
- **External Supervisor Feedback (Annexure XII)**
  Supervisors assess the student's technical skills, work ethic, professional behavior, and contribution to organizational tasks.
- **Internal Supervisor Feedback (Annexure XIII)**
  Faculty members share academic and professional insights based on monitoring visits, logbook assessments, and interactions with the student and mentor.

This multi-level feedback mechanism ensures that the evaluation incorporates academic, professional, and personal growth perspectives, fostering a comprehensive understanding of the student's development.

11. Internship (OJT) Cum Project Sources

In order to facilitate Internship (OJT) Cum Project for students, AICTE has signed many MoUs with Industries, Training institutions, Govt. Bodies, which are available on the AICTE's website www.aicte-india.org. Table I shows the list of available sources, which students can refer to get an Internship (OJT) Cum Project / Internships opportunity.

Table I: Web References to INTERNSHIP (OJT) CUM PROJECT/Internships Sources by AICTE

Sr. No.	Memorandum of Understanding	For more details, please visit
1.	AICTE's MoU with Internshala	https://www.aicte-india.org/downloads/letter_technical_inst_mou_internshala.pdf
2.	MoU with NETiit for internships in Taiwan	https://www.aicte-india.org/downloads/mou_netiit.pdf

3.	AICTE's MoU with HireMee	https://www.aicte-india.org/downloads/aicte_mou_HireMee12_9_17.PDF
4.	AICTE's MoU with Indira Gandhi National Centre for the Arts (IGNCA)	https://www.aicte-india.org/.../AICTE%20_IGNCA_MoU.pdf
5.	AICTE's MoU with Center for Creative Economy and Innovation (CCEI), Daegu, Republic of Korea.	https://www.aicte-india.org/.../AICTE-CCEI%20Daegu_MoU%20Document_Final.pdf
6.	AICTE's MoU with International Institute of Waste Management (IIWM), Bangalore	https://www.aicte-india.org/sites/default/files/AICTE-IIWM%20MoU.compressed.pdf
7.	AICTE's MoU with Engineering Council of India [ECI]	https://www.aicte-india.org/downloads/eci.pdf
8.	AICTE's MoU with Fourth Ambit	https://www.aicte-india.org/sites/default/files/Fourth%20Ambit.PDF
9.	AICTE's MoU with LinkedIn	https://www.aicte-india.org/downloads/LinkedIn%20MoU.PDF
10.	AICTE's MoU with Telecom Sector Skill Council (TSSC)	https://www.aicte-india.org/downloads/mou_aicte_tssc_22_6_17.pdf
11.	AICTE's MoU with SCHOLARSMERIT	https://www.aicte-india.org/sites/default/files/Scholarsmerit.PDF
12.	AICTE's MoU with Studenting Era to facilitate AICTE approved academic institutions with services for their students & academic faculty	https://www.aicte-india.org/sites/default/files/Studenting%20Era.PDF
13.	AICTE's MoU with Ministry of Micro, Small and Medium Enterprises (MSME)	https://www.aicte-india.org/sites/default/files/Signed_MoU_with_AICTE.compressed.pdf

Along with above Internship (OJT) Cum Project /Internships sources, students can also approach Board of Apprenticeship Training (BOAT) and Board of Practical Training (BOPT).

12. Mapping of Internship (OJT) Cum Project Outcomes with Program Outcomes

Table II: Mapping of Internship (OJT) Cum Project Outcomes with Program Outcomes

Sr. No.	Graduate Attributes from NBA	Activities proposed	Outcome
1.	**Engineering knowledge:** Apply the knowledge of mathematics, science, Engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.	Application of engineering knowledge to attempt real-world problems through internship/ Project/ Internship (OJT) Cum Project.	An ability to apply knowledge in application of engineering techniques, tools and resources on the project.
2.	**Problem analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching a substantiated conclusion using first principles of mathematics, natural sciences and engineering sciences.	Working for in-house and Out-house Consultancy/Research projects.	Educating students to gain practical insights of research and consultancy projects. Students will also develop an ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.
3.	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and cultural, societal, and environmental considerations.	Active participation in various Idea competitions and innovative product development events such as Hackathons at various levels.	An ability to design solutions for modern engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, economic, environmental, cultural and societal aspects.
4.	**Conduct investigations of complex problems.**	Internship at national/International Level. Enhanced learning experience through MOOC courses such as Coursera, NPTEL, and IBM, etc.	Enhancement of competitiveness and employability of students across the globe.
5.	**Modern tool usage:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling of complex engineering activities, with an understanding of the limitations.	Exposure to advanced tools and technologies.	Ability of students to use modern tools and processes to solve real-world engineering problems.
6.	**The engineer and society:** Apply reasoning informed by the contextual	Working towards societal upliftment through rural	Students will realize their social responsibilities and

	knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	internship, NGOs, NSS, Government and PSUs.	apply their engineering knowledge to address various societal, health, safety, legal and cultural issues.
7.	**Environment and sustainability:** Understand the impact of the professional engineering solution in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.	Promoting activities aiming towards sustainable development and creating an eco-friendly environment.	Students will understand the need of developing a sustainable and environment friendly solution.
8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Inclusion of various ethical principles such as honesty, punctuality and integrity to evaluate interns.	Creating future ready engineers acquainted with professional ethics and accountability.
9.	**Individuals and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.	Inculcation of team work and leadership qualities through organizing various activities such as conferences/ Hackathons /workshops at department and college level.	Ability to work in team at various positions in multi-disciplinary environment.
10.	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.	Conduction of various activities aiming towards development of Personality, communication skills, report writing and presentation skills.	Development of effective communication and presentation skills.
11.	**Project management, finance, and life-long learning:** Students will apply engineering, management, and financial principles to effectively manage projects as team members or leaders in multidisciplinary environments. They will gain practical exposure to project and finance management during the curriculum and recognize the importance of continuous learning to keep pace with technological advancements, ensuring sustained professional growth and excellence.	Gaining practical exposure to manage project and finance during different stages of curriculum.	Ability to excel in this competitive and cutting edge environment owing to his competencies.

Program: Artificial Intelligence and Machine Learning	B.Tech	Semester: VIII
Course: AI in Web3 (DJS23ACSC801)		

Pre-requisites:

Basic Programming (Python/JavaScript), Fundamentals of AI, Data Structures and Algorithms, Computer Networks, Basic Cryptography

Objectives:

1. Understand the fundamentals of Blockchain, Web3, and Artificial Intelligence.
2. Explore decentralized applications (DApps) and smart contract development.
3. Apply Generative AI to blockchain-based applications and decentralized ecosystems.
4. Develop AI-enabled Web3 solutions using blockchain platforms and decentralized technologies.
5. Understand security, privacy, ethical, and governance aspects of AI-powered Web3 systems.

Outcomes: On completion of the course, the learner will be able to:

1. Explain the concepts of Blockchain, Web3, and decentralized applications.
2. Design and analyze blockchain-based decentralized applications using smart contracts.
3. Apply Generative AI techniques for blockchain development and intelligent decentralized services.
4. Evaluate AI-enabled blockchain solutions considering scalability, privacy, and security.
5. Demonstrate responsible and ethical implementation of AI in decentralized Web3 ecosystems.

AI for Cybersecurity (DJS23ACSC801)		
Unit	**Description**	**Duration**
1	**Introduction to Blockchain, Web3 and AI:** Evolution of Web1/Web2/Web3, blockchain fundamentals, DLT, consensus, smart contracts, decentralization, AI in Web3.	5
2	**Decentralized Applications:** DApp architecture, Ethereum, wallets, tokens, Solidity, IPFS, Web3 frameworks, deployment and applications.	5
3	**Generative AI and Blockchain:** LLMs, AI-assisted smart contracts, blockchain analytics, DeFi, DAOs, NFTs, prompt engineering.	5
4	**Responsible AI in Web3:** Smart contract security, AI risks, privacy, explainability, governance, ethics, regulations, capstone.	5
	Total	**20**

Online Course:

1. Decentralized Applications (Dapps): https://www.coursera.org/learn/decentralized-apps-on-blockchain
2. Introduction to Blockchain Technologies: https://www.coursera.org/learn/introduction-blockchain-technologies
3. Generative AI and Blockchain: https://www.coursera.org/learn/generative-ai-and-blockchain

Useful Courses:

1. Blockchain Platforms – https://www.coursera.org/learn/blockchain-platforms
2. Blockchains, Tokens, and The Decentralized Future – https://www.coursera.org/learn/blockchains-tokens-decentralized-future

Prepared by Checked by HoD Principal