



Shri Vile Parle Kelavani Mandal's
Dwarkadas J. Sanghvi College of Engineering
(Autonomous College Affiliated to the University of Mumbai)

Proposed Scheme and detailed syllabus

Final Year B.Tech

in

Computer Science and Engineering
(IoT and Cyber Security with Blockchain Technology)
(Semester VIII)

Prepared by:- Board of Studies in Computer Science & Engineering

(IoT and Cyber Security with Blockchain Technology)

With effect from the Academic Year: 2026-2027



Course Structure for Final Year Undergraduate Program in Computer Science and Engineering (IoT and Cyber Security with Block Chain Technology): Semester VIII (Autonomous)

(Academic Year 2026-2027)

Sr. No.	Course Code	Course	Teaching Scheme				Semester End Examination (SEE) - A						Continuous Assessment (CA) - B						Aggregate (A+B)
			Theory (Hrs.)	Practical (Hrs.)	Tutorial (Hrs.)	Credits	Duration (Hrs)	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)	
1	DJS23BCPE811	Quantum Computing	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100
	DJS23BCPE812	Deep Learning																	
	DJS23BCPE813	Cybersecurity with Computational Finance																	
2	DJS23IPELX14	Internship (OJT) cum Project	--	36	--	18	2	--	--	--	200	200	--	--	--	--	400	400	600
3	DJS23BCSC801	Ethical Hacking and AI System Security	1	--	--	1	--	--	--	--	--	--	15	15	10	40	--	40	40
		Total	4	36	--	22	4	60	--	--	200	260	30	30	20	80	400	480	740


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Program: B.Tech in Computer Science and Engineering(IoT and Cybersecurity with Block chain Technology)							Final Year B.Tech		Semester : VIII		
Course : Quantum Computing							Course Code: DJS23BCPE811				
Teaching Scheme (Hours / week)				Evaluation Scheme							
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)				Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Term Test 3	Total	100
				60			15	15	10	40	
				Laboratory Examination			Term Work				
3	--	--	3	Oral	Practical	Oral & Practical	Laborat ory Work	Tutorial / Mini project / presentatio n/ Journal/ Practical	Total Term work	--	
				--	--	--	--	--	--		

Prerequisite:

1. Linear Algebra and Optimization
2. Probability and Statistical Inference
3. Applied Cryptography
4. Network Security

Course Objectives: The objective of the course is

1. Apply fundamental concepts of quantum physics, and quantum mechanics to analyze and interpret quantum computing systems and their behavior
2. To analyze quantum information concepts such as qubits, entanglement, quantum gates, and quantum key distribution protocols.
3. To explore quantum architectures and hardware implementations, including superconducting qubits, quantum circuits, and noise/decoherence challenges.
4. To apply quantum algorithms and error correction techniques for solving computational problems and ensuring reliable quantum computation.

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

1. Apply fundamental concepts of linear algebra, quantum physics, and quantum mechanics to analyze and interpret quantum computing systems and their behavior.
2. Analyze qubits, entanglement, quantum gates, and circuits to interpret quantum information processing.
3. Illustrate quantum architecture by outlining quantum gates, circuits, and hardware implementations
4. Articulate different qubit storage technologies and explores the physical implementation of quantum computers
5. Implement and compare quantum algorithms and evaluate their computational advantages and limitations.
6. Explore major real-world applications of quantum computing across domains

Detailed Syllabus:		
Unit	Description	Duration
1	Fundamentals of Quantum Computing: The Journey to Quantum, Quantum Physics Essentials, Basic Atomic Structure: Hilbert Spaces: Orthogonality, bases and subspaces, Operators, Observables and measurements, Tensor products in Hilbert spaces, Mixed states and density operators, Uncertainty. Fundamental Computer Science for Quantum Computing: Quantum Principles, States and amplitudes, Measurements-the projection approach, Evolution of quantum systems, Compound quantum systems, Quantum theory interpretations	08
2	Quantum Theory: Further with Quantum Mechanics, Bra-Ket Notation, Hamiltonian, Wave Function Collapse, Schrödinger's Equation, Quantum Decoherence, Quantum Electrodynamics, Quantum Chromodynamics, Feynman Diagram Quantum Entanglement Quantum Bits and Registers, Qubits, Two-qubit registers, No-cloning theorem, Quantum Registers, Entanglement of pure states, Substituting entanglement for communication, Quantum Circuits, Quantum gates, Measurement gates, Universality of quantum gates, Arithmetical circuits, Quantum superoperator Circuits.	08
3	Quantum Architecture Quantum Gates, Hadamard Gate, Phase Shift Gates, Pauli Gates, Swap Gates, Fredkin Gate, Toffoli Gates, Controlled Gates, Ising Gates, Gottesman-Knill Theorem, Quantum Circuits, The D-Wave Quantum Architecture, Superconducting qubit (SQUID).	06
4	Quantum Hardware Qubits, Photons, Electron, Ions, NMRQC, Bose-Einstein Condensate Quantum Computing, GaAs Quantum Dots, Addressing Decoherence Supercooling Dealing with Noise, Filtering Noise, Topological Quantum Computing, Basic Braid Theory, Quantum Data Plane, Measurement Plane, Control Processor Plane	08
5	Quantum Algorithms Quantum Parallelism and Simple Algorithms : Deutsch's problem, The Deutsch-Jozsa promise problem, Simon's problems, Shor's Algorithms: Number theory basics , Quantum Fourier Transform, Shor's factorization algorithm, Shor's discrete logarithm algorithm, The hidden subgroup problems. Grover's search algorithm, G-BBHT search algorithm. Minimum-finding algorithm: Generalizations and modifications of search problems, Methodologies to Design Quantum Algorithms, Amplitude amplification-boosting search probabilities, Amplitude amplification Limitations of Quantum Algorithms No quantum speed-up for the parity function, Framework for proving lower bounds, Oracle calls limitation of quantum computing .	08
6	Quantum Computing Applications Applications of Quantum Computing in Cryptography and Cyber Security, Post-Quantum Cryptography, Quantum Key Distribution (QKD), Quantum Machine Learning, Quantum Computing in Drug Discovery and Healthcare, Quantum Search and Recommendation Systems	04
Total		42





Books Recommended:

Text Books:

1. Michele Mosca, Phillip Kaye, Raymond Laflamme, An Introduction to Quantum Computing, 1st Edition, Oxford University Press, ISBN: 9780198570493, 2007
2. Jozef Gruska, Quantum Computing, 1st Edition, McGraw-Hill / International Thomson Publishing, ISBN: 9780077095033, 1999
3. Chris Bernhardt, Quantum Computing for Everyone, 1st Edition, MIT Press paperback edition, 2020
4. Arthur Pittenger, An Introduction to Quantum Computing Algorithms, Progress in Computer Science and Applied Logic, Volume 19, Springer Science+ Business Media, LLC, 2001
5. Parag Lala, Quantum Computing- A beginner's Interoduction, McGraw Hill Education, 2020

Reference Books:

1. Thomas G. Wong, Introduction to Classical and Quantum Computing, 1st Edition, Rooted Grove, ISBN: 9798985593105, 2022
2. Elias F. Combarro and Samuel Gonz  les-Castillo, A Practical Guide to Quantum Computing: Hands-on approach to quantum computing with Qiskit, 1st Edition, 2022
3. Robert S. Sutor, Dancing with Qubits, 2nd Edition, Packt, 2024
4. Jack D. Hidary, Quantum Computing: An Applied Approach, 2nd Edition, Springer, 2021
5. Leslie E. Ballentine, Quantum Mechanics: A Modern Development, 2nd Edition, World Scientific, 2020
6. Ciaran Hughes et al., Quantum Computing for the Quantum Curious, 1st Edition, Springer, 2021

Web resources:

1. IBM Quantum & Qiskit: <https://qiskit.org/> and <https://quantum.ibm.com>
2. Qiskit Textbook: <https://learning.quantum.ibm.com>
3. Quantum Zeitgeist: <https://quantumzeitgeist.com/>
4. GitHub Quantum Resources: <https://github.com/MonitSharma/Learn>
5. QOSF Resources: https://qosf.org/learn_quantum/



Online Courses: NPTEL / Swayam

1. Introduction to Quantum Computing: Quantum Algorithms and Qiskit, By Prof. Prabha Mandayam, Prof. Anupama Ray, Prof. Sheshashayee Raghunathan, IIT Madras, IBM Research, IBM Systems
https://onlinecourses.nptel.ac.in/noc26_cs89/preview
2. Quantum Computation and Quantum Information, By Prof. Chiranjib Mitra, IISER Kolkata
https://onlinecourses.nptel.ac.in/noc26_ph02/preview

Evaluation Scheme:

Semester End Examination (A):

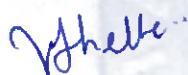
Theory:

1. Question paper will be based on the entire syllabus summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

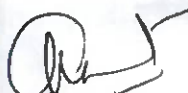
Continuous Assessment (B)

Theory:

1. Term Test 1 (based on 40 % syllabus) of 15 marks for the duration of 45 min.
2. Term Test 2 (on next 40 % syllabus) of 15 marks for the duration of 45 min.
3. Term Test 3 conduction can be Assignment / course project / group discussion / presentation / quiz/ any other for 10 marks.



Prepared by



Checked by



Head of the Department



Vice Principal



Principal



Program: B.Tech in Computer Science and Engineering(IoT and Cybersecurity with Block chain Technology)							Final Year B.Tech		Semester : VIII		
Course : Deep Learning							Course Code: DJS23BCPE812				
Teaching Scheme (Hours / week)				Evaluation Scheme							
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)	
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Term Test 3	Total	100
				60			15	15	10	40	
				Laboratory Examination			Term Work				
3	--	--	3	Oral	Practical	Oral & Practical	Laborat ory Work	Tutorial / Mini project / presentation / Journal/ Practical		Total Term work	--
				--	--	--	--	--		--	

Pre-requisite: Linear Algebra, Calculus, Probability, Statistics and Machine Learning Basics.

Course Objectives: The objective of the course is

1. To introduce fundamental concepts of artificial neural network and different learning algorithms: supervised and unsupervised neural networks.
2. Develop in-depth understanding of the Basic Neural Network Architectures.
3. To expose Deep Network based methods to solve real world complex problems.
4. To explore applications and challenges in deep learning.

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

1. Proficient in the basic principles of the fundamental concepts of neural networks and deep learning.
2. Master the implementation Neural Network Architectures
3. Implement deep network training and design concepts.
4. Build solution using appropriate neural network models.
5. Illustrate performance of deep learning models.
6. Understanding of the fundamental concepts about different types of GANs.



Detailed Syllabus: (unit wise)		
Unit	Description	Duration
1	Introduction to Neural Networks and Deep Learning Fundamentals of Neural Network and Deep Learning, Machine Learning vs Deep Learning, Deep Learning applications, Artificial Neural Network (ANN) : Association of biological neuron with artificial network, activation functions, weights, bias, threshold, learning rate, momentum factor; McCulloch Pitts Neuron: Theory and architecture; linear separability; Hebb Network: Theory and algorithm, ANN architectures. Hyperparameter tuning and batch normalization.	06
2	Supervised Learning Networks: Perceptron, Multilayer Perceptrons (MLPs), Representational power of Perceptron and MLPs, Training rule, Sigmoid neurons, Gradient Descent and DeltaRule, Multilayer Networks: A differentiable threshold Unit, Feedforward Neural Networks, Representation Power of Feedforward Neural Networks; Backpropagation Algorithm: EBPTA, Convergence and local minima, Regularization for Deep Learning: Parameter Norm Penalties, Dataset Augmentation, Noise Robustness, Early Stopping, Sparse Representation, Dropout. Principal Component Analysis and its interpretations, Singular Value Decomposition.	08
3	Convolutional Neural Networks: The Convolution Operation, sparse interactions, parameter sharing, Pooling, Convolution and Pooling as an Infinity Strong Prior, Variants of Basic Convolution Function, Efficient Convolution Algorithms. Convnet architectures: Discussions on famous convnet architectures: AlexNet, VGG, GoogleNet, ResNet InceptionNets, DenseNets.	07
4	Sequence Modelling: Recurrent Neural Networks (RNN), Bidirectional RNNs, Deep recurrent Networks, Recursive Neural Networks, and the challenges of Long-Term Dependencies, Echo State Networks, Leaky Units, and The Long Short-Term Memory.	07
5	Unsupervised Learning Networks: Kohonen Self-Organizing Feature Maps – architecture, training algorithm, Kohonen Self-Organizing Motor Map. Autoencoders: Linear Factor Methods such as Probabilistic PCA and Factor Analysis, Independent Component Analysis, Sparse Coding; Undercomplete Autoencoders, Regularized Autoencoders, Stochastic Encoders and Decoders, Denoising Autoencoders, Contractive Autoencoders, Applications of Autoencoders.	08
6	Generative Adversarial Networks: Generative Vs Discriminative Modelling, Probabilistic Generative Model, Generative Adversarial Networks (GAN), GAN challenges: Oscillation Loss, Mode Collapse, Uninformative Loss, Hyper parameters, Tackling GAN challenges, Wasserstein GAN, Cycle GAN, Neural Style Transfer.	06
	Total	42



Books Recommended:

Text Book

1. Asaton Zhang, Zhacary Lipton, Mu Li and Alex Smola, Dive into Deep Learning ,December 2022.
2. Simon Prince, Understanding Deep Learning, MIT Press, Dec2023.
3. Simon Haykin, "Neural Networks and Learning Machines", Pearson Prentice Hall, 3rd Edition, 2010.
4. S. N. Sivanandam and S. N. Deepa, "Introduction to Soft Computing", Wiley India Publications, 3rd Edition, 2018.
5. David Foster, "Generative Deep Learning", O'Reilly Media, 2019.
6. Denis Rothman, "Hands-On Explainable AI (XAI) with python", Packt, 2020.

Reference Books:

1. Ian Goodfellow and Yoshua Bengio and Aaron Courville, "Deep Learning", An MIT Press, 2016 .
2. François Chollet, "Deep Learning with Python", Manning Publication, 2017.
3. Josh Patterson, Adam Gibson, "Deep Learning: A Practitioner's Approach", O'Reilly Publication, 2017.
4. Andrew W. Trask, Grokking, "Deep Learning", Manning Publication, 2019.
5. John D. Kelleher, "Deep Learning", MIT Press Essential Knowledge series, 2019.

Web resources:

1. <https://www.coursera.org/specializations/deep-learning>.
2. <https://www.deeplearning.ai/courses/deep-learning-specialization/>
3. <https://www.fast.ai/>

Online Courses: NPTEL / Swayam

1. Deep Learning, By Prof. Prabir Kumar Biswas, IIT Kharagpur
https://onlinecourses.nptel.ac.in/noc22_cs22
2. Deep Learning Part 1 (IITM) By Prof. Sudarshan Iyengar & Prof.Mitesh M. Khapra
https://onlinecourses.nptel.ac.in/noc19_cs85



Evaluation Scheme:

Semester End Examination (A):

Theory:

1. Question paper will be based on the entire syllabus summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B)

Theory:

1. Term Test 1 (based on 40 % syllabus) of 15 marks for the duration of 45 min.
2. Term Test 2 (on next 40 % syllabus) of 15 marks for the duration of 45 min.
3. Term Test 3 conduction can be Assignment / course project / group discussion / presentation / quiz/ any other for 10 marks.

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work, and upon fulfilling minimum passing criteria in the term work.

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Head of the Department

Vice Principal

Principal



Program: B.Tech in Computer Science and Engineering(IoT and Cybersecurity with Block chain Technology)							Final Year B.Tech		Semester : VIII		
Course : Cybersecurity in Computational Finance							Course Code: DJS23BCPE813				
Teaching Scheme (Hours / week)				Evaluation Scheme							
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)				Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Term Test 3	Total	100
				60			15	15	10	40	
				Laboratory Examination			Term Work				
3	--	--	3	Oral	Practical	Oral & Practical	Laborat ory Work	Tutorial / Mini project / presentation / Journal/ Practical	Total Term work		
				--	--	--	--	--	--		

Prerequisite:

1. Probability and Statistical Inference
2. Applied Cryptography
3. Network Security

Course Objectives: The objective of the course is

1. To introduce computational finance systems, electronic trading platforms, and digital financial transactions.
2. To develop understanding of quantitative models and computational techniques used in pricing, trading, and portfolio analysis.
3. To analyze cyber threats, risks, and security challenges in banking and financial systems.
4. To explore blockchain, AI, cloud computing, and secure fintech applications in computational finance.

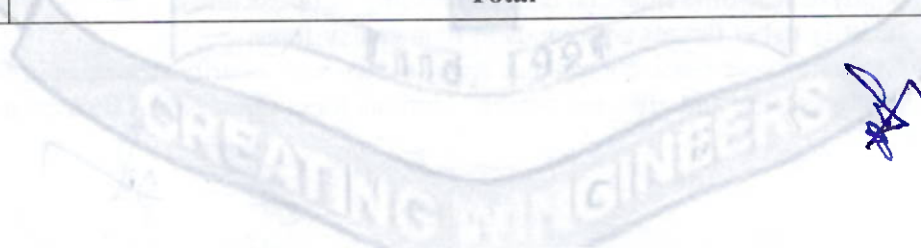
Course Outcomes: On completion of the course, learner will be able to:

1. Explain computational financial systems and electronic trading workflows.
2. Apply quantitative models for pricing and algorithmic trading.
3. Analyze real-time financial data and trading infrastructures.
4. Identify cyber threats and frauds in financial systems.
5. Evaluate cyber risks, compliance frameworks, and security strategies in finance.
6. Design secure and efficient fintech solutions for computational finance applications.



Detailed Syllabus:

Unit	Description	Duration
1	Computational Finance Computational Financial Transactions: Structure of digital financial transactions, Electronic trading systems and computational finance architecture, Transaction lifecycle in financial markets Computational frameworks used in banking, stock exchanges, and fintech systems Financial Data Processing and Market Infrastructure: Financial market data generation and processing , Real-time market data feeds and transaction processing , API-based financial applications and trading platforms	06
2	Computational Models Computational Models for Pricing and Trading: Numerical methods in financial computations, Option pricing models and algorithmic implementation, Computational models for derivatives and structured products, Automated execution systems in computational finance Algorithmic and Quantitative Trading Systems: Fundamentals of algorithmic trading, Quantitative trading strategies and execution models, Market microstructure and order matching systems , Trading latency and performance optimization , Computational challenges in high-frequency trading systems	07
3	Cybersecurity in Financial Systems Overview of cybersecurity in banking and financial markets, cyber threat landscape in computational finance, financial institutions and digital financial ecosystems, cyber-attacks on stock exchanges and payment systems, financial frauds and insider threats, CIA triad in finance, cyber risk management concepts, Introduction to regulatory frameworks in financial cybersecurity.	07
4	Cyber Threats in Trading and Financial Markets Security challenges in algorithmic trading systems, high-frequency trading vulnerabilities, malware and ransomware attacks on financial institutions, phishing and social engineering in banking, market manipulation attacks, denial-of-service attacks on exchanges, cyber-attacks on portfolio management systems, fraud detection techniques using analytics and AI.	07
5	Cyber Risk Assessment and Regulatory Compliance Risk assessment methodologies for financial systems, operational risk and cyber risk modelling, Value at Risk (VaR) and cyber risk correlation, security auditing and compliance, RBI cybersecurity framework, PCI-DSS standards, GDPR and DPDP Act concepts for financial data protection, cloud computing in computational finance, cloud security threats and mitigation, secure APIs for fintech applications.	08
6	Emerging Technologies and Secure Computational Finance Applications Security in fintech ecosystems, blockchain and cryptocurrency security challenges, AI and machine learning in cybersecurity for finance, adversarial attacks in financial AI systems, zero trust architecture for financial institutions, secure portfolio management systems, case studies on real-world cyber incidents in financial organizations.	07
	Total	42





Books Recommended:

Textbooks:

1. Nina Godbole and Sunit Belapure, Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley India, 2021.
2. Charles P. Pfleeger and Shari Lawrence Pfleeger, Security in Computing, Pearson, 6th Edition, 2020.
3. Paul Wilmott, Paul Wilmott on Quantitative Finance, 3 Volume Set, 2013, 2nd edition, Wiley
4. Joerg Kienitz and Daniel Wetterau, Financial Modelling: Theory, Implementation and Practice with MATLAB, 2012, 1st edition, Wiley Finance Series.

Reference Books:

1. Dan Stefanica., A Primer for the Mathematics of Financial Engineering, 2011, 2nd Edition FE Press, New York.
2. John C. Hull and Sankarshan Basu, Options, futures & other derivatives, 2018, 10th edition, Pearson India.
3. Tsay, Ruey S. Analysis of Financial Time Series, 2011, 3rd edition, John Wiley & Sons.
4. R. Seydel: Tools for Computational Finance, 2017, 6th edition, Springer.
5. David Ruppert, Statistics and Data Analysis for Financial Engineering, 2011, Springer

Web Links:

1. Corporate Finance Institute (CFI) - Capital Budgeting
Link: <https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-budgeting/>
2. Investopedia - Time Value of Money
<https://www.investopedia.com/terms/t/timevalueofmoney.asp>
3. The Balance - Health Insurance Explained
<https://www.thebalance.com/health-insurance-4070812>

Online Resources:

1. Coursera - Financial Management Courses
<https://www.coursera.org/browse/business/financial-management>
2. Khan Academy - Finance and Capital Markets
<https://www.khanacademy.org/finance-economics>
3. NPTEL COURSE: Financial Accounting and Analysis (Prof. S. K. Agarwal, IIT Kanpur)
<https://nptel.ac.in/courses/110/105/110105102/>



Evaluation Scheme:

Semester End Examination (A):

Theory:

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Continuous Assessment (B)

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Vice Principal

Principal



Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Empowered Autonomous College Affiliated to the University of Mumbai)



DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

POLICY ON

INTERNSHIP

(ON JOB TRAINING [OJT])

CUM PROJECT

Course Code : DJS23IPELX14





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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 commitments.

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.

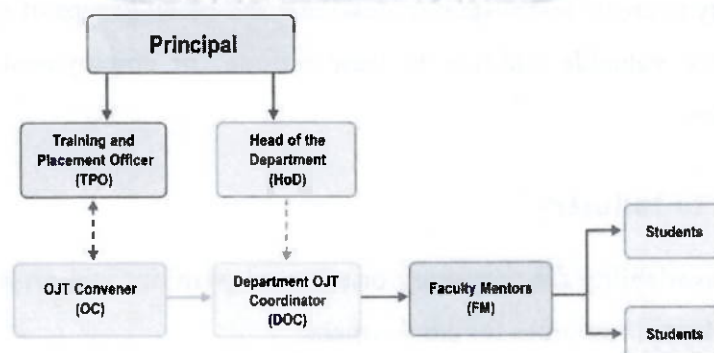


Fig. 1: Internship (OJT) Cum Project Hierarchy Structure



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.



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



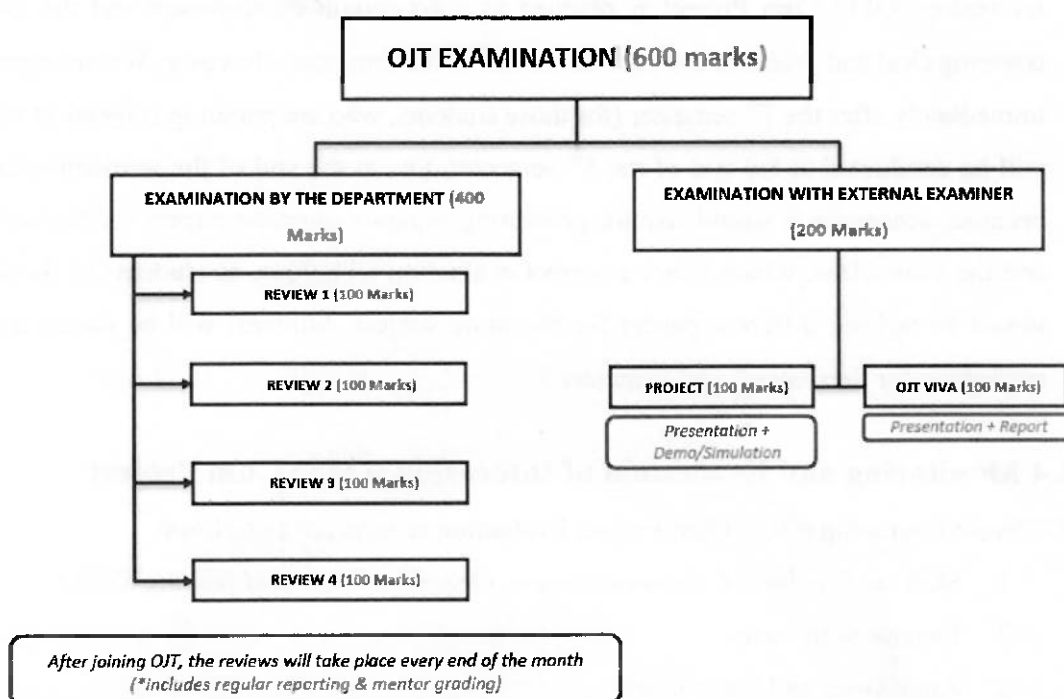


Fig. 2: Internship (OJT) Cum Project Evaluation Process

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.

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_netit.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%20IGNCA_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: Final Year B.Tech in Computer Science and Engineering (IoT and Cybersecurity with Block chain Technology)								Semester: VIII			
Course: Ethical Hacking and AI System Security								Course Code: DJS23BCSC801			
Teaching Scheme (Hours /week)				Evaluation Scheme							
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)				Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Term Test 3	Total	40
				--			15	15	10	40	
				Laboratory Examination			Term work				
1	-	-	1	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation / Journal			--
				--	--	--	-	--	--	--	

Coursera Course: Ethical Hacking and AI System Security Link:

<https://www.coursera.org/learn/security-and-ethical-hacking-attacking-web-ai-systems>

Number of hours: 25Hrs, Intermediate level

About the Course:

The course covers server-side and client-side web attacks, vulnerabilities such as path traversal, file-upload exploits, command injection, XSS and CSRF, along with security risks in LLM-based agents and adversarial machine learning. It also introduces practical attack and defense techniques through hands-on exercises, making it valuable for developing skills in **cybersecurity, ethical hacking, application security, AI security, and responsible AI**.

When you enroll in this course, you'll also be enrolled in this Specialization.

- Learn new concepts from industry experts
- Gain a foundational understanding of a subject or tool
- Earn a shareable career certificate

Course Outcomes: On successful completion of this course, student should be able to understand

1. **Understand and identify** fundamental concepts of ethical hacking, web application security, and vulnerabilities in AI/LLM-based systems.
2. **Analyze common web application attacks** such as XSS, CSRF, command injection, path traversal, and file-upload vulnerabilities using ethical hacking techniques.
3. **Evaluate security risks in AI systems**, including LLM-based applications, AI agents, and adversarial attacks, through practical security assessment techniques.
4. **Apply appropriate security measures** to detect, mitigate, and prevent web and AI-related cyber threats while following responsible and ethical cybersecurity practices.



Detailed Syllabus:		
Unit	Description	Duration
1	Server Side Attacks Assessment Expectations ,AI Citation and Acknowledgement , BurpSuite Proxy and Browser, Evolution of HTTP ,Path Traversal ,File upload exploits,OS Command Injection Overview,Business Logic Assumptions and Bypasses .	10
2	Client-Side Web Exploitation Javascript Introduction, Evasion: Understanding String Encoding on the Web,Cross Site Scripting ,Mitigating Cross Site Scripting , XSS History - The Myspace Worm , CSRF and Defenses ,Clickjacking, Misconfigurations in Cross Origin Resource Sharing .	08
3	Language Model-based Agentic Systems Overview of Language-Model Driven Attacks . OWASP TOP 10 LLM minutes, LLM Agent Function-calling Process.	04
4	Advanced Topics - Adversarial AI Overview of Attacks on ML Systems , OWASP Top Ten ML Paper: Security and Privacy in Machine Learning Paper: Poisoning, Backdooring Contrastive Learning Paper: Extracting Training Data From Diffusion Models .	03
TOTAL		25

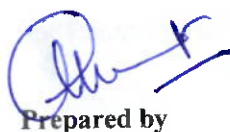
Continuous Assessment (B) Evaluation

Scheme:

1. The identified courses shall focus on developing AI-related competencies and skills among students. Each selected course shall carry one (1) credit.
2. Faculty members shall act as mentors for the Coursera courses identified for various semesters of the program.
3. One faculty mentor shall be assigned to each division of the program for effective coordination and monitoring of this activity.
4. The assigned faculty mentor shall complete and review the course content before assigning the course to students.
5. The term work for these one-credit courses shall form a part of the Internal Continuous Assessment (ICA) component.
6. The Term work (ICA) component shall carry **40 marks**

The distribution of marks for term work shall be as follows:

- **15 Marks:** Coursera Course Completion and Certification
- **15 Marks:** Faculty-curated quiz conducted through the Coursera/Any other platform
- **10 Marks:** Internal faculty evaluation through quizzes, assignments, presentations, or Project


Prepared by


Checked by


Head of the Department


Vice Principal


Principal