# MAHATMA GANDHI UNIVERSITY

**Kottayam, Kerala**

**Undergraduate Programmes (HONOURS)**
**2026 Admission Onwards**

| SYLLABUS | | | |
|---|---|---|---|
| **SIGNATURE COURSE** | | | |
| **Name of the College** | NSS College, Rajakumari | | |
| **Faculty/ Discipline** | Electronics with Computer Technology | | |
| **Programme** | BSc (Hons) Electronics with Computer Technology | | |
| **Course Coordinator** | Dr. Saritha M | | |
| **Contributors** | | | |
| **Course Name** | Foundations of Prompt Engineering and Large Language Models | | |
| **Type of Course** | DSE | | |
| **Specialization title** | Agentic AI for Intelligent Digital Design | | |
| **Course Code** | MG3DSEECTA01 | | |
| **Course Level** | 200 | | |
| **Course Summary** | To introduce students to Generative AI, Large Language Models, Prompt Engineering, and AI-assisted engineering workflows. | | |
| **Semester** | 3 | **Credits** | 4 |

**Course Details**

| Learning Approach | Tutorial | Total Hours |
|---|---|---|
| Credits | 4 | 60 |

| | |
|---|---|
| **Pre-requisites, if any** | Basics of Computer Programming |

**Course Outcomes (CO)**

| Number of COs | | 4 | |
|---|---|---|---|
| **CO No.** | **Expected Course Outcome** | **Learning Domains *** | **PO No** |
| 1 | Explain the fundamentals of AI, Generative AI, and LLMs | U | PO1, PO2, PO10 |
| 2 | Apply prompt engineering techniques effectively | A, An | PO2, PO5 |
| 3 | Use LLM tools for engineering tasks | An, E | PO3, PO5 |
| 4 | Analyze applications of AI in digital electronics | S | PO1, PO2 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**CO-PO Articulation Matrix**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | - | - | - | - | - | - | - | 3 |
| CO 2 | - | 3 | - | - | 3 | - | - | - | - | - |

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | - | - | 3 | - | 3 | - | - | - | - | - |
| CO 4 | 3 | 3 | - | - | - | - | - | - | - | - |

*'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).*

**Course Content**

Content for Classroom transaction (Units)

| Module | Units | Course Description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | Introduction to Artificial Intelligence and Generative AI | | | |
| | 1.1 | Evolution of AI, Narrow AI vs General AI, AI applications in Electronics Engineering | 3 | ["1"] |
| | 1.2 | Introduction to Generative AI, Text, image, code, and multimodal generation , Foundation models | 3 | ["1"] |
| | 1.3 | Overview of Large Language Models, Tokens, embeddings, context windows, Transformer architecture basics | 3 | ["1"] |
| | 1.4 | Applications of LLMs in Engineering, AI-assisted coding, AI for automation and design | 3 | ["1"] |
| 2 | Prompt Engineering Fundamentals | | | |
| | 2.1 | Introduction to Prompt Engineering, Prompt structure and anatomy | 3 | ["2"] |
| | 2.2 | Zero-shot prompting, One-shot prompting, Few-shot prompting | 3 | ["2"] |
| | 2.3 | Chain-of-thought prompting, Role-based prompting, Instruction tuning | 3 | ["2"] |
| | 2.4 | Prompt evaluation, Prompt optimization, Hallucination reduction | 3 | ["2"] |
| 3 | Working with Large Language Model Platforms | | | |
| | 3.1 | Introduction to Chat-based AI systems, API-based LLM usage | 4 | ["3"] |
| | 3.2 | Prompt engineering using APIs, Temperature, tokens, top-k, top-p | 5 | ["3"] |
| | 3.3 | AI-assisted Python programming, AI-assisted debugging | 4 | ["3"] |
| | 3.4 | Mini projects using LLMs, Report generation, Engineering document automation | 5 | ["3"] |
| 4 | Large Language Model Applications in Electronics | | | |
| | 4.1 | AI for HDL code generation, AI-assisted digital logic design | 6 | ["4"] |
| | 4.2 | AI-generated testbenches, AI-assisted simulation workflows | 6 | ["4"] |
| | 4.3 | Ethical AI, Responsible AI engineering | 3 | ["4"] |
| | 4.4 | Future of AI in EDA, Intelligent chip design ecosystems | 3 | ["4"] |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>Project-Based, Laboratory-Oriented, and Outcome-Based Learning (OBL) approach. Since undergraduate Electronics students may initially have a limited background in AI, the pedagogy gradually progresses through Conceptual Understanding, Guided Experimentation, and AI Workflow Development. The overall approach emphasizes: Hands-on learning, Mini-projects, AI-assisted experimentation, Laboratory demonstrations, Collaborative learning, and Design thinking |

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| **Assessment Types** | **MODE OF ASSESSMENT**<br>Mode of Assessment: Practical<br><br>**A. Continuous Comprehensive Assessment (CCA)**<br>• **Practical – 30 Marks**<br>Weekly experiments 5, Lab Assignments 5, Mini Project 10, Viva Voce 10<br><br>**B. End Semester Evaluation (ESE)**<br>• **Practical – 70 Marks**<br>Assessment Methods – Problem Definition 10, System Design 15, Implementation 15, Innovation 5-, Documentation 5, Presentation and Viva 20<br>Duration of Examination – 2.00 Hrs |

## References


- 1. Hands-On Large Language Models, Jay Alammar, Maarten Grootendorst, O'Reilly Media,2024 2. Prompt Engineering for Generative AI, James Phoenix, Mike Taylor, O'Reilly Media,2024 3. Deep Learning, Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press, 2016 4. Natural Language Processing with Transformers, Lewis Tunstall, Leandro von Werra, Thomas Wolf, O'Reilly Media,2022 5. Generative Deep Learning, David Foster, O'Reilly Media, 2nd Edition, 2022


## Suggested Readings


- 1. "Attention Is All You Need", Ashish Vaswani et al., NeurIPS 2017, 2. "A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT", Jules White et al., arXiv, 2023 3. "ChainForge: A Visual Toolkit for Prompt Engineering and LLM Hypothesis Testing", Ian Arawjo et al., arXiv, 2023


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**Kottayam, Kerala**

**Undergraduate Programmes (HONOURS)**
**2026 Admission Onwards**

| SYLLABUS | | | |
|---|---|---|---|
| **SIGNATURE COURSE** | | | |
| **Name of the College** | NSS College, Rajakumari | | |
| **Faculty/ Discipline** | Electronics with Computer Technology | | |
| **Programme** | BSc (Hons) Electronics with Computer Technology | | |
| **Course Coordinator** | Dr. Saritha M | | |
| **Contributors** | | | |
| **Course Name** | LangChain, LangGraph and Retrieval-Augmented Generation | | |
| **Type of Course** | DSE | | |
| **Specialization title** | Agentic AI for Intelligent Digital Design | | |
| **Course Code** | MG4DSEECTA01 | | |
| **Course Level** | 200 | | |
| **Course Summary** | To train students in AI orchestration frameworks, memory systems, workflows, and Retrieval-Augmented Generation systems. | | |
| **Semester** | 4 | **Credits** | 4 |

**Course Details**

| Learning Approach | Tutorial | Total Hours |
|---|---|---|
| Credits | 4 | 60 |

| **Pre-requisites, if any** | Basic Python Knowledge |
|---|---|

**Course Outcomes (CO)**

| **Number of COs** | | **4** | |
|---|---|---|---|
| **CO No.** | **Expected Course Outcome** | **Learning Domains *** | **PO No** |
| 1 | Explain LangChain and LangGraph architectures | U | PO1, PO5, PO10 |
| 2 | Develop AI workflows using chains and agents | C | PO2, PO3, PO5 |
| 3 | Build graph-based multi-agent systems | I | PO4, PO5, PO9 |
| 4 | Implement RAG systems using vector databases | C, I, Ap | PO4, PO5 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**CO-PO Articulation Matrix**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | - | - | - | 3 | - | - | - | - | 3 |
| CO 2 | - | 3 | 3 | - | 3 | - | - | - | - | - |

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | - | - | - | 3 | 3 | - | - | - | 3 | - |
| CO 4 | - | - | - | 3 | 3 | - | - | - | - | - |

*'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).*

**Course Content**

Content for Classroom transaction (Units)

| Module | Units | Course Description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | LangChain Fundamentals | | | |
| | 1.1 | Introduction to LangChain, Components and architecture | 4 | ["1"] |
| | 1.2 | Models and prompts, Prompt templates | 3 | ["1"] |
| | 1.3 | Chains, Sequential chains, Router chains | 4 | ["1"] |
| | 1.4 | Output parsers, Memory systems, Conversation management | 4 | ["1"] |
| 2 | Advanced LangChain | | | |
| | 2.1 | Tools and agents, Function calling | 3 | ["2"] |
| | 2.2 | Document loaders, Text splitters | 4 | ["2"] |
| | 2.3 | Embeddings and vector databases | 4 | ["2"] |
| | 2.4 | Conversational AI applications, Engineering assistants | 4 | ["2"] |
| 3 | LangGraph | | | |
| | 3.1 | Introduction to LangGraph, Stateful workflows | 4 | ["3"] |
| | 3.2 | Nodes and edges, Conditional routing | 3 | ["3"] |
| | 3.3 | Multi-agent workflows, Supervisor agents | 4 | ["3"] |
| | 3.4 | Building graph-based AI systems, Debugging workflows | 4 | ["3"] |
| 4 | Retrieval-Augmented Generation (RAG) | | | |
| | 4.1 | Fundamentals of RAG | 3 | ["4"] |
| | 4.2 | Vector stores , Similarity search | 4 | ["4"] |
| | 4.3 | Engineering document retrieval, Verilog knowledge assistants | 4 | ["4"] |
| | 4.4 | Building Electronics-focused RAG systems | 4 | ["4"] |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>Framework-Oriented Learning: Teaching focuses on: Building blocks of AI applications, Workflow orchestration, and Agent pipelines. Laboratory-Centered Instruction: Every module contains: Coding labs, Step-by-step workflow construction, and Incremental AI application development |

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| **Assessment Types** | **MODE OF ASSESSMENT**<br>Mode of Assessment: Practical<br><br>**A. Continuous Comprehensive Assessment (CCA)**<br>**• Practical – 30 Marks**<br>Weekly experiments 5, Lab Assignments 5, Mini Project 10, Viva Voce 10<br><br>**B. End Semester Evaluation (ESE)**<br>**• Practical – 70 Marks**<br>Assessment Methods – Problem Definition 10, System Design 15, Implementation 15, Innovation 10, Documentation 5, Presentation and Viva 15<br>Duration of Examination – 2.00 Hrs |

## References


- 1. Building Generative AI Agents, Tom Taulli, Gaurav Deshmukh, Apress / Springer Nature, 2025 2. Generative AI with LangChain, Ben Auffarth, Leonid Kuligin, Packt Publishing, 2nd Edition, 2025 3. Designing Machine Learning Systems, Chip Huyen, O'Reilly Media, 2022 4. AI Engineering, Chip Huyen, O'Reilly Media, 2025


## Suggested Readings


- 1. "Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks", Patrick Lewis et al., NeurIPS 2020 2. "Exploration of LLM Multi-Agent Application Implementation Based on LangGraph+CrewAI", Zhihua Duan, Jialin Wang, arXiv, 2024 3. "Architecting Resilient LLM Agents: A Guide to Secure Plan-then-Execute Implementations", Ron F. Del Rosario et al., arXiv, 2025


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**Kottayam, Kerala**

**Undergraduate Programmes (HONOURS)**
**2026 Admission Onwards**

| SYLLABUS | | | |
|---|---|---|---|
| **SIGNATURE COURSE** | | | |
| **Name of the College** | NSS College, Rajakumari | | |
| **Faculty/ Discipline** | Electronics with Computer Technology | | |
| **Programme** | BSc (Hons) Electronics with Computer Technology | | |
| **Course Coordinator** | Dr. Saritha M | | |
| **Contributors** | | | |
| **Course Name** | Multi-Agent AI Systems for Digital Design | | |
| **Type of Course** | DSE | | |
| **Specialization title** | Agentic AI for Intelligent Digital Design | | |
| **Course Code** | MG5DSEECTA01 | | |
| **Course Level** | 300 | | |
| **Course Summary** | To introduce multi-agent AI frameworks and digital design fundamentals required for intelligent hardware automation | | |
| **Semester** | 5 | **Credits** | 4 |

**Course Details**

| Learning Approach | Tutorial | Total Hours |
|---|---|---|
| Credits | 4 | 60 |

| **Pre-requisites, if any** | Python Programming Skill and Basic Digital Design Knowledge |
|---|---|

**Course Outcomes (CO)**

| Number of COs | | 4 | |
|---|---|---|---|
| **CO No.** | **Expected Course Outcome** | **Learning Domains *** | **PO No** |
| 1 | Explain multi-agent AI architectures | A, An | PO5, PO6 |
| 2 | Develop workflows using CrewAI and AutoGen | C | PO2, PO3, PO5 |
| 3 | Apply Verilog HDL for digital circuit modeling | C, I, Ap | PO1, PO2, PO3 |
| 4 | Design Mealy and Moore FSMs | S | PO3, PO4, PO5 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**CO-PO Articulation Matrix**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | - | - | - | - | 3 | 3 | - | - | - | - |
| CO 2 | - | 3 | 3 | - | 3 | - | - | - | - | - |

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | 3 | 3 | 3 | - | - | - | - | - | - | - |
| CO 4 | - | - | 3 | 3 | 3 | - | - | - | - | - |

*'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).*

**Course Content**

Content for Classroom transaction (Units)

| Module | Units | Course Description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | CrewAI Fundamentals | | | |
| | 1.1 | Introduction to multi-agent systems, Agent collaboration | 4 | ["1"] |
| | 1.2 | CrewAI Agents, tasks, crews architecture, | 4 | ["1", "2"] |
| | 1.3 | Sequential and hierarchical workflows | 4 | ["1", "2"] |
| | 1.4 | Engineering automation using CrewAI | 3 | ["1", "2"] |
| 2 | AutoGen Framework | | | |
| | 2.1 | Introduction to AutoGen | 3 | ["2"] |
| | 2.2 | Conversable agents, Agent communication | 4 | ["2"] |
| | 2.3 | Multi-agent coding systems | 4 | ["1", "2"] |
| | 2.4 | AI-assisted debugging and verification | 4 | ["1", "2"] |
| 3 | Introduction to Digital Design and Verilog | | | |
| | 3.1 | Digital logic fundamentals , Combinational and sequential circuits | 2 | ["3"] |
| | 3.2 | Introduction to Verilog HDL, Modules and testbenches | 5 | ["3"] |
| | 3.3 | Introduction to Icarus Verilog, Simulation workflows | 4 | ["3"] |
| | 3.4 | AI-assisted Verilog code generation | 4 | ["3"] |
| 4 | Finite State Machine Design and Intelligent Verification | | | |
| | 4.1 | Finite State Machines, State diagrams | 5 | ["4"] |
| | 4.2 | Mealy machines, Moore machines | 4 | ["4"] |
| | 4.3 | Verilog implementation of FSMs | 3 | ["4"] |
| | 4.4 | AI-assisted FSM verification and debugging | 3 | ["4"] |

| | |
|---|---|
| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>This course integrates Interdisciplinary Learning with AI agents, Verilog, FSM design, and Digital Electronics. The teaching approach consistently connects AI concepts to hardware concepts. Simulation-Based Teaching: Students learn through Verilog simulation, AI-generated HDL testing, and - FSM visualization |

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| **Assessment Types** | **MODE OF ASSESSMENT**<br>Mode of Assessment: Practical<br><br>**A. Continuous Comprehensive Assessment (CCA)**<br>**• Practical – 30 Marks**<br>Weekly experiments 5, Lab Assignments 5, Mini Project 10, Viva Voce 10<br><br>**B. End Semester Evaluation (ESE)**<br>**• Practical – 70 Marks**<br>Assessment Methods – Problem Definition 10, System Design 15, Implementation 15, Innovation 10, Documentation 10, Presentation and Viva 10<br>Duration of Examination – 2.00 Hrs |

## References


- 1. Building Generative AI Agents, Tom Taulli, Gaurav Deshmukh, Apress / Springer Nature, 2025 2. Digital Design, M. Morris Mano, Michael D. Ciletti, Pearson Education, 6th Edition 3. Verilog HDL, Samir Palnitkar, Pearson Education, 2nd Edition 4. Fundamentals of Digital Logic with Verilog Design, Stephen Brown, Zvonko Vranesic, McGraw-Hill Education, 3rd Edition 5. Icarus Verilog Documentation, Stephen Williams and contributors, Open-source community


## Suggested Readings


- 1. “AutoGen: Enabling Next-Gen LLM Applications via Multi-Agent Conversation, Qingyun Wu et al., Microsoft Research, Penn State University, arXiv, 2023 2. “ReAct: Synergizing Reasoning and Acting in Language Models”, Shunyu Yao et al., ICLR 2023 3. “Generative Agents: Interactive Simulacra of Human Behavior”, Joon Sung Park et al., UIST 2023


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**2026 Admission Onwards**

| SYLLABUS | | | |
|---|---|---|---|
| **SIGNATURE COURSE** | | | |
| **Name of the College** | NSS College, Rajakumari | | |
| **Faculty/ Discipline** | Electronics with Computer Technology | | |
| **Programme** | BSc (Hons) Electronics with Computer Technology | | |
| **Course Coordinator** | Dr. Saritha M | | |
| **Contributors** | | | |
| **Course Name** | Intelligent Digital Hardware Design | | |
| **Type of Course** | DSE | | |
| **Specialization title** | Agentic AI for Intelligent Digital Design | | |
| **Course Code** | MG6DSEECTA00 | | |
| **Course Level** | 300 | | |
| **Course Summary** | To integrate AI agents, LLMs, Verilog design, simulation, verification, and autonomous engineering workflows into complete intelligent digital design systems. | | |
| **Semester** | 6 | **Credits** | 4 |

**Course Details**

| Learning Approach | Tutorial | Total Hours |
|---|---|---|
| Credits | 4 | 60 |

| | |
|---|---|
| **Pre-requisites, if any** | Knowledge of Multi- Agent systems and Verilog HDL |

**Course Outcomes (CO)**

| **Number of COs** | | **4** | |
|---|---|---|---|
| **CO No.** | **Expected Course Outcome** | **Learning Domains *** | **PO No** |
| 1 | Explain intelligent EDA architectures | A, An, E | PO1, PO5 |
| 2 | Develop AI agents for HDL generation | C | PO2, PO3, PO5 |
| 3 | Build autonomous verification workflows | C | PO2, PO3, PO5 |
| 4 | Integrate LLMs with digital simulation tools | S | PO3, PO4, PO5 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**CO-PO Articulation Matrix**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | - | - | - | 3 | - | - | - | - | - |
| CO 2 | - | 3 | 3 | - | 3 | - | - | - | - | - |

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | - | 3 | 3 | - | 3 | - | - | - | - | - |
| CO 4 | - | - | 3 | 3 | 3 | - | - | - | - | - |

*'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).*

**Course Content**

Content for Classroom transaction (Units)

| Module | Units | Course Description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | Architecture of Intelligent EDA Systems | | | |
| | 1.1 | Introduction to Intelligent EDA | 3 | ["1"] |
| | 1.2 | AI-assisted hardware development lifecycle | 4 | ["1"] |
| | 1.3 | Autonomous design workflows | 4 | ["1"] |
| | 1.4 | Human-in-the-loop hardware AI systems | 4 | ["1"] |
| 2 | I Agents for Digital Design | | | |
| | 2.1 | Requirement analysis agents | 4 | ["2"] |
| | 2.2 | Verilog code generation agents | 4 | ["2"] |
| | 2.3 | Testbench generation agents | 3 | ["2"] |
| | 2.4 | Simulation and debugging agents | 4 | ["2"] |
| 3 | Intelligent Hardware Verification | | | |
| | 3.1 | Functional verification concepts | 4 | ["3"] |
| | 3.2 | AI-assisted waveform analysis | 4 | ["3"] |
| | 3.3 | Automated bug detection | 3 | ["3"] |
| | 3.4 | Intelligent optimization workflows | 4 | ["3"] |
| 4 | Agentic AI System | | | |
| | 4.1 | Agentic AI System | 4 | ["4"] |
| | 4.2 | Autonomous FSM generator | 4 | ["4"] |
| | 4.3 | End-to-end AI-based hardware workflow | 4 | ["4"] |
| | 4.4 | Final project presentation and evaluation | 3 | ["4"] |

| | |
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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>This course follows a Project-driven pedagogy and System integration approach. Students integrate their knowledge of Prompt Engineering, LangChain, LangGraph, CrewAI, AutoGen, and Verilog workflows into a complete intelligent EDA system. |

| | |
|---|---|
| **Assessment Types** | **MODE OF ASSESSMENT**<br>Mode of Assessment: Practical<br><br>**A. Continuous Comprehensive Assessment (CCA)**<br>**• Practical – 30 Marks**<br>Weekly experiments 5, Lab Assignments 5, Mini Project 10, Viva Voce 10<br><br>**B. End Semester Evaluation (ESE)**<br>**• Practical – 70 Marks**<br>Assessment Methods – Problem Definition 10, System Design 15, Implementation 15, Innovation 10, Documentation 5, Presentation and Viva 15<br>Duration of Examination – 2.00 Hrs |

## References


- 1. CMOS VLSI Design, Neil H. E. Weste, David Harris, Pearson Education, 4th Edition 2. Digital Integrated Circuits, Jan M. Rabaey, Anantha Chandrakasan, Borivoje Nikolic, Pearson Education, 2nd Edition 3. Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norvig, Pearson, 4th Edition 4. Machine Learning System Design, Valerii Babushkin, Arseny Kravchenko, Manning Publications, 2024


## Suggested Readings


- 1. “ChipNeMo: Domain-Adapted LLMs for Chip Design”, NVIDIA Research, arXiv, 2023


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