

# MCA with AI Integration

*Integration: 4 Credits | 42 Hours | 3 Global Certifications | Fee: 70,000 INR per Semester*

GJIMT offers unique 4 Semester MCA program with **applied, tool-dependent AI integration**, ensuring strong computing fundamentals while embedding AI for software development, data handling, and intelligent systems.

## Why you should do this Program:

- ✓ Strong programming & system design foundations
  - ✓ AI-augmented software development skills
  - ✓ Ethical, secure, and scalable system thinking
  - ✓ High employability for software, data, and AI roles
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## Semester 1: Programming Foundations & Computer Systems

### Core Focus:

Programming in C/C++, Data Structures, Computer Organization, Operating Systems, Discrete Mathematics, Communication Skills.

### AI Integration Focus:

- Logic building with AI support
- Code understanding and debugging
- Structured documentation

### AI Tools Integrated:

- **ChatGPT / Gemini** – Algorithm explanation, dry runs, debugging logic
- **GitHub Copilot** – Assisted coding (syntax & refactoring)
- **Grammarly AI** – Technical documentation
- **Notion AI** – Structured notes and lab documentation

### Benchmarked Shadow Projects

- **Algorithm Optimization Study (Google)**: Compare time and space complexity of alternative algorithms for the same problem.  
*AI Tools:* ChatGPT (complexity explanation), Copilot (refactoring suggestions).
- **System Utility Program (Microsoft)**: Develop a small utility (file handler / process monitor) with clean logic and documentation.  
*AI Tools:* Copilot (code completion), ChatGPT (logic validation), Notion AI (documentation).
- **Data Structure Performance Evaluation (Amazon)**: Analyse performance of stacks, queues, and linked lists for real-use scenarios.  
*AI Tools:* ChatGPT (scenario mapping), Excel AI (performance tables).

*Execution Mode:* Code development + AI-assisted reasoning + documentation.

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## Semester 2: Database Systems, OOP & Software Engineering

### Core Focus:

Java / Python Programming, DBMS, Software Engineering, Web Technologies.

### AI Integration Focus:

- Object-oriented thinking
- Database design & optimisation
- Software lifecycle understanding

### AI Tools Integrated:

- **ChatGPT** – OOP design patterns, SQL query optimisation
- **GitHub Copilot** – Backend & API scaffolding
- **Draw.io AI / Lucid AI** – UML & ER diagrams
- **Excel AI** – Test case and defect analysis

### Benchmarked Shadow Projects

- **Database Design & Optimisation Project (Oracle)**: Design ER models and optimise queries for a business scenario.  
*AI Tools:* ChatGPT (normalisation & query tuning), Draw.io AI (ER diagrams).
- **OOP-Based Application Module (Salesforce)**: Build a modular application following OOP principles.  
*AI Tools:* Copilot (class scaffolding), ChatGPT (design validation).
- **Software Testing & Defect Analysis (Infosys)**: Analyse test cases, defects, and resolution cycles.  
*AI Tools:* Excel AI (defect trends), ChatGPT (root cause analysis).

*Execution Mode:* AI-supported design → coding → validation.

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## Semester 3: Data Analytics, AI Concepts & Electives

### Core Focus:

Data Analytics, Artificial Intelligence, Machine Learning Basics, Electives.

### AI Integration Focus:

- Data-driven reasoning
- Model understanding (not black-box usage)
- Visual analytics

### AI Tools Integrated:

- **Python (with AI Assist)** – Data analysis & ML pipelines
- **ChatGPT** – Model explanation, feature selection
- **Power BI / Looker Studio** – Analytics dashboards
- **Google Colab** – Experimentation

## Benchmarked Shadow Projects

**Customer Data Analytics Project (Netflix):** Analyse user behaviour and retention patterns.  
*AI Tools:* Python + ChatGPT (EDA & insights), Power BI (visual dashboards).

- **ML Model Comparison Study (IBM):** Compare ML algorithms for accuracy and interpretability.  
*AI Tools:* ChatGPT (model reasoning), Python (training & evaluation).
- **Predictive Analytics Mini-Project (Uber):** Forecast demand or usage using historical data.  
*AI Tools:* Python (models), ChatGPT (feature & result interpretation).

*Execution Mode:* AI-assisted analytics → interpretation → reporting.

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## Semester 4: Major Project, Cybersecurity & Emerging Technologies

### Core Focus:

Major Project, Seminar, Cybersecurity, Cloud Computing, Emerging Technologies.

### AI Integration Focus:

- Applied AI systems
- Secure and ethical AI usage
- Industry-ready project execution

### AI Tools Integrated:

- **ChatGPT (Advanced / Research Mode)** – Architecture planning, documentation
- **GitHub Copilot** – Full-stack assistance
- **Cloud AI Tools (AWS / Azure)** – Deployment & scalability
- **Turnitin / Copyleaks** – Ethical compliance

## Benchmarked Shadow Projects

**AI-Enabled Application Prototype (Google / Meta):** Design and implement an intelligent application.

*AI Tools:* Copilot (code), ChatGPT (architecture & logic).

- **Cybersecurity Threat Analysis (Palo Alto / Cisco):** Analyse logs and identify threat patterns.  
*AI Tools:* ChatGPT (threat modelling), Excel AI (log analysis).
- **Cloud-Based Deployment Project (AWS):** Deploy and document a scalable application.  
*AI Tools:* ChatGPT (deployment planning), Cloud AI services.

*Execution Mode:* End-to-end AI-enabled system development.

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