BCA with AI Integration

Integration: 4 Credits | 42 Hours | 3 Global Certifications | Fee: 50,000 INR per Semester

GJIMT offers a unique **BCA Program** with **AI-enabled, tool-dependent experiential learning model** with the emphasis on **computing foundations, applied development, analytics, and industry readiness**, not replacing core programming with AI.

Why you should do this Program

✓ Strong programming and system foundations
✓ AI-augmented development and analytics skills
✓ Secure, ethical and scalable computing mindset
✓ High employability for software, analytics and IT roles

Semester 1: Programming Fundamentals & Computer Basics

Core Focus:
Programming in C, Computer Fundamentals, Digital Logic, Mathematics, Communication Skills.

AI Integration Focus:

• Logic building and problem understanding
• Code explanation and debugging
• Technical documentation

AI Tools Integrated:

- **ChatGPT / Gemini** – Logic explanation, dry runs, debugging support

- **GitHub Copilot** – Syntax assistance (controlled use)

- **Grammarly AI** – Technical writing

- **Notion AI** – Lab notes and documentation

Benchmarked Shadow Projects

- **Algorithm Logic Comparison (Google):** Compare alternative logic approaches for the same C problem.
  AI Tools: ChatGPT (logic reasoning), Copilot (refactoring suggestions).

- **Utility Program Development (Microsoft):** Develop a basic utility program with proper documentation.
  AI Tools: Copilot (code assistance), Notion AI (documentation).

Semester 2: Data Structures, OOP & Operating Systems

Core Focus:
Data Structures, Object-Oriented Programming, Operating Systems, Discrete Mathematics.

AI Integration Focus:

• Data structure selection
• Object-oriented design thinking
• System behaviour understanding

AI Tools Integrated:

- **ChatGPT** – DS & OOP explanation, design validation

- **GitHub Copilot** – Class and method scaffolding

- **Draw.io AI / Lucid AI** – Flowcharts and class diagrams

Benchmarked Shadow Projects

- **Data Structure Performance Study (Amazon):** Compare stacks, queues, and linked lists for real scenarios.
  AI Tools: ChatGPT (scenario mapping), Excel AI (performance tables).

- **OOP Module Design (Salesforce):** Build a small OOP-based application module.
  AI Tools: Copilot (class scaffolding), ChatGPT (design validation).

Semester 3: Database Systems, Web Technologies & Software Engineering

Core Focus:
DBMS, Web Programming, Software Engineering, Numerical Methods.

AI Integration Focus:

• Database design & optimisation
• Web application structuring
• SDLC understanding

AI Tools Integrated:

- **ChatGPT** – SQL optimisation, SDLC guidance

- **GitHub Copilot** – Backend & frontend assistance

- **Draw.io AI** – ER & UML diagrams

- **Excel AI** – Test case and defect tracking

Benchmarked Shadow Projects

- **Database Design & Query Optimisation (Oracle):** Design ER models and optimise queries.
  AI Tools: ChatGPT (normalisation & tuning), Draw.io AI (ER diagrams).

- **Web Application Module (Zoho):** Develop a functional web module with documentation.
  AI Tools: Copilot (code), ChatGPT (logic review).

Semester 4: Data Analytics, Python & Emerging Technologies

Core Focus:
Python Programming, Data Analytics, Cloud Basics, Elective I.

AI Integration Focus:

• Data analysis and interpretation
• Python-based problem solving
• Introductory cloud usage

AI Tools Integrated:

- **Python + AI Assist (ChatGPT)** – Data analysis & scripting

- **Google Colab** – Experimentation

- **Power BI / Looker Studio** – Analytics dashboards

Benchmarked Shadow Projects

- **Customer Data Analysis Project (Netflix):** Analyse usage and retention data.
  AI Tools: Python + ChatGPT (EDA), Power BI (visualisation).

- **Predictive Analytics Mini-Project (Uber):** Forecast demand or trends.
  AI Tools: Python models, ChatGPT (feature interpretation).

Semester 5: Advanced Development, Security & Electives

Core Focus:
Advanced Web Technologies, Cybersecurity, Elective II, Mini Project.

AI Integration Focus:

- Secure coding
- Application optimisation
- Industry-oriented development

AI Tools Integrated:

- **ChatGPT** – Secure coding practices, threat modelling

- **GitHub Copilot** – Code optimisation

- **Excel AI** – Security logs and issue tracking

Benchmarked Shadow Projects

- **Secure Web Application Review (OWASP / Google):** Identify vulnerabilities and propose fixes.
  AI Tools: ChatGPT (threat modelling), Excel AI (issue tracking).

- **Application Performance Optimisation (Meta):** Improve response time and efficiency.
  AI Tools: Copilot (refactoring), ChatGPT (performance insights).

Semester 6: Major Project, Cloud & Industry Readiness

Core Focus:
Major Project, Seminar, Cloud Computing, Professional Ethics.

AI Integration Focus:

- End-to-end system development
- Ethical and responsible AI usage
- Industry-ready documentation

AI Tools Integrated:

- **ChatGPT (Research & Architecture Mode)** – Project planning and documentation

- **GitHub Copilot** – Full-stack support

- **Cloud Platforms (AWS / Azure)** – Deployment & scaling

- **Turnitin / Copyleaks** – Ethical compliance

Benchmarked Shadow Projects

- **AI-Enabled Application Prototype (Google / Microsoft):** Build and deploy a functional application.
  AI Tools: Copilot (development), ChatGPT (architecture & logic).

- **Cloud Deployment & Documentation Project (AWS):** Deploy application and prepare technical documentation.
  AI Tools: ChatGPT (deployment planning), Cloud services.