BACHELOR OF COMPUTER APPLICATIONS (BCA) IN AI AUGMENTED SOFTWARE SYSTEMS

Industry Embedded Undergraduate Program

Offered by

St.Aloysius (Deemed to be University), Mangaluru

In academic collaboration with

Sierra Learning Academy

PROGRAM OVERVIEW

The **BCA in AI Augmented Software Systems** is an industry-aligned undergraduate program **designed to develop software professionals who can design, build, and operate real-world digital systems** in an AI- enabled environment.

The program integrates **core computer science, software engineering, data systems, cloud platforms, automation,** and **applied AI** into a single, coherent learning pathway. Students progress from computational fundamentals to system-level software development and finally into a **full-time industry internship** that replaces the traditional classroom-only final year.

This is not a conventional coding degree. It is a **software systems formation program**. In simple terms, students are trained to design, build, and maintain real-world software systems inside professional engineering teams not just learn programming languages or tools in isolation.

PROGRAM SNAPSHOT

Attribute	Details
Degree Awarded	Bachelor of Computer Applications (BCA)
Degree Duration	3 Years (6 Semesters)
Specialization	AI Augmented Software Systems
Mode	Full-time, On-Campus + Industry Embedded
Post-Degree Pathway	Postgraduate Professional Practice Year (Industry Employment Pathway)
Location	Mangaluru

WHO THIS PROGRAM IS DESIGNED FOR

This program is intended for students who want to:

- Build careers in **software development, systems engineering, cloud platforms, and AI-augmented applications**
- Learn how **real software products are architected, deployed, and maintained in production environments**
- Move beyond writing code to understand **system design, scalability, automation, and reliability**
- Graduate with **documented software projects, engineering discipline, and industry exposure**

This program does not focus on short-term coding tutorials or narrow tool-based training. It is designed for students who want to understand how software systems work end to end

LEARNING ARCHITECTURE:
HOW STUDENTS LEARN AND BUILD SOFTWARE

This program is designed around how modern software is actually developed and deployed in professional environments.

Instead of learning programming concepts in isolation, students work through complete software workflows understanding requirements, designing systems, writing code, testing deploying, and maintaining applications.

The curriculum follows a systems-first learning model, which means students are trained to think in terms of architecture, data flow, automation, and long-term system behavior.

HOW THIS WORKS IN PRACTICE:

Problem before code
Students learn to analyze requirements and constraints before writing programs

End-to-end software pipelines
From development and testing to deployment and monitoring

Engineering Discipline
Documentation, version control, debugging practices, and collaboration workflows

AI-integrated system design
Using AI tools for assistance, code generation, testing, and optimization while retaining human oversight

Security and governance
understanding data protection, system reliability, and responsible AI use

In practical terms, students spend less time memorizing syntax and more time **designing, building, testing, and improving working software systems.**

EMBEDDED INDUSTRY EXPOSURE (EVERY SEMESTER)

Applied Software Engineering Workshops

Applied Software Engineering Workshops are credit-bearing, structured interventions conducted across all semesters.They are designed to:

- **Bridge academic concepts with real development practices**
- **Expose students to current frameworks, tools, and engineering standards**
- **Reinforce professional expectations such as code quality, documentation, and delivery discipline**

Workshops cover areas such as backend and frontend systems, APIs, databases, cloud deployment, DevOps workflows, automation, and applied AI integration.

Senior-Led Technical Sessions

Senior-Led Technical Sessions are structured knowledge-sharing forums where students engaged in industry projects or internships share real-world development experiences with junior cohorts. Junior students learn to:

- **Understand production-level codebases**
- **Analyze architectural decisions**
- **Learn from real debugging, scaling, and deployment challenges**

This mirrors how engineers learn inside professional software teams.

Program Structure & Industry Progression

For Parents:

- The academic degree is completed in three years
- The third year is a paid, supervised industry internship
- The professional practice year is optional, merit-based, and post-degree

Years 1–2
Software & Systems Foundations
Core programming, data structures & scalable systems

Year 3
Full-Time Industry Internship (Academic Credit-Based)

Post-Degree
Professional Practice Year (Industry Employment Pathway)

The program is designed as a progressive transition from academic learning to professional practice, while preserving clear separation between the academic degree & post-degree professional pathways.

Academic & Industry Learning Journey

Semester I – Computational Foundations & Programming Basics

Focus Areas

- Computational thinking and problem-solving
- Programming fundamentals
- Discrete mathematics for computing
- Digital systems basics

Outcome

Students develop logical thinking and foundational programming skills required for software development.

Semester II – Data Structures, Databases & Applied Programming

Focus Areas

- Data structures and algorithms
- Database systems and SQL
- Object-oriented programming
- Introduction to software design principles

Outcome

Students learn to design efficient programs and manage structured data.

Semester III – Software Engineering, Web Systems & Applied AI

Focus Areas

- Software engineering methodologies
- Web application development
- APIs and backend systems
- Introduction to applied AI in software systems

Outcome

Students understand how scalable applications are architected and built.

Semester IV – Advanced Systems, Cloud & Automation

This semester focuses on system integration and deployment.

- **Cloud computing fundamentals**
- **DevOps and CI/CD pipelines**
- **System automation and scripting**
- **Security and performance basics**

Outcome

Students learn to deploy, manage, & maintain production-ready systems.

Year 3: Full-Time Industry Internship

The third year of the program is structured as a full-time, paid industry internship year.

Students are placed within partner organizations in India and abroad, including software companies, startups, IT services firms, and technology teams. They work on live systems, follow professional development cycles, and operate within real engineering environments. During this phase, students remain formally enrolled as learners, & academic credit is awarded based on industry evaluation, technical documentation, and reflective learning. Internship stipends are provided and governed by host organization policies. Students who do not meet professional or academic benchmarks are supported through review, remediation, or reassessment, as per institutional guidelines.

Outcome

Students graduate with real-world software development experience and professional references.

Postgraduate Professional Practice Year

Following completion of the three-year degree and internship, graduates may transition into a **Postgraduate Professional Practice Year.** This optional phase allows graduates to function in employee-grade software roles, focusing on performance, responsibility, and long-term system ownership. Entry level, role allocation, and compensation are merit-based, determined by academic performance, project quality, and internship evaluations.

Outcome

Graduates gain extended industry experience and accelerated career progression.

AI-NATIVE SOFTWARE ENGINEERING

Students learn to:

- Use AI-assisted coding and debugging tools responsibly
- Integrate machine learning models into applications
- Automate testing, documentation, and workflows
- Evaluate AI outputs for reliability, security, and bias

Responsible AI practices and system-level thinking are emphasized throughout.

ASSESSMENT PHILOSOPHY

Evaluation focuses on:

- Code quality and system design
- Problem-solving and debugging ability
- Documentation and workflow discipline
- Professional conduct and collaboration

Assessment methods include project reviews, system evaluations, code audits, and industry feedback.

Academic progression requires meeting defined performance benchmarks aligned with professional software engineering standards.

CAREER PATHWAYS

Career outcomes vary based on specialization, project experience, and professional performance.

Graduates are prepared for roles such as:

Software Developer

Full-Stack Engineer

Backend / API Developer

DevOps & Cloud Engineer

QA & Automation Engineer

AI-Augmented Software Professional

Entrepreneurial, freelance, and higher-study pathways are also supported.

ELIGIBILITY CRITERIA

- **Completion of 10+2 / PUC / equivalent**
- **Open to Science, Commerce, and Arts backgrounds**
- **Admission through screened aptitude assessment and personal interaction, as applicable**

COURSE FEES

- Detailed fee structure is shared during counselling and in the official fee circular
- Fees include academic instruction, lab access, workshops, and institutional facilities
- Internship stipends are governed by partner organization policies

MERIT-BASED INSTITUTIONAL SPONSORSHIP

A limited number of students may be offered Merit-Based Institutional Sponsorship based on performance during the admission assessment process.

Selected students may complete the academic program without upfront tuition payment. Post-graduation, sponsored students repay the program fee through a structured post-degree repayment mechanism, either during the Professional Practice Year or through independent professional engagement.

Repayment terms remain student-friendly, with interest rates based on repayment timelines and institutional conditions.

This sponsorship is highly selective, limited to up to six students per intake, and awarded purely on merit.

WHY THIS PROGRAM IS DIFFERENT

Software systems focus, not just coding

Industry exposure embedded every semester

Paid internship replacing classroom-only final year

**Professional experience at graduation**

AI and ML as core system-building disciplines

Important Note

This program is intentionally rigorous. Its strength lies in the discipline, workload, and industry alignment required.

Parents should note that this rigor is intentional and designed to ensure graduates are genuinely industry- ready, not just degree holders. Students willing to engage deeply will graduate with a significant professional advantage.
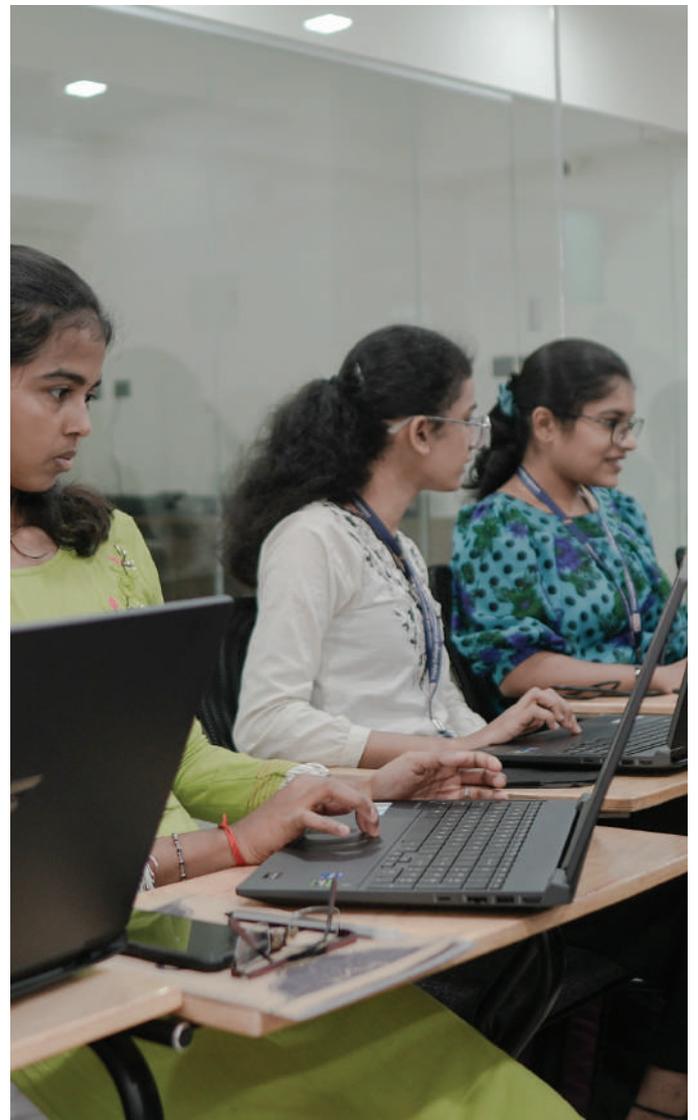
Frequently Asked Question

Is the Postgraduate Professional Practice Year mandatory?

No. **The academic degree is completed in three years**. The Postgraduate Professional Practice Year is an optional post-degree pathway designed for graduates who wish to extend industry immersion and transition into employee-grade professional roles.

What determines eligibility and compensation for the Postgraduate Professional Practice Year?

Eligibility and compensation are based on academic performance, project quality, and internship evaluations. Compensation is role-dependent and aligned with host organization policies. Compensation during the Postgraduate Professional Practice Year is role-dependent and aligned with the policies, performance frameworks, and compensation structures of the host organization. Based on current industry alignments, compensation typically ranges from **₹3.6 LPA – ₹7.2 LPA,** depending on role complexity, responsibility, demonstrated professional capability, and organizational standards.

What if a graduate does not opt for or qualify for the Professional Practice Year?

Graduates who do not opt for or qualify for the Professional Practice Year exit with a completed Bachelor of Computer Applications degree, documented paid internship experience & portfolio readiness **for independent placement, higher studies, or entrepreneurial pathways.**

Is the Merit-Based Institutional Sponsorship mandatory or binding?

No. The institutional sponsorship is optional, merit-based, and governed by clearly defined institutional terms. Students may choose standard fee payment instead.

WORKSHOPS AND INTERNSHIPS

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+91 82441 17701

bde@sierralearningacademy.com

+91 93535 04965
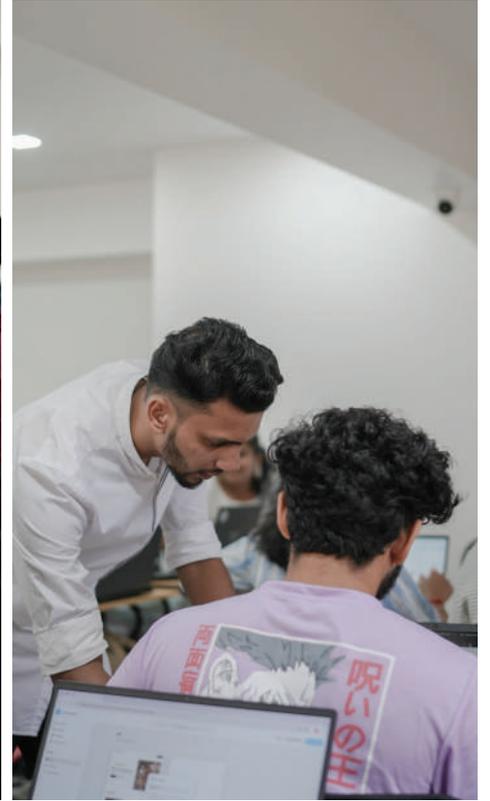
sierralearning.in

www.staloysius.edu.in

CONTACT SIERRA

📧 bde@sierralearningacademy.com

📞 +91 93535 04965

🌐 sierralearning.in

CONTACT ALOYSIUS

📞 +91 82441 17701

🌐 www.staloysius.edu.in