



# GALGOTIAS UNIVERSITY



**School of Computer Science and Engineering**  
**Department of Computer Science and Engineering**

**Curriculum for Program:**  
**Bachelor of Technology**  
**in**  
**Computer Science and Engineering**  
**Batch: 2026-2030**

## **Vision of the University**

*"To be known globally for value based education, research, innovation, outreach and sustainable practices"*

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## **Mission of the University**

- Enabling teaching learning ecosystem to support research and governance to achieve academic success.
  - Establish state-of-the-art facilities for impactful education and research.
  - Collaborate with stakeholders to align with new age curriculum and skill development.
  - Involvement in societal outreach programs to identify concerns and provide sustainable ethical solutions.
  - Encourage life-long learning and team-based problem-solving through an enabling environment.
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## **Vision of the Department**

*"To be recognized globally as a premier School of Computer Science and Engineering for imparting quality and value-based education within a multi-disciplinary and collaborative research-based environment."*

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## **Mission of the Department**

- M1:** Develop a strong foundation in fundamentals of Computer Science and engineering with responsiveness towards emerging technologies.
  - M2:** Establish state-of-the-art facilities and adopt education 4.0 practices to analyze, develop, test, and deploy sustainable ethical IT solutions by involving multiple stakeholders.
  - M3:** Foster multidisciplinary collaborative research in association with academia and industry through focused research groups, Centre of Excellence, and Industry Oriented R&D Labs.
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## **PEOs of the Program**

### **B. Tech. (CSE)**

**PEO1:** Graduates of Computer Science and Engineering will be engaged with leading Global Software Services and Product development companies handling projects in cutting edge technologies.

**PEO2:** Graduates of Computer Science and Engineering will be able to serve in technical or managerial roles at Government firms, Corporates and contribute to the society as successful entrepreneurs through start-up.

**PEO3:** Graduates of Computer Science and Engineering will undertake higher education, research or academia at institutions of transnational reputation.

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## Program Outcomes (POs)

### B. Tech. (CSE)

- PO1:** Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
- PO2:** Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
- PO3:** Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
- PO4:** Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
- PO5:** Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
- PO6:** The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
- PO7:** Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
- PO8:** Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
- PO9:** Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
- PO10:** Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
- PO11:** Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

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## PSOs of the Program

### B. Tech. (CSE)

- PSO1:** Have the ability to work with emerging technologies in Computer Science and Engineering requisite to Industry 4.0.
- PSO2:** Demonstrate Engineering Practice learned through industry internship and research project to solve live problems in various domains.

## List of Courses (Semester-Wise)

| First Semester B. Tech CSE |             |                                              |           |   |   |   |   |
|----------------------------|-------------|----------------------------------------------|-----------|---|---|---|---|
| Sl.No.                     | Course Code | Course Title                                 | L         | T | P | S | C |
| 1                          | 101         | AI-driven Bioinformatics                     | 3         | 0 | 0 | 0 | 3 |
| 2                          | 102         | Mathematics for Computer Science             | 3         | 0 | 1 | 0 | 4 |
| 3                          | 103         | Basics of Electrical and Digital Electronics | 3         | 0 | 1 | 0 | 4 |
| 4                          | 104         | Fundamental of Cyber Security                | 3         | 0 | 0 | 0 | 3 |
| 5                          | 105         | Programming for Problem Solving              | 3         | 0 | 1 | 0 | 4 |
| 6                          | 106         | YOGA                                         | 1         | 0 | 0 | 0 | 1 |
| 7                          | 107         | Aptitude Skills                              | 0         | 0 | 1 | 0 | 1 |
| <b>Total Credits</b>       |             |                                              | <b>20</b> |   |   |   |   |

| Second Semester B. Tech CSE |             |                                               |           |   |   |   |   |
|-----------------------------|-------------|-----------------------------------------------|-----------|---|---|---|---|
| Sl.No.                      | Course Code | Course Title                                  | L         | T | P | S | C |
| 1                           | 201         | Basics of Intelligent Quantum Computing       | 3         | 0 | 0 | 0 | 3 |
| 2                           | 202         | Probability and Statistics                    | 3         | 1 | 0 | 0 | 4 |
| 3                           | 203         | Discrete Structure                            | 3         | 0 | 0 | 0 | 3 |
| 4                           | 204         | Engineering Design and Prototyping            | 3         | 0 | 1 | 0 | 4 |
| 5                           | 205         | Object-Oriented Programming                   | 3         | 0 | 1 | 0 | 4 |
| 6                           | 206         | Science and Engineering for Sustainable World | 0         | 0 | 2 | 0 | 1 |
| 7                           | 207         | Applied Aptitude Skills                       | 1         | 0 | 0 | 0 | 1 |
| <b>Total Credits</b>        |             |                                               | <b>20</b> |   |   |   |   |

| Third Semester B. Tech CSE |             |                                            |           |   |   |   |   |
|----------------------------|-------------|--------------------------------------------|-----------|---|---|---|---|
| Sl.No.                     | Course Code | Course Title                               | L         | T | P | S | C |
| 1                          | 301         | Database Management System                 | 3         | 0 | 1 | 0 | 4 |
| 2                          | 302         | Data Structures                            | 3         | 0 | 1 | 0 | 4 |
| 3                          | 303         | Operating System                           | 3         | 0 | 0 | 0 | 3 |
| 4                          | 304         | Computer Organization and Architecture     | 3         | 0 | 0 | 0 | 3 |
| 5                          | 305         | Python Programming                         | 1         | 0 | 1 | 0 | 2 |
| 6                          | 306         | Design Thinking                            | 1         | 0 | 0 | 0 | 1 |
| 7                          | 307         | Programming Skills with Computational Math | 0         | 0 | 2 | 0 | 2 |
| 8                          | 308         | Advanced Aptitude Skills                   | 1         | 0 | 0 | 0 | 1 |
| <b>Total Credits</b>       |             |                                            | <b>20</b> |   |   |   |   |

| Fourth Semester B. Tech CSE |             |                                                 |           |   |   |   |   |
|-----------------------------|-------------|-------------------------------------------------|-----------|---|---|---|---|
| Sl.No.                      | Course Code | Course Title                                    | L         | T | P | S | C |
| 1                           | 401         | Machine Learning                                | 3         | 0 | 1 | 0 | 4 |
| 2                           | 402         | Design and Analysis of Algorithm                | 3         | 0 | 1 | 0 | 4 |
| 3                           | 403         | Data Communication and Networking               | 3         | 0 | 1 | 0 | 4 |
| 4                           | 404         | Theory of Computation / Minor Course-I          | 3         | 0 | 0 | 0 | 3 |
| 5                           | 405         | Understanding Harmony and Ethical Human Conduct | 1         | 0 | 0 | 0 | 1 |
| 6                           | 406         | Programming Skills with Data Structures         | 0         | 0 | 2 | 0 | 2 |
| 7                           | 407         | Aptitude Proficiency                            | 0         | 0 | 2 | 0 | 2 |
| <b>Total Credits</b>        |             |                                                 | <b>20</b> |   |   |   |   |

| Fifth Semester B. Tech CSE |             |                                                  |           |   |   |   |   |
|----------------------------|-------------|--------------------------------------------------|-----------|---|---|---|---|
| Sl.No.                     | Course Code | Course Title                                     | L         | T | P | S | C |
| 1                          | 501         | Problem-Driven Programming                       | 3         | 0 | 1 | 0 | 4 |
| 2                          | 502         | Deep Learning                                    | 3         | 0 | 1 | 0 | 4 |
| 3                          | 503         | Java Programming / Minor Course-II               | 3         | 0 | 1 | 0 | 4 |
| 4                          | 504         | Open Elective-I                                  | 3         | 0 | 0 | 0 | 3 |
| 5                          | 505         | Summer Internship-I                              | 1         | 0 | 0 | 0 | 1 |
| 6                          | 506         | Programming Skills with Advanced Data Structures | 0         | 0 | 2 | 0 | 2 |
| 7                          | 507         | Soft Skills & Aptitude Readiness                 | 0         | 0 | 2 | 0 | 2 |
| <b>Total Credits</b>       |             |                                                  | <b>20</b> |   |   |   |   |

| Sixth Semester B. Tech CSE |             |                                                     |           |   |   |   |   |
|----------------------------|-------------|-----------------------------------------------------|-----------|---|---|---|---|
| Sl.No.                     | Course Code | Course Title                                        | L         | T | P | S | C |
| 1                          | 601         | Web Technology                                      | 3         | 0 | 1 | 0 | 4 |
| 2                          | 602         | Software Engineering                                | 3         | 0 | 1 | 0 | 4 |
| 3                          | 603         | Compiler Design / Minor Course-III                  | 3         | 0 | 1 | 0 | 4 |
| 4                          | 604         | Open Elective-II                                    | 3         | 0 | 0 | 0 | 3 |
| 5                          | 605         | Programming Skills with Advanced Algorithmic Design | 0         | 0 | 3 | 0 | 3 |
| 6                          | 606         | Professional Readiness                              | 0         | 0 | 2 | 0 | 2 |
| <b>Total Credits</b>       |             |                                                     | <b>20</b> |   |   |   |   |

| Seventh Semester B. Tech CSE |             |                                      |           |   |   |   |   |
|------------------------------|-------------|--------------------------------------|-----------|---|---|---|---|
| Sl.No.                       | Course Code | Course Title                         | L         | T | P | S | C |
| 1                            | 701         | Research Methodology & IPR           | 3         | 0 | 1 | 0 | 4 |
| 2                            | 702         | Generative AI and Prompt Engineering | 3         | 0 | 1 | 0 | 4 |
| 3                            | 703         | Data Mining / Minor Course-IV        | 3         | 0 | 1 | 0 | 4 |
| 4                            | 704         | Summer Internship                    | 0         | 0 | 0 | 2 | 2 |
| 5                            | 705         | Capstone Project Phase-I             | 0         | 0 | 0 | 6 | 6 |
| <b>Total Credits</b>         |             |                                      | <b>20</b> |   |   |   |   |

| Eighth Semester B. Tech CSE  |             |                               |            |   |   |    |    |
|------------------------------|-------------|-------------------------------|------------|---|---|----|----|
| Sl.No.                       | Course Code | Course Title                  | L          | T | P | S  | C  |
| 1                            | 801         | Skilling / MOOC Certification | 0          | 0 | 0 | 2  | 2  |
| 2                            | 802         | Capstone Project Phase-II     | 0          | 0 | 0 | 14 | 14 |
| 3                            | 803         | Industrial Internship         | 0          | 0 | 0 | 4  | 4  |
| <b>Total Credits</b>         |             |                               | <b>20</b>  |   |   |    |    |
| <b>Total Program Credits</b> |             |                               | <b>160</b> |   |   |    |    |

## Open Electives Offered Across Galgotias University

| <b>Open Elective-I</b> |             |                                               |   |   |   |   |   |
|------------------------|-------------|-----------------------------------------------|---|---|---|---|---|
| Sl.No.                 | Course Code | Course Title                                  | L | T | P | S | C |
| 1                      | 504         | Mechanisms Design for Automation and Robotics | 3 | 0 | 0 | 0 | 3 |
| 2                      | 504         | Digital Signal Processing                     | 3 | 0 | 0 | 0 | 3 |
| 3                      | 504         | General Principles of IPR                     | 3 | 0 | 0 | 0 | 3 |
| 4                      | 504         | Operational Research                          | 3 | 0 | 0 | 0 | 3 |
| 5                      | 504         | Nano Science and Nano Technology              | 3 | 0 | 0 | 0 | 3 |
| 6                      | 504         | Microprocessor and Microcontroller            | 3 | 0 | 0 | 0 | 3 |
| 7                      | 504         | Numerical Methods                             | 3 | 0 | 0 | 0 | 3 |
| 8                      | 504         | Indian Literature                             | 3 | 0 | 0 | 0 | 3 |
| 9                      | 504         | System Design                                 | 3 | 0 | 0 | 0 | 3 |
| 10                     | 504         | iOS App Design and Development                | 3 | 0 | 0 | 0 | 3 |
| 11                     | 504         | Fundamental of Drones                         | 3 | 0 | 0 | 0 | 3 |

| <b>Open Elective-II</b> |             |                                |   |   |   |   |   |
|-------------------------|-------------|--------------------------------|---|---|---|---|---|
| Sl.No.                  | Course Code | Course Title                   | L | T | P | S | C |
| 1                       | 604         | Accounting and Taxation        | 3 | 0 | 0 | 0 | 3 |
| 2                       | 604         | Civil Infrastructure           | 3 | 0 | 0 | 0 | 3 |
| 3                       | 604         | Quantum Computing              | 3 | 0 | 0 | 0 | 3 |
| 4                       | 604         | Advanced Numerical Methods     | 3 | 0 | 0 | 0 | 3 |
| 5                       | 604         | Digital Image Processing       | 3 | 0 | 0 | 0 | 3 |
| 6                       | 604         | Advanced Computer Architecture | 3 | 0 | 0 | 0 | 3 |
| 7                       | 604         | Secure Software Engineering    | 3 | 0 | 0 | 0 | 3 |
| 8                       | 604         | Distributed Computing          | 3 | 0 | 0 | 0 | 3 |
| 9                       | 604         | Cyber Law and IT Act           | 3 | 0 | 0 | 0 | 3 |

### Minors Offered by Department of CSE

| <b>Minor in Quantum Computing</b> |             |                                             |           |   |   |   |   |
|-----------------------------------|-------------|---------------------------------------------|-----------|---|---|---|---|
| Sl.No.                            | Course Code | Course Title                                | L         | T | P | S | C |
| 1                                 | 404         | Foundations of Quantum Computing            | 3         | 0 | 0 | 0 | 3 |
| 2                                 | 503         | Quantum Algorithms and Quantum Information  | 3         | 0 | 1 | 0 | 4 |
| 3                                 | 603         | Quantum Communications and Quantum Hardware | 3         | 0 | 1 | 0 | 4 |
| 4                                 | 703         | Quantum Search and Optimization Techniques  | 3         | 0 | 1 | 0 | 4 |
| <b>Total Minor Credits</b>        |             |                                             | <b>15</b> |   |   |   |   |

| <b>Minor in Full Stack Development</b> |             |                                           |           |   |   |   |   |
|----------------------------------------|-------------|-------------------------------------------|-----------|---|---|---|---|
| Sl.No.                                 | Course Code | Course Title                              | L         | T | P | S | C |
| 1                                      | 404         | Web Development using Django              | 2         | 0 | 1 | 0 | 3 |
| 2                                      | 503         | Mobile Application Development            | 3         | 0 | 1 | 0 | 4 |
| 3                                      | 603         | Full Stack Development with Generative AI | 3         | 0 | 1 | 0 | 4 |
| 4                                      | 703         | DevOps & Cloud Computing                  | 3         | 0 | 1 | 0 | 4 |
| <b>Total Minor Credits</b>             |             |                                           | <b>15</b> |   |   |   |   |

| <b>Minor in Cloud Computing and Artificial Intelligence</b> |                    |                                                  |           |          |          |          |          |
|-------------------------------------------------------------|--------------------|--------------------------------------------------|-----------|----------|----------|----------|----------|
| <b>Sl.No.</b>                                               | <b>Course Code</b> | <b>Course Title</b>                              | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>C</b> |
| 1                                                           | 404                | High-Performance Computing                       | 2         | 0        | 1        | 0        | 3        |
| 2                                                           | 503                | AI and Scalable Computing Architectures          | 3         | 0        | 1        | 0        | 4        |
| 3                                                           | 603                | AI-Driven Cloud Applications                     | 3         | 0        | 1        | 0        | 4        |
| 4                                                           | 703                | Intelligent Internet of Things (IIoT) with Cloud | 3         | 0        | 1        | 0        | 4        |
| <b>Total Minor Credits</b>                                  |                    |                                                  | <b>15</b> |          |          |          |          |

| <b>Minor in Gaming Technology</b> |                    |                                     |           |          |          |          |          |
|-----------------------------------|--------------------|-------------------------------------|-----------|----------|----------|----------|----------|
| <b>Sl.No.</b>                     | <b>Course Code</b> | <b>Course Title</b>                 | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>C</b> |
| 1                                 | 404                | Unity with C#                       | 2         | 0        | 1        | 0        | 3        |
| 2                                 | 503                | Algorithm for Gaming Development    | 3         | 0        | 1        | 0        | 4        |
| 3                                 | 603                | Augmented Reality / Virtual Reality | 3         | 0        | 1        | 0        | 4        |
| 4                                 | 703                | 2D and 3D Animation                 | 3         | 0        | 1        | 0        | 4        |
| <b>Total Minor Credits</b>        |                    |                                     | <b>15</b> |          |          |          |          |

| <b>Minor in Core CSE (For Non-CSE Programs / CSE Specialization Programs)</b> |                    |                       |           |          |          |          |          |
|-------------------------------------------------------------------------------|--------------------|-----------------------|-----------|----------|----------|----------|----------|
| <b>Sl.No.</b>                                                                 | <b>Course Code</b> | <b>Course Title</b>   | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>C</b> |
| 1                                                                             | 404                | Theory of Computation | 3         | 0        | 0        | 0        | 3        |
| 2                                                                             | 503                | Java Programming      | 3         | 0        | 1        | 0        | 4        |
| 3                                                                             | 603                | Compiler Design       | 3         | 0        | 1        | 0        | 4        |
| 4                                                                             | 703                | Data Mining           | 3         | 0        | 1        | 0        | 4        |
| <b>Total Minor Credits</b>                                                    |                    |                       | <b>15</b> |          |          |          |          |