

# Computer Engineering Syllabus Semester - 4

Topics : [Computer engineering](#)

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1. **Computer Architecture:** This course focuses on advanced topics in computer architecture, including advanced pipelining techniques, superscalar processors, out-of-order execution, speculative execution, multi-core processors, and cache coherence protocols.
2. **Advanced Data Structures and Algorithms:** Building on the foundational concepts covered earlier, this course explores advanced data structures (e.g., AVL trees, B-trees, heaps, hash tables) and algorithm design techniques (e.g., graph algorithms, dynamic programming, randomized algorithms).
3. **Computer Networks:** This course delves deeper into advanced topics in computer networks, such as network congestion control, quality of service (QoS) provisioning, network security protocols, network management, and emerging networking technologies.
4. **Operating Systems:** Building on the previous semester, this course covers advanced topics in operating systems, including distributed operating systems, real-time operating systems, fault tolerance, virtualization, and operating system security.
5. **Software Engineering:** This course explores advanced topics in software engineering, such as software architecture and design patterns, software reuse, component-based software engineering, software metrics, and software evolution and maintenance.
6. **Compiler Design:** This course covers the principles and techniques of compiler design, including lexical analysis, syntax analysis, semantic analysis, intermediate code generation, optimization, and code generation. Students learn how to design and implement compilers for programming languages.
7. **Computer Security:** This course focuses on the principles and practices of computer security, including cryptography, authentication, access control, secure software development, network security, and security policies and regulations.
8. **Embedded Systems Design:** Building on the basics covered in the previous semester, this course covers advanced topics in embedded systems design, such as real-time operating systems, embedded system debugging and testing, power-aware computing, and embedded

system security.

9. **Artificial Intelligence:** This course introduces the principles and techniques of artificial intelligence, including knowledge representation, search algorithms, machine learning, natural language processing, expert systems, and intelligent agents.
10. **Elective Courses:** Students may have the option to choose elective courses based on their interests and career goals. Elective courses may include topics such as machine learning, data mining, computer vision, parallel and distributed computing, and advanced topics in computer engineering.
11. **Computer Laboratory-IV:** This course provides hands-on experience with advanced software tools, technologies, and platforms relevant to computer engineering. Students work on laboratory exercises, projects, and assignments to reinforce theoretical concepts and gain practical skills in software development and system administration.
12. **Project Work (Major Project Implementation):** Students continue to work on their major project, implementing the proposed solution, conducting experiments, collecting data, analyzing results, and documenting the project outcomes. The project culminates in a final project report and presentation.