Department of Computer Science and Technology

KEAN UNIVERSITY

M.S. in Computer Science

Program Description

The Master of Science in Computer Science provides a strong foundation in advanced computing principles, algorithms, and system design, preparing students with the analytical and technical skills to solve complex computing challenges. Students gain expertise in key areas such as software engineering, artificial intelligence, data science, cybersecurity, and computer systems. The program provides hands-on experience in designing, developing, and optimizing computing technologies while strengthening analytical thinking skills. Graduates are prepared for leadership roles in academia, industry, government, and the technology sector, with opportunities to engage in research and independent projects across various areas of computer science.

Prerequisites

In addition to the University's admission requirements, applicants should have a bachelor's degree in Computer Science, Information Technology, Artificial Intelligence, Computer Engineering, or a related computing discipline. Additionally, applicants should have prior coursework or demonstrated proficiency in Data Structures, Computer Systems, Algorithm Analysis, Discrete Mathematics, and Calculus. Proficiency in programming languages such as Java, Python, C++, or an equivalent is also required.

Students who do not meet admission requirements or prerequisites may receive conditional admission and must complete bridge courses that do not apply to the 30-credit degree requirement, as determined by the Graduate Program Coordinator.

Degree Requirements

Students must complete 30 credits, which can be fulfilled by taking 10 courses.

Core Courses (9 credits)

These courses provide a core foundation in computer systems, software development, and algorithmic analysis.

CORE COURSES – 9 CREDITS		
CPS 5520	Computer Systems and Concepts	3 credits
CPS 5301	Advanced Software Engineering	3 credits
CPS 5440	Advanced Analysis of Algorithms	3 credits

Elective Courses (18 credits)

Students can select up to 18 credits from various specialized areas based on their interests.

ELECTIVE COURSES – 18 CREDITS		
CPS 5250	Computing, Ethics, and Society Foundations	3 credits
CPS 5498	Digital Forensics and Investigation	3 credits
CPS 5500	Web Design and Development	3 credits
CPS 5601	Human-Computer Interaction	3 credits
CPS 5721	Knowledge Discovery and Data Mining	3 credits
CPS 5740	Database Systems	3 credits
CPS 5745	Interactive Information Visualization	3 credits
CPS 5801	Advanced Artificial Intelligence	3 credits
CPS 5802	Machine Learning Innovations	3 credits
CPS 5881/2/3	Independent Graduate Study	3 credits
CPS 5930	Operating System Concepts	3 credits
CPS 5931	Network Systems	3 credits
CPS 5965	High Performance Computing	3 credits
CPS 5980	Computer and Network Security	3 credits
CPS 5981	Software Assurance	3 credits
CPS 5990	Special Topics in Computer Science	3 credits

Students interested in research may take one Independent Study (CPS 5881/2/3) which may count toward the degree.

Master's Project or Master's Thesis (3 credits)

Students must complete a Master's Project (CPS 5995) or Master's Thesis (CPS 5961) to fulfill degree requirements.

PROJECT or THESIS COURSES – 3 CREDITS		
CPS 5961	Master's Thesis Research	3 credits
CPS 5995	Master's Project	3 credits

Registration and Requirements

- Master's Project (CPS 5995): Involves applying knowledge to a practical computing problem under the guidance of the course instructor. Students must complete at least 9 credits and maintain good academic standing. Approval from the Graduate Program Coordinator is required.
- Master's Thesis (CPS 5961): Involves independent research under the guidance of a faculty research advisor. Students must complete either (a) a sequence of Independent Study and Master's Thesis courses, or (b) two Master's Thesis courses. Approval from a faculty research advisor and the Graduate Program Coordinator is required.

Thesis Requirements

- A Master's Thesis Committee must consist of three members, including the thesis advisor as chair, and at least one other department faculty member.
- A written thesis must be submitted, adhering to the style, formatting, and template guidelines set by the department.
- A public presentation of the thesis is required and must be completed before the end of the semester.
- Committee approval requires thesis submission, a public presentation, and final approval from the Graduate Program Coordinator.

Bridge Courses

Students who do not meet the University's admission requirements or prerequisite coursework may be granted conditional admission, as determined by the Graduate Program Coordinator. In such cases, they must complete assigned bridge courses, which do not count toward the 30-credit degree requirement.

BRIDGE COURSES		
CPS 5010	Fundamentals of Computer Science for Graduate Program	3 credits
CPS 5011	Computer Organization and Programing for Graduate Program	3 credits
CPS 5012	Data Structure for Graduate Program	3 credits
CPS 5013	Computer Systems for Graduate Program	3 credits
CPS 5014	Algorithm Analysis for Graduate Program	3 credits
CPS 5015	Computer Security for Graduate Program	3 credits

Graduate Program Coordinator

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