

COMPUTER SCIENCE - M.S.

College of Arts and Sciences
 Department of Computer Science
www.kent.edu/cs

About This Program

The Master of Science in Computer Science program provides a comprehensive curriculum that covers a wide range of computer science topics, including software engineering, data science, and cybersecurity. With a focus on research and real-world experience, you'll be well-prepared to tackle complex tech challenges and advance your career. [Read more...](#)

Contact Information

- Program Coordinator: **Hassan Peyravi** | gradinfo@cs.kent.edu | 330-672-9047
- Connect with an Admissions Counselor: U.S. Student | International Student

Program Delivery

- **Delivery:**
 - In person
- **Location:**
 - Kent Campus

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements

- Bachelor's degree from an accredited college or university
- Minimum 3.000 undergraduate GPA on a 4.000 point scale
- Core components of an undergraduate computer science curriculum¹
- Official transcript(s)
- GRE scores
- Résumé
- Goal statement
- Three letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
 - Minimum 525 TOEFL PBT score (paper-based version)
 - Minimum 71 TOEFL IBT score (Internet-based version)
 - Minimum 74 MELAB score
 - Minimum 6.0 IELTS score
 - Minimum 50 PTE score
 - Minimum 100 Duolingo English Test score

For more information about graduate admissions, please visit the Graduate Studies admission website. For more information on international admission, visit the Office of Global Education's admission website.

¹ Prospective students must successfully have completed high-level algebra, geometry and calculus coursework (equivalent to the following Kent State courses: MATH 12002, MATH 12003, and MATH 21001). In addition, it is strongly recommended that students successfully have completed coursework in computer science, including programming, data structures, abstraction, operating systems, combinatorial analysis and discrete structures, (equivalent to the following Kent State courses: CS 13001, CS 23001, CS 23022, CS 33211, CS 35101, and CS 46101). Highly qualified students lacking preparation in certain standards areas may be admitted.

Application Deadlines

- **Fall Semester**
 - Application deadline: June 15
- **Spring Semester**
 - Application deadline: November 1
- **Summer Term**
 - Application deadline: April 1

Applications submitted after this deadline will be considered on a space-available basis.

Program Requirements

Major Requirements

| Code | Title | Credit Hours |
|---|-------------------------------------|--------------|
| Major Requirements | | |
| CS 69191 | MASTER'S SEMINAR | 2 |
| Core Courses, choose one course each from four out of the five categories: ¹ | | 12 |
| <i>Computational Data Science Category</i> | | |
| See courses under Computational Data Science concentration | | |
| <i>Computer Engineering Category</i> | | |
| See courses under Computer Engineering concentration | | |
| <i>Computer Security Category</i> | | |
| See courses under Computer Security concentration | | |
| <i>Software and Application Category</i> | | |
| CS 57201 | HUMAN COMPUTER INTERACTION | |
| CS 63005 | ADVANCED DATABASE SYSTEMS DESIGN | |
| CS 63100 | COMPUTATIONAL HEALTH INFORMATICS | |
| CS 63901 | SOFTWARE ENGINEERING METHODOLOGIES | |
| CS 63902 | SOFTWARE EVOLUTION | |
| CS 64401 | IMAGE PROCESSING | |
| CS 64402 | MULTIMEDIA SYSTEMS AND BIOMETRICS | |
| CS 67101 | ADVANCED COMPUTER GRAPHICS | |
| CS 67301 | SCIENTIFIC VISUALIZATION | |
| CS 67302 | INFORMATION VISUALIZATION | |
| <i>Theory and Algorithms Category</i> | | |
| CS 63301 | PARALLEL AND DISTRIBUTED COMPUTING | |
| CS 64201 | ADVANCED ARTIFICIAL INTELLIGENCE | |
| CS 64301 | PATTERN RECOGNITION PRINCIPLES | |
| CS 66101 | ADVANCED TOPICS IN ALGORITHMS | |
| CS 66105 | PARALLEL AND DISTRIBUTED ALGORITHMS | |
| CS 66110 | COMPUTATIONAL GEOMETRY | |
| Culminating Requirement, choose from the following: | | 6 |

| | | |
|--|--|-----------|
| CS 69099 | CAPSTONE PROJECT (taken twice) | |
| CS 69099 & CS 69192 | CAPSTONE PROJECT and GRADUATE INTERNSHIP ² | |
| CS 69199 | THESIS I ³ | |
| Additional Requirements or Concentrations | | |
| Choose from the following: | | 12 |
| Additional Requirements for Students Not Declaring a Concentration | | |
| Computational Data Science Concentration | | |
| Computer Engineering Concentration | | |
| Computer Security Concentration | | |
| Minimum Total Credit Hours: | | 32 |

Additional Requirements for Students Not Declaring a Concentration

| Code | Title | Credit Hours |
|------------------------------------|-------|--------------|
| Major Requirements | | |
| Computer Science (CS) Electives | | 12 |
| Minimum Total Credit Hours: | | 12 |

Computational Data Science Concentration Requirements

| Code | Title | Credit Hours |
|---|---|--------------|
| Concentration Requirements | | |
| Concentration Electives, choose from the following: | | 12 |
| CS 54001 | COMPUTER SCIENCE III - PROGRAMMING PATTERNS | |
| CS 54201 | ARTIFICIAL INTELLIGENCE | |
| CS 54202 | MACHINE LEARNING AND DEEP LEARNING | |
| CS 63005 | ADVANCED DATABASE SYSTEMS DESIGN | |
| CS 63015 | DATA MINING TECHNIQUES | |
| CS 63016 | BIG DATA ANALYTICS | |
| CS 63017 | BIG DATA MANAGEMENT | |
| CS 63018 | PROBABILISTIC DATA MANAGEMENT | |
| Minimum Total Credit Hours: | | 12 |

Computer Engineering Concentration Requirements

| Code | Title | Credit Hours |
|---|--|--------------|
| Concentration Requirements | | |
| Concentration Electives, choose from the following: | | 12 |
| CS 53301 | SOFTWARE DEVELOPMENT FOR ROBOTICS | |
| CS 53302 | ALGORITHMIC ROBOTICS | |
| CS 53303 | INTERNET OF THINGS | |
| CS 53305 | ADVANCED DIGITAL DESIGN | |
| CS 53334 | HUMAN-ROBOT INTERACTION | |
| CS 63201 | ADVANCED OPERATING SYSTEMS | |
| CS 63304 | CLUSTER COMPUTING | |
| CS 63305 | MULTICORE COMPUTING | |
| CS 63306 | EMBEDDED COMPUTING | |
| CS 65101 | ADVANCED COMPUTER ARCHITECTURE | |
| CS 65202 | ADVANCED COMMUNICATION NETWORKS | |
| CS 65203 | WIRELESS AND MOBILE COMMUNICATION NETWORKS | |

| | | |
|------------------------------------|--|-----------|
| CS 65301 | SYSTEM MODELING AND PERFORMANCE EVALUATION | |
| Minimum Total Credit Hours: | | 12 |

Computer Security Concentration Requirements

| Code | Title | Credit Hours |
|---|----------------------------|--------------|
| Concentration Requirements | | |
| Concentration Electives, choose from the following: | | 12 |
| CS 53202 | SYSTEMS ADMINISTRATION | |
| CS 53203 | SYSTEMS PROGRAMMING | |
| CS 55203 | COMPUTER NETWORK SECURITY | |
| CS 57205 | INFORMATION SECURITY | |
| CS 57206 | DATA SECURITY AND PRIVACY | |
| CS 57207 | DIGITAL FORENSICS | |
| CS 57221 | INTRODUCTION TO CRYPTOLOGY | |
| Minimum Total Credit Hours: | | 12 |

- ¹ Courses taken for the core cannot be counted again as an elective or concentration course. The list of courses offered each semester, including department-approved special topics, is available in the department's graduate office.
- ² Students may complete a capstone-related elective course in place of an internship with approval from the graduate coordinator.
- ³ Students selecting the thesis option must form a master's thesis committee, which will include the advisor and at least two other graduate faculty members. The thesis topic and committee must be approved by the advisor and graduate coordinator. The final version of the thesis must be approved by the advisor, thesis committee and graduate coordinator.

Graduation Requirements

- Maximum 12 credit hours of 50000-level courses may be applied toward the degree.

Program Learning Outcomes

Graduates of this program will be able to:

1. Demonstrate breadth-of-knowledge and understanding of essential facts, concepts, principles and theories relating to advanced topics in computer science.
2. Conduct literature searches, comprehend advanced research materials and uncover connections between related work and critical evaluation and synthesis.
3. Perform research, discovery and integration by applying advanced knowledge of computer science.

Full Description

The Master of Science degree in Computer Science provides students with an educational and research environment to develop career paths through necessary training with emerging technologies. Graduates have the technical knowledge and skills necessary for success within the information and high technology industries.

The M.S. degree in Computer Science has two culminating options: thesis or non-thesis. Students planning to pursue a Ph.D. degree an/or academic research should select the thesis option. Students planning to pursue applied research and development in industry may select the non-

thesis option. The thesis option requires original research and a written thesis. The non-thesis option requires a capstone project and an optional industrial internship.

The Computer Science major includes the following optional concentrations:

- The **Computational Data Science** concentration prepares students to process big data. In a spectrum of real-world applications, the collected data (from such sources as mobile devices, GPS, sensor/RFID networks, Internet, social media, etc.) is so large and complex, the traditional data processing tools cannot efficiently and effectively handle it. This concentration focuses on algorithms development, machine learning, computation techniques, network and computing infrastructure and software.
- The **Computer Engineering** concentration prepares students to meet the need of computer engineering professionals in the industry for designing and managing emerging smart devices and computer-integrated physical systems with programmable intelligence. Students learn the hardware-software co-design principles and theory, architecture of the associated software and hardware, devices and sensors communication protocols and the interfaces to effectively design, build and evolve such smart devices and computer-driven intelligent physical systems.
- The **Computer Security** concentration exposes students to a wide range of topics on the security of computer systems. Students study the vulnerabilities in software and networks and develop algorithms and software to protect data, using digital encryption coding, protected databases and protected computer networking techniques.

Students opting to not pursue a concentration will create a 12-credit hour individualized plan of study with their advisor.