

Application

Applications for Master of Science in Computer Science are considered for fall, winter, and spring quarters. All application materials should be sent to Graduate Admissions by the stated deadline for that quarter. Late applicants can only be considered as non-matriculating students and on a space available basis.

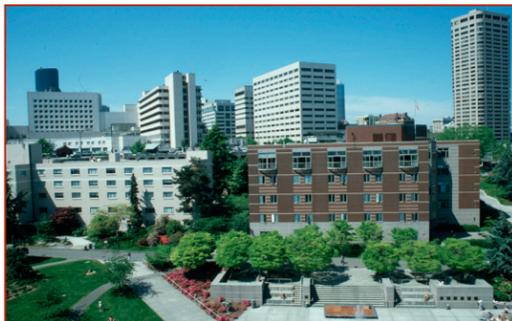
Application Deadlines

Quarter	Fall	Winter	Spring
Domestic	July 20	Nov 20	Feb 20
International	April 1	Sept 1	Dec 1

Application Procedure

- Obtain a complete application packet from Graduate Admissions or our website.
- Have an official transcript from each institution you have attended mailed directly to Graduate Admissions.
- Complete the Master of Science in Computer Science applicant information form.
- Distribute the provided recommendation forms and envelopes to two individuals who will serve as academic or professional references.
- Complete the 1-2 page letter of intent describing the relevance of your experiences to the MSCS program and your objectives in completing the program.
- Request that official GRE scores be sent directly to Graduate Admissions.

Submit all application materials to Seattle University Graduate Admissions.



Degree Requirements

Minimum requirements for the degree are 47 graduate credits. A maximum of 12 credits taken in non-matriculated status may be applied to this program. Students are allowed up to 10 transfer credits. All degree requirements must be completed within six years after course work has begun.

Courses

I. Preparatory Courses

Students must take the following three preparatory courses
 CPSC 5010 Software Design and Engineering
 CPSC 5020 Computing System Principles
 CPSC 5030 Fundamentals of Algorithms and Analysis
 Students can be waived from one or more of these courses if they have prior equivalent coursework.

II. Required Courses

15 Credits Including:
 CPSC 5200 Software System Design.....4 credits
 CPSC 5500 Computing Systems.....4 credits
 CPSC 58000 Ethics in Computing2 credits
 Choose one of the following two applied algorithms courses
 CPSC 5600 Parallel Computing.....5 credits
 CPSC 5610 Artificial Intelligence.....5 credits

III. Breadth Electives

20 Credits from the following:
 CPSC 5210 Software Testing & Debugging5 credits
 CPSC 5230 Design Patterns & Refactoring5 credits
 CPSC 5300 Database Design & Optimization.5 credits
 CPSC 5400 Compiler Principles & Techniques5 credits
 CPSC 5510 Computer Networks.....5 credits
 CPSC 5520 Distributed Systems.....5 credits
 CPSC 5530 Embedded Systems.....5 credits
 CPSC 5600 Parallel Computing.....5 credits
 CPSC 5610 Artificial Intelligence.....5 credits
 CPSC 5700 Computer Graphics.....5 credits
 CPSC 5710 Security in Computing5 credits
 CPSC 5910 Special Topics5 credits

III. Graduate Project

9 credits:
 CPSC 5990 Graduate Project.....9 credits

The MSCS project consisting of 9 credits carried out in either a two or three quarter sequence. The project requires either implementation of a software system or carrying out research within computer science. Satisfactory performance (B- or better) in graduate project is required of all MSCS students.

IV. General Electives

3 credits consisting of one of the courses from the following list:

SEGR 5210 Software Testing3 credits
 SEGR 5220 Human Computer Interaction.....3 credits
 SEGR 5410 Applied Formal Methods.....3 credits
 SEGR 5520 Distributed Computing.....3 credits
 SEGR 5530 Embedded Systems.....3 credits
 SEGR 5610 Artificial Intelligence3 credits
 SEGR 5710 Software Security.....3 credits
 CPSC 5950 Internship.....3 credits
 Note: Students may also take an additional 5 credit MSCS breadth elective to satisfy the general elective requirement

MINIMUM CREDITS REQUIRED FOR DEGREE 47

Typical Program Schedule

Typical full-time program of study

	Fall	Winter	Spring	Summer
Year 1	CPSC 5100 Breadth elective	App. Algorithms Breadth elective	CPSC 5500 Breadth elective	CPSC 5800
Year 2	Graduate Project Breadth elective	Graduate Project General elective		

Typical part-time program of study

	Fall	Winter	Spring	Summer
Year 1	CPSC 5100	App. Algorithms	CPSC 5500	CPSC 5800
Year 2	Breadth elective	Breadth elective	Breadth elective	
Year 3	Breadth elective	Graduate Project General elective	Graduate Project	

Faculty

Richard LeBlanc, PhD, University of Wisconsin, Chair
 Roshanak Roshandel, PhD, University of Southern California
 Adair Dingle, PhD, University of Texas at Dallas
 Eric Larson, PhD, University of Michigan
 Lin Li, PhD, Clemson University
 Yingwu Zhu, PhD, University of Cincinnati
 Jeff Gilles, MS, University of Iowa

Our Adjunct faculty are working industry professionals drawn from many of the corporations in the Seattle area, such as Microsoft and Boeing.

"Seattle University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, marital status, sexual or political orientation, or status as a Vietnam-era or special disabled veteran in the administration of any of its education or admission policies, scholarship and loan programs, athletics, and other school-administered policies and programs, or in its employment policies and practices. All University policies, practices and procedures are administered in a manner consistent with Seattle University's Catholic and Jesuit identity and character. Inquiries about the non-discrimination policy may be directed to the University's EEO Officer and Title IX coordinator, University Services Building 107, (206) 296-5870."



Seattle University

Seattle University was founded in 1891 by Jesuit priests. As one of 28 Jesuit colleges in the United States, we are dedicated to teaching and educating for leadership and service. While we have grown to be the largest independent institution in the Pacific Northwest, we still enjoy a small-college atmosphere that balances academic challenges with personal, individual attention. We offer a diverse and quality curriculum to students of every religion and culture, and our faculty members are committed to a strong student-teacher relationship.

For Additional Information

• MSCS Program:

Department of Computer Science/Software Engineering,
 Seattle University
 901 12th Ave, P.O. Box 222000, EGRN 526,
 Seattle, WA 98122-1090
 206-296-5428, Fax 206-296-5518
 Email: mcs@seattleu.edu
 Web: www.seattleu.edu/computerscience

• Graduate Admissions:

Seattle University
 901 12th Ave, P.O. Box 222000
 Seattle, WA 98122.
 206-296-2000, Fax 206-296-5656.
 Email: grad-admissions@seattleu.edu
 Web: www.seattleu.edu



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Course Descriptions

Computer Science Courses

Eligibility to remain in courses for which students are registered will be based on the criteria listed within each course description and the program admission criteria, and will be determined by the instructor after the first day of class.

CPSC 5200 Software System Design.....4

Design of large complex software systems. Understanding, interacting, and extending legacy systems. Design and analysis of software systems functional and non-functional properties. System integration, middleware technologies, and software quality. Students may not get credit for both CPSC 5200 and SEGR 532.

CPSC 5210 Software Testing and Debugging5

Overview of testing and debugging principles. Topics include program analysis, testing adequacy, functional testing, structural testing, unit testing, integration testing, and systematic debugging. Students may not get credit for both CPSC 5210 and SEGR 5210.

CPSC 5220 Distributed Systems.....5

Distributed systems help programmers aggregate the resource of many networked computers to construct highly available and scalable services. Abstractions, design and implementation techniques used in the construction of scalable, high performance distributed systems. Topics include (but not limited to) multithreading, network programming, consistency, fault tolerance, security and several case studies of distributed systems. Students may not get credit for both CPSC 5220 and SEGR 5220

CPSC 5230 Design Patterns and Refactoring.....5

Categorization of standard design patterns, their use, expected benefits and associated costs. Explication and analysis of creational, interface, structural and behavioral patterns. Use of patterns relative to legacy code, including characteristics of poorly designed code as well as the misapplication of patterns. Examination and application of refactoring, techniques used to modify existing code in order to improve structure or performance.

CPSC 5300 Physical Database Design and Optimization5

Analysis and conversion of a logical data model to a physical model using a range of storage techniques including partitioning, creating new data types, index organized, clustered, multi-dimensional tables, etc. A major focus is query optimization and retrieval strategies used by major commercial database vendors in both transaction processing and dimensional databases. Other topics to be covered will be security, privileges, distributed processing, and transaction control.

CPSC 5400 Compiler Principles and Techniques5

Lexical analyzers, grammars, top-down and bottom-up parsing, symbol tables, internal forms and intermediate languages, code generation, code optimization, semantic specifications, error detection and recovery. Use of software tools and standard architectures for compiler construction.

CPSC 5500 Computing Systems.....4

Graduate-level introduction to operating system designs and implementations as well as operating system support for networking. Concurrent processes, process communication, resource allocation, process scheduling, concurrent programming (threads and synchronization), and an introduction to security and networking. Selected materials will be added as case studies.

CPSC 5510 Computer Networks5

The study of computer networks and the services built on top of them. Topics include packet-switch and multi-access networks, reliable data transfer, routing and multicasting, Internet protocols (IP, TCP, BGP), Internet architecture, the client-server model, network programming, peer-to-peer networks and security.

CPSC 5600 Parallel Computing5

The study of computer networks and the services built on top of them. Topics include packet-switch and multi-access networks, reliable data transfer, routing and multicasting, Internet protocols (IP, TCP, BGP), Internet architecture, the client-server model, network programming, peer-to-peer networks and security.

CPSC 5610 Artificial Intelligence5

Concepts and techniques of artificial intelligence, with an emphasis on building intelligent agents, environments and systems. Methods and tools for building systems that can interact intelligently with their environment by learning and reasoning about the world. Students may not get credit for both CPSC 5610 and SEGR 553.

CPSC 5700 Computer Graphics5

Fundamentals of image representation and computer graphics. Techniques for computer image synthesis, including line drawing, color representation, surface shading, texture mapping, and programming graphics processors.

CPSC 5710 Security in Computing5

Fundamental principles of security with emphasis on various aspects of security related to operating systems, networks, databases, and web applications. Discussion on privacy concerns and social and ethical issues related to security. Students may not get credit for both CPSC 5710 and SEGR 5710.

CPSC 5800 Ethics & Professional Issues2

Examination of the role and impact of information and communication technology in society, with emphasis on ethical, professional, and public policy issues. Prerequisite: Graduate standing in the MSCS program.

CPSC 5990 Graduate Project3 to 5

A project consisting of 9-10 credits carried out in either a two or three quarter sequence. Students can either implement a software system (CPSC 5990) and/or carry out research within computer science (CPSC 587). During the first quarter of the sequence students will study background material, complete a project proposal, and begin working on the project. Students registering for CPSC 587 will be required to write a research paper suitable for publication in a workshop or conference during the final quarter of the project.

CPSC 5910 Special Topics CPSC 5950 Internship CPSC 5960 Independent Study

SEATTLE UNIVERSITY

Master of Science in Computer Science

Overview

The 47 credit Master of Science in Computer Science (MSCS), offered through the College of Science & Engineering, serves both full-time students, who can complete the program in five quarters, and professionals who wish to study part time, who can complete the program in three years.

Computer Science is the study of the theoretical foundations of information and computer system. MSCS graduates will:

- Demonstrate mastery of the core areas of computer sciences, expertise in advanced areas and problem-solving skills essential to becoming competent professionals in the computing industry.
- Develop the ability to apply appropriate computer science fundamentals and practices to design and implement computer software.
- Gain research experience and in-depth knowledge in a chosen area of concentration and demonstrate the ability to understand and evaluate research from computer science literature.
- Demonstrate the ability to convey technical material through both written papers and oral presentations.
- Possess sufficient background to continue their studies toward a PhD in computer science.
- Develop sufficient mathematical and analytical maturity for maintaining professional currency in the rapidly changing field of computer science.

The MSCS program is designed to serve students entering upon completion of their bachelor's degree as well as professionals in the computing field who desire a graduate education.

Our Tradition

Seattle University has long been a leader in computer science and software engineering education. It established its pioneering Master of Software Engineering program in 1979, and awarded the world's first MSE degree in 1982. The MSCS program builds on this substantial experience in graduate education. Our graduate faculty has strong academic credentials and is well connected to the computing industry in the Seattle area.

Our Program

The Master of Computer Science (MSCS) program offers a curriculum based on theoretical foundations and practical applications. The program is designed to provide advanced study in computer science for students with a substantial background in the discipline. Full-time students, registering for two courses per quarter, can complete the program in five quarters. The program also accommodates part-time students who can complete the program in three years.

The curriculum includes three required advanced courses in core areas of computer science. A set of elective courses ensure students develop a solid, broad understanding of computer science. Under the supervision of a faculty member, students are required to complete a project spanning two to three quarters. The project consists of either implementing a software system or carrying out research within computer science. Software implementation projects enhance students' programming skills and provide hands-on experiences in system design and development. Research projects culminate in a report suitable for publication, and provide excellent preparation for those who are pursuing research careers or further education in a doctoral program.

Admission Requirements

- A four-year Bachelor's degree, in computer science or related discipline, earned at a regionally accredited institution. For those without a CS degree, admission may be conditional upon completion of prerequisite courses.
- Minimum GPA of 3.00 calculated with coursework from all post-secondary educational institutions attended in the last 90 quarter/60 semester credits of your bachelor's degree and any post-baccalaureate coursework.
- A 1-2 page letter of intent.
- Two (2) academic or professional recommendations using the MSCS recommendation form.
- Academic Transcripts: All applicants are required to submit one copy of official transcripts from each post-secondary institution attended.
- Graduate Record Examination (GRE): GRE scores on the General (Aptitude) test are required for admission. The test must be taken within the last five (5) years before the desired date of admission.
- English Proficiency Exam: International applicants whose first language is not English must submit TOEFL scores. Applicants are required to receive a minimum passing score of 580 in paper-based test (92 internet-based or 237 computer-based). Equivalent MELAB and IELTS scores are also accepted.

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