



General Graduation Requirements

The general requirements for the Master of Science in Computer Science degree follow:

- A minimum of 30 graduate credits must be completed (See curriculum information that follows.)
- All requirements for the degree must be completed within a seven-year period.
- The standard of work at the graduate level requires that the student earn at least a “B” (3.0 GPA) average on all work taken for the degree.
- Satisfactory completion of the Practicum during the final semester of the student’s program.

Master of Science in Computer Science – The Curriculum

The Master of Science in Computer Science from UWRF was built on the needs of both the business community and our Computer Science students. Graduates with an MSCS will have the ability to effectively compete in this growing CS field. They will have the knowledge to develop solutions in specific and specialized computer science topics. Graduates also will possess the skills required in the management of technology. They will have the expertise to perform effectively as middle managers or above in positions related to MSCS topics.

To earn the master’s degree at UW-River Falls, you will need to complete 8 required Computer Science courses, including an MSCS Practicum, and two graduate Management courses for a total of 30 graduate-level credits.

Required courses include:

- Enterprise and Cloud Computing
- Distributed Mobile Computing
- Information Security
- Computing for Data Science and Big Data Analysis
- Software Engineering and Design Patterns
- Machine Learning and Knowledge Discovery
- Technology Innovation, New Product Development and Sustainability
- MSCS Practicum

Elective curriculum includes (choose 2):

- Organizational Theory and Behavior
- Leadership and Ethics
- Strategic Marketing Management
- Human Resource Management
- Operations and Project Management
- Financial Management



Course Descriptions

CSIS 730 – Enterprise and Cloud Computing (3 credits)

This course provides an advanced-level coverage of concepts in Cloud Computing and the application of these concepts in the setting of an enterprise. Students will learn about the rationale for virtualization and the differences between software as a service (SaaS), platform as a service (PaaS), infrastructure as a service (IaaS) and other cloud services. Students will gain practice solving typical enterprise problems using these cloud computing techniques. The course will cover enterprise information technology requirements and strategies for solving problems at the enterprise level. Topics include: Service Oriented Architecture, System Administration and Total Cost of Ownership, Virtualization, Cloud Computing.

CSIS 731 – Distributed and Mobile Computing

This course will explore theoretical and practical aspects of Distributed and Mobile Computing. It will examine the main issues in mobile software development and the features and limitations of mobile hardware. Students will compare software development approaches for desktop and mobile platforms and gain hands-on experience in writing mobile applications using native application frameworks as well as cross-platform tools. Students will work in teams to undertake one or more mobile application programming projects.

CSIS 732 – Information Security

This course provides an in-depth coverage of concepts in Information Security. Students will learn about security issues related to operating systems, networks and applications. Students will gain practice auditing the security of the information technology infrastructure of an organization. Students will learn about intrusion techniques and tools, forensics, and methods used to handle incidents at the enterprise level. Topics include: operating system and network vulnerabilities, security policies, forensics, investigation, and response techniques.

CSIS 733 – Computing for Data Science and Big Data Analysis

This course provides an advanced coverage of computing techniques used for Data Science and Big Data Analysis. Students will learn fundamental computing skills necessary for effective data analysis. Technologies and techniques for efficient and effective data collection, conversion, analysis, visualization, interpretation, storage and search will be discussed.

CSIS 734 – Software Engineering and Design Patterns

This course provides students with a software architect's view of software projects. Students will learn about the use of design patterns to simplify and reuse code design. Students will gain practice solving typical software construction issues. A significant component of this course is a team software design project. Topics include: requirements analysis, Unified Modeling Language, feasibility analysis, design patterns.



CSIS 735 – Machine Learning and Knowledge Discovery

This course provides advanced coverage of Machine Learning theory, concepts, techniques and their application to Knowledge Discovery and pattern recognition problems. Topics include: Supervised learning (parametric/non-parametric, support vector machines and neural networks), Unsupervised learning (dimensionality reduction, recommender systems and clustering) and best practices in machine learning (bias/variance and model selection).

CSIS 736 – Technology Innovation, New Product Development and Sustainability

This course focuses on developing skills in the creation of new technology-based products and services. Specifically, students will learn how to frame problems, find solutions by applying methods and frameworks of design thinking and innovation, how to identify needs of the market and society, how to create a business plan, how to identify financial resources and how to execute the business plan. This course also incorporates the sustainability perspective in the development of technology solutions.

CSIS 738 – Practicum

This course provides students the opportunity to employ one or more of the concepts developed throughout the graduate program to develop a practical project or explore a new area of research. Students will work with the business community to identify and develop a practical project; or will work with a faculty to identify and work on a research project.



Elective Courses

MNGT 700 – Organizational Theory and Behavior (3 credits)

Organizational Theory and Behavior introduces students to the perspectives developed to understand and evaluate the functioning of complex organizations. Theories of organization from the early 20th Century to the present are presented and evaluated for their explanatory value. In addition, organizational dynamics such as employee motivation, the quality of working life, decision-making, organizational change, and development are discussed and explored.

MNGT 701 – Leadership and Ethics (3 credits)

This course is designed to provide foundational information on leadership and to assist students to enhance leadership competencies in their professional life. The course explores conceptions and theories of leadership, both historical and current, and applies theories through case studies and simulations. Assessment of leadership competencies, practice in utilizing competencies, analyses of leadership challenges, and synthesis of experience and theory all serve to enhance the leadership abilities of students. The ethical aspects and obligations of leadership are emphasized throughout the course.

MKTG 702 – Strategic Marketing Management (3 credits)

This course involves the development of competitive marketing strategy in a dynamic environment to enhance customer value and satisfaction. Case analysis and marketing models are used in the analysis of market opportunity, selection of target markets, and development of marketing plans. Financial, global, ethical and e-commerce perspectives are included.

MNGT 703 – Human Resource Management (3 credits)

This course will cover the human resources functions in the modern business organization. It will emphasize the importance of the human resource department's role in the accomplishment of company objectives. It will provide an in-depth look at the major human resource functions, the strategies and tactics of how those functions are performed and the role and relationship of human resource managers and the rest of the organization. Emphasis will be on the application of the material to real situations that the student will encounter in the organization.

MNGT 705 – Operations Management (3 credits)

This course introduces the concepts and tools that need to be understood in order to produce world-class goods and services. The course consists of three modules; one on general operations management principles (such as operations strategy, logistics, scheduling), one on project management, and one on quality.

FINC 732 – Financial Management (3 credits)

This course covers the modern theory and practice of financial management. Topics covered include: Application of financial ratio analysis, review of the time value of money, basic principles of risk and return, financial forecasting, debt and equity valuation, capital budgeting and cost of capital, capital structure and dividend theory, and firm valuation from a value-based management and corporate governance perspective.