



FACULTY OF GRADUATE STUDIES

# APPLIED COMPUTER SCIENCE AND SOCIETY (MSc)

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The Master of Science (MSc) in Applied Computer Science and Society focuses on issues of technology and the ethical, human, and social aspects of computing. We offer courses in four core clusters that represent frontiers of the discipline: Information Representation, Search and Management, Intelligent Systems, and Systems Development and Social Issues.

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In this program, students have the opportunity to work with outstanding faculty who have a wide range of research interests including: Algorithms and Complexity, Artificial Intelligence, Advanced Machine Learning, Cloud Computing, Complex Adaptive Systems, Digital Agriculture, Digital Forensics, Health Informatics, Image Processing, Internet of Things, Wireless Sensor Networks, Web and Document Databases. Information about specific research topics can be found on the faculty webpages.

We offer both thesis-based and course-based programs. The expected time to graduate is 2 years; the maximum time is 5 years.

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## SAMPLE CAREERS

Our thesis-based program is designed to provide an excellent basis for a PhD in computer science or other related fields. Our graduates in the course-based program are well-qualified for employment in industry, the public-sector, and academia.

## SAMPLE COURSES

**ADVANCED MACHINE LEARNING** - This course covers core machine algorithms, however, emphasis is placed on research-level machine learning methods and theory. Students acquire considerable knowledge in algorithms for classification, clustering, regression and dimensionality reduction. Natural Language Processing and Deep Learning Methods will be explored. Evaluating predictive quality of the algorithms and assessing credibility of learned patterns with statistical methods are covered extensively.

**ADVANCED CONCEPTS IN CLOUD COMPUTING** - This course provides extensive coverage of major subjects in Cloud Computing. It gives an overview of Cloud Computing and explains its main service delivery models, deployment architectures, and key enabling technologies such as virtualization, parallel computing, and Big Data analytics. Students will acquire considerable knowledge in Cloud data and resource management, design patterns, security and privacy challenges and solutions, as well as commercial and open-source Cloud systems.

**THEORY AND PRACTICE OF SECURITY AND PRIVACY** - This course provides students with an understanding of theoretical and practical aspects of security and privacy and opens them up to the

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current research challenges in this area. Topics include classical cryptography, symmetric encryption, public key cryptography, key distribution mechanisms, digital signature, entity and message authentication, access control, multimedia security and digital right management, secret sharing, physical security, privacy preserving techniques such as data aggregation, perturbation, k-anonymity and l-diversity.

## MORE SAMPLE COURSES

- Complex Adaptive Systems
  - Web and Document Databases
  - Advanced Data Structures
  - Image Processing
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## ADMISSION REQUIREMENTS

Students may be admitted if they hold an Honours or 4-year Bachelor of Science degree in Applied Computer Science, Computer Science and/or Engineering, Mathematics or equivalent and if they present a suitable selection of courses. Minimum Entry Requirement: Overall GPA of 3.0. For the thesis track, the student must also have a supervisor selection prior to admission.

**NOTE:** Students applying for the *course-based* track ARE NOT REQUIRED to consult any faculty member to complete their application.

English Requirement (if applicant's first language is not English): Minimum TOEFL score 550 (paper-based), 213 (computer-based), 86 (internet-based) or IELTS score 6.5 or Duolingo 120. The test should have been taken within two years of the date a completed application is filed. See [English Language Requirements](#).

Students may be admitted upon successful completion of a pre-Master's program which consists of a set of upper-level undergraduate courses – for details, see <http://www.acs.uwinnipeg.ca/>

## HOW TO APPLY

1. Please complete the online application form: [uwinnipeg.ca/apply-to-grad-studies](http://uwinnipeg.ca/apply-to-grad-studies)
2. In addition to the completed application form, the following must also be included with the application:
  - a. Transcripts are required from ALL recognized, post-secondary institutions attended, whether or not a degree has been awarded. For initial assessment purposes only, copies of unofficial transcripts uploaded on the online application are acceptable and preferred. Official transcripts will only be required if you are recommended for admission. All official transcripts are to be sent directly from the post-secondary institutions. If the final transcript does not show that a completed degree has been conferred, an official/notarized copy of your diploma is also required.
  - b. Provide contact information for two individuals familiar with your academic work and who will provide letters of recommendation.
  - c. Provide English language requirement (where applicable). Official test scores must be forwarded directly to the Graduate Studies Admissions Office from the testing agency. For initial assessment purposes only, copies of test scores (uploaded to your application) are acceptable and preferred.
  - d. Supply statement of interest and/or research proposal.
  - e. Other supporting documents include: scanned copies of name change (if applicable), CV/ resumé and proof of permanent residency (if applicable).
  - f. Official documents should be sent to the Graduate Studies Admissions Office, The University of Winnipeg, 515 Portage Avenue, Winnipeg, MB Canada R3B 2E9.

**Start dates** for the program are in September and January.

**Deadlines** to submit a complete application package, including all supporting documents: Fall (September) Intake – February 1; Winter (January) Intake – July 1

## CONTACT US

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<http://www.acs.uwinnipeg.ca/>

## Graduate Studies Admissions Office

P: 204.786.9309  
E: [graduatestudies@uwinnipeg.ca](mailto:graduatestudies@uwinnipeg.ca)