

**New Graduate Program (Majors, Sequences, Certificates) Proposal
Illinois State University - Graduate Curriculum Committee**

Program Department School of Information Technology

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Title of New Program M.S. in Computer Science

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Campus Address 5150 School Of Info Technology

Version 5 **ID** 76

Proposed Starting Catalog Year 2020-2021

Associated Course Proposal(s):

New Graduate Course proposal IT 426 titled *Advanced Software Engineering*
 New Graduate Course proposal IT 427 titled *Design and Analysis of Algorithms*
 New Graduate Course proposal IT 428 titled *Fundamental Theory of Computer Science*
 New Graduate Course proposal IT 429 titled *Compiler Design*
 New Graduate Course proposal IT 441 titled *Big Data*
 New Graduate Course proposal IT 443 titled *Information Retrieval and Search Engines*
 New Graduate Course proposal IT 444 titled *Data Analytics and Mining*
 New Graduate Course proposal IT 448 titled *Introduction to Machine Learning*
 New Graduate Course proposal IT 452 titled *Data and Information Visualization*
 New Graduate Course proposal IT 483 titled *Advanced Operating Systems*
 New Graduate Course proposal IT 488 titled *Topics in Computer Science*

1. Proposed Action

- ✓ New Major
- New Sequence
- New Certificate
- More than 50% of courses in this program are Distance Education

Degree Type(s)

Master of Science

2. Provide Graduate Catalog copy for new program.

MAJOR IN MASTER OF SCIENCE IN COMPUTER SCIENCE

Degree offered: M.S.

The Master of Science in Computer Science major is designed to give students the knowledge and tools necessary for studying important current issues in computer science to obtain productive employment or pursue advanced degrees. It emphasizes foundational knowledge in computer science and programmatic application of these fundamental concepts in leading-edge applications. It is appropriate for a range of students, including industry computing professionals seeking career advancement, students wishing to expand on their undergraduate computer science work and/or prepare for doctoral degree, and individuals wishing to make a career change.

This degree requires the student to complete a 33-semester-hour thesis, project, or course option. It assumes an undergraduate knowledge base in computer science, which students with some types of computer-related undergraduate degrees will typically have acquired. Students lacking sufficient background will need to complete fundamental courses before enrolling in the MS Computer Science degree courses.

Students lacking sufficient background should expect to complete some or all of the following courses with a grade of B or better:

- IT 168: Structured Problemsolving Using The Computer
- IT 179: Introduction to Data Structures
- IT 180: C++ Programming
- IT 225: Computer Organization
- IT 279: Algorithms and Data Structures
- IT 383: Principles of Operating Systems
- IT 378: Database Processing

The graduate coordinator will determine specific requirements.

Option I—Thesis: This 33-hour option requires:

- 18-hour core: IT 426, 427, 428, 441, 448, 483.
- 6 hours: IT 499 Master's Thesis
- 9 hours from: IT 340, 356, 358, 382, 388, 429, 443, 444, 452, 467, 478, 488, 497.

Option II—Project: This 33-hour option requires:

- 18-hour core: IT 426, 427, 428, 441, 448, 483.
- 6 hours: IT 494 Master's Project
- 9 hours from: IT 340, 356, 358, 382, 388, 429, 443, 444, 452, 467, 478, 488, 497.

Option III—Courses: This 33-hour option requires:

- 18-hour core: IT 426, 427, 428, 441, 448, 483.
- 15 hours from: IT 340, 356, 358, 382, 388, 429, 443, 444, 452, 467, 478, 488, 497.

3. Provide a description for the proposed program.

The Master of Science in Computer Science (MSCS) program emphasizes foundational knowledge in computer science and programmatic application of these fundamental concepts in leading-edge applications. It is appropriate for a range of students, including industry computing professionals seeking career advancement, students wishing to expand on their undergraduate computer science work and/or prepare for doctoral degree, and individuals wishing to make a career change. Students may pursue a course, thesis, or project option.

4. Provide a rationale of proposed program.

The School of IT does not have a graduate degree in computer science that it can offer to prospective students who wish to further their career or expand their knowledge in the computer science field. Over the years, both domestic and international prospective students have inquired about a MS in Computer Science program at ISU but have been told that not such offering exists. The proposed program fills a void the has existed in the School for many years.

5. Describe the expected effects of the proposed program on existing campus programs (if applicable).

Not applicable.

6. Describe the expected curricular changes required, including new courses. If proposals for new courses that will be or have been submitted, please reference those related proposals here:

A total of eleven new courses are being created as part of this proposal to support the MSCS program. They are:

IT 426: Advanced Software Engineering
IT 427: Design and Analysis of Algorithms
IT 428: Fundamental Theory of Computer Science
IT 429: Compiler Design
IT 441: Big Data
IT 443: Information Retrieval and Search Engine
IT 444: Data Analytics and Mining
IT 448: Introduction to Machine Learning
IT 452: Computer Visualization
IT 483: Advanced Operating Systems
IT 488: Topics in Computer Science

Also, a total of eight existing courses are used as electives in the MSCS program. They are:

IT 340: INTRODUCTION TO ARTIFICIAL INTELLIGENCE
IT 356: INTRODUCTION TO COMPUTER GRAPHICS
IT 358: MOBILE AND CLOUD COMPUTING
IT 382: DISTRIBUTED SYSTEMS
IT 388: INTRODUCTION TO PARALLEL PROCESSING
IT 467: HUMAN FACTORS IN INFORMATION SYSTEMS
IT 478: ADVANCED DATABASE MANAGEMENT
IT 497: INTRODUCTION TO RESEARCH METHODOLOGY

7. Anticipated funding needs and source of funds.

Please see attached Financial Implication form.

8. **No** Does this program count for teacher education?

9. **The following questions must be answered.**

Yes Have you confirmed that Milner Library has sufficient resources for the proposed program?

N.A. Have letter(s) of concurrence from affected departments/schools been obtained?
A departments/school is affected if it has a program with significant overlap or if it teaches a required or elective course in the program.

