GUIDELINES FOR THE MASTER OF SOFTWARE ENGINEERING (MSE) DEGREE
Department of Computing and Information Sciences
Kansas State University
August 2019

Graduate Studies Committee
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I. The Software Engineering Discipline

The discipline of software engineering covers the application of engineering principles to the building of computer software. The field covers the theories, tools and methods for systematic representation, design, verification, development, production, validation, and maintenance of software products including programs, prototypes, documentation, user interfaces, training, and evaluation. Software engineering is applicable not only to computer systems software; the techniques of software engineering offer benefits for software developed for all disciplines.

Engineering is the "practical application of scientific knowledge." The application of knowledge about software is made practical through the use of common techniques, components, tools, and methods of management. Specifically, like other branches of engineering, software engineering:

- Uses formal models and methods of computing to develop formal requirements of and specifications for application domain software
- Uses established techniques of design to establish the structure of software before it is actually programmed
- Uses established techniques for verification (formal analysis of correctness of properties) of system design
- Uses established techniques for validation (systematic measurement and analysis of properties) of systems implementation
- Uses numerous software tools to provide assistance in all activities of software development
- Studies the processes of software development as the basis for systematic management

II. Requirements for MSE Degree

MSE students should have a bachelor's degree in computer science, computer engineering, or a related engineering, math, or science area.

The MSE degree consists of 33 semester credit hours that must include the following:

- CIS 740 - Software Engineering or CIS 744 - Advanced Software Analysis and Design **Credits:** 3
- CIS 748 - Advanced Software Management **Credits:** 3
- CIS 771 - Software Specification **Credits:** 3
- CIS 841 - Verification and Validation or CIS 640 - Software Testing Techniques **Credits:** 3
- CIS 895 - MSE Project **Credits:** 0-6
  Note: Six credit hours total over the degree lifetime are required for CIS 895.

Technical Electives:

Five additional computer science courses (600 level or above) are required. At the 600 level, no more than 3 credits of CIS 690 can be taken. No more than 6 credits of 600 level courses can be taken. Other technical courses may be substituted upon approval of the supervisory committe (15 credits).

Notes:

As part of CIS 895, each student specializes in an application area and does a project related to that application area. Each student will produce and present a "software portfolio" that contains a collection of documents related to the software development activity.

The student must receive a grade of B or better for all classes assigned by the Graduate Studies Committee and for each course used to satisfy the above requirements.

III. Normal Progress Towards the MSE Degree

Each semester of enrollment, a student must make *normal progress* towards the MSE degree. Normal progress is considered to be:

- a grade point average of 3.0 or better
- a supervisory committee and major professor chosen and a Program of Study filed after the completion of 12 credit hours.
- A coursework load of 9 credit hours each fall or spring semester (Distance Education students may take as few as 3 credit hours a semester)