Graduate Student Handbook

for the following programs:

Master of Engineering

Master of Science Engineering/Engineering Science
concentration in Software Engineering

Global Outreach and Extended Education
Ira A. Fulton Schools of Engineering
Arizona State University

MANUAL OF THE MASTERS DEGREES IN:
MASTER OF SCIENCE ENGINEERING (MSE)
MASTER OF ENGINEERING (MEng)

ARIZONA STATE UNIVERSITY
2018 – 2019

MSE and MEng graduate degrees please contact:
Global Outreach and Extended Education
Ira A. Fulton School of Engineering
Arizona State University
Tempe, AZ 85287-8809
PHONE: (480) 965-0637
MSE/ES & MEng on the web: https://asuengineeringonline.com/online-degrees/
E-mail address: student-fseonline@asu.edu

CONTENTS

Table of Contents

INTRODUCTION

Purpose of the Handbook

This Handbook serves as a guide for graduate students admitted to Master of Engineering and Master of Science Engineering/ Engineering Science programs administered by the Office of Global Outreach and Extended Education. This handbook serves as an initial resource for answers to common questions; however, students are also encouraged to consult with the graduate advisor and the faculty committee chair. The primary reference for graduate students on rules and regulations is the Arizona State University (ASU) Academic Catalog. Each student should become familiar with the Academic Catalog and the ASU Graduate College website and policies. Please note that policies and procedures are occasionally amended to improve the program.

Overview of Online Delivery

The MEng and MSE programs are available completely online for students to access from any location. Classes are developed specifically for online students to create a comprehensive and engaging experience that mirrors the curriculum, outcomes, and rigor of Fulton's campus based programs. Course material is delivered through various means including interactive content, lectures, multi-media, and text. Opportunities for interaction with faculty and collaboration with peers are also embedded throughout the courses through both synchronous and asynchronous means. The Office of Global Outreach and Extended Education (GOEE) administers the digital immersion programs.

Areas of Study for Master of Engineering

The Master of Engineering degree program at Arizona State University (administered by the Office of Global Outreach and Extended Education, GOEE) offers opportunities for study beyond the bachelor's degree in-three areas of study: Engineering Management, Quality & Reliability Engineering, and Systems Engineering. These programs are designed for working professionals and delivered entirely online to meet the unique needs of professional engineers.

Master of Science in Engineering – Engineering Science-concentration Software Engineering

The Master of Science in Engineering in engineering science at Arizona State University (administered by the Office of Global Outreach and Extended Education, GOEE) offers opportunities for study beyond the bachelor's degree in the concentration of Software Engineering. This program is designed for working professionals and delivered entirely online to meet the unique needs of professional engineers.

General Information

General information, including admission, residency, and degree requirements of the Graduate College is contained in the latest ASU *Graduate Catalog*. (The *Catalog* is available on the Web at http://catalog.asu.edu) The Graduate College general requirements apply in their entirety to graduate programs in Master of Engineering and

Master of Science in Engineering. This document contains additional and more specific requirements of the graduate programs administered by GOEE.

New Students

All new students will receive an email from the Office of Global Outreach and Extended Education (cpd.hwexam@asu.edu) after a recommendation for admission has been made to the Graduate College. This email serves to inform the incoming student about important Arizona State University notifications they should anticipate to receive regard their admittance. It will also include the assignment and contact information for the assigned faculty advisor, contact information for the graduate advisor, important links to view the Graduate Handbook, and information about building the interactive Plan of Study (iPOS).

Student Responsibility

It is the responsibility of each student to understand and observe all procedures and requirements specified by the Graduate College and the faculty in the engineering programs. The faculty and graduate advisor provide academic advice and assistance; however, the ultimate responsibility for meeting degree requirements remains with the student. Important websites regarding student responsibilities may be found via:

- The Office of Graduate Education – http://graduate.asu.edu
- The Student Code of Conduct - https://eoss.asu.edu/dos/srr/codeofconduct
- Academic Integrity - https://provost.asu.edu/academic-integrity
- Graduate Education Policies and Procedures – https://graduate.asu.edu/policies-procedures
- Global Outreach and Extended Education Student Manual - https://asuengineeringonline.com/sites/default/files/goee-student-manual.pdf
- The Ira A. Fulton School of Engineering – http://engineering.asu.edu

Faculty Responsibility

The members of the faculty that instruct for the Master of Engineering and Master of Science Engineering/ Engineering Science programs have diverse backgrounds and knowledge. They are available to assist you in your plan of study and your educational and career goals. We encourage you to take the opportunity to reach out to your faculty with any questions regarding course content and/or industry related questions.

THE GRADUATE PROGRAMS WITHIN GLOBAL OUTREACH AND EXTENDED EDUCATION

Administration

The Office of Global Outreach and Extended Education administers the Master of Engineering and the Master of Science in Engineering – Engineering Science with concentration in Software Engineering, in accordance with policies of the Graduate College, the Ira A. Fulton Schools of Engineering, and the departmental faculty. In addition, the Academic Director serves as the focal point for graduate students and graduate programs within the department.

Graduate Degree Programs

The online engineering programs offer courses leading to the degrees of Master of Science (MS), Master of Science in Engineering (MSE), and Master of Engineering (MEng). The MEng is a graduate degree intended to meet the needs of Arizona's practicing engineers and is designed primarily for Online students.

General requirements for these degrees are stated in the current Graduate Catalog.

Engineering Vision and Mission

Vision: Leading Engineering Discovery and Innovative Education for Global Impact on Quality of Life.

Mission: Provide an Environment Rich in Transdisciplinary Research, Education, Entrepreneurship, and Leadership Resulting in Successful Engineers and Technologies that Benefit Society.

ADMISSIONS

Eligibility

The Master of Engineering degree requires bachelor of science in engineering, science, or math and have taken a calculus sequence while pursuing their B.S. and have completed an undergraduate calculus-based probability and statistics course. However, in some cases, students with nontraditional educational backgrounds will be considered for admission. These students may be required to take fundamental courses to better prepare them for the program coursework.

The Master of Science Engineering/ Engineering Science concentration Software Engineering degree requires that applicants must provide evidence of demonstrated expertise in the area of object-oriented programming, advanced data structures, algorithm design and algorithm analysis; maturity in high-level programming (required); and successful completion of Calculus I (a minimum requirement) to be considered for admission.

Application

Applications are accepted for fall, spring, and summer terms for these programs. In order for applications to be properly processed all students are required to submit the following: an application, all required supporting materials listed below with the Office of Graduate Admission, and pay the required fee. Incomplete applications will not be considered.

List of required supporting materials.

1. Official transcripts from all universities attended
2. Statement of Purpose
3. Current Resume (optional, but highly recommended)

4. English Proficiency- required for all international applicants from a country whose native language is not English

English Proficiency- Required for all international applicants from a country whose native language is not English to provide the Test of English as a Foreign Languages (TOEFL) or the International English Language Testing System (IETLS) scores. Applications will not be processed until the university receives official English Proficiency scores, and are valid two years from the start date of the degree program. The ASU Institution code is 4007. If department code is required use 99 for TOEFL.

Transcripts should be mailed to:

Arizona State University
Graduate Admission Services
P.O. Box 870112
Tempe, AZ 85287-0112

Non-degree Students

Non-degree students will not be allowed to register for online engineering courses without special permission. To enroll in graduate-level online courses as a non-degree student, the applicant must meet the requirements for regular admission to the graduate program.

Assigned Faculty Advisor

Before beginning coursework for a graduate program, admitted students will be assigned a faculty advisor within the discipline of their program. Faculty advisors are tenured professors and experts in their centralized area within Engineering. Faculty advisors can help students in their selection of elective courses, research topics, and approval of the program of study.

PLAN OF STUDY

Before completing the first nine credits of graduate course work, each student must submit a plan of study (iPOS), which must be approved by the student's faculty advisor, the Academic Director and the Graduate College. The plan of study will list all courses that are to be completed as part of the student's degree program as well as a schedule for completion of any undergraduate or graduate deficiencies. The plan of study may be amended as the student progresses through the program with the approval of the student's faculty advisor and the Graduate Program Chair. The plan of study should be designed using the designated Course Plan Outlines listed below.

Course Plan Outline

Master of Engineering area of study Engineering Management

Core Courses:

Select three (3) of the following Industrial Engineering Methods Courses:

- IEE505 Information Systems Engineering*
- IEE506 Web Enabled Decision Support Systems*

- IEE520 Statistical Learning for Data Mining
- IEE545 Simulating Stochastic Systems
- IEE572 Design of Experiments (math course meeting MEng requirements) ^
- IEE574 Applied Deterministic Operations Research
- IEE575 Applied Stochastic Operations Research Models

Select four (4) of the following Engineering Management Core Courses:

- IEE512 Financial Engineering^
- IEE530 Enterprise Modeling
- IEE541 Engineering Administration
- IEE552 Strategic Technology Management
- IEE454 Risk Management
- IEE556 Introduction to Systems Engineering
- IEE458 Project Management
- IEE571 Quality Management
- IEE 581 Six Sigma Methodology**

Elective Courses:

Select two (2) electives from one area. Below are *examples* of possible electives.

Innovation and Entrepreneurship:

- FSE501 Technology Entrepreneurship
- FSE502 Strategic Enterprise Innovation

Software:

- CSE566 Software Project, Process and Quality Management
- CSE565 Software Verification, Validation, and Testing

Supply Chain:

- IEE534 Supply Chain Modeling and Analysis
- IEE561 Production Systems△

Quality and Reliability:

- IEE570 Advanced Quality Control**
- IEE573 Reliability Engineering
- IEE578 Regression Analysis

^IEE 512 may be used as an Industrial Engineering Methods course if the option to complete another IEM course is not available to the student.

*Students may select IEE 505 **OR** IEE 506. Students may not complete both as they are considered duplicative.

**required courses must be selected for students pursuing the Lean Six Sigma Black Belt.

Capstone:

Select one (1) capstone experience:

- IEE593 Engineering Management Applied Project
  IEE585 Six Sigma Capstone Project (only permissible for students admitted into the *concurrent LEAN SIX SIGMA BLACK BELT certificate*)

Master of Engineering area of study Quality, Reliability, and Statistical Engineering:

Core Courses:

- IEE 572 Design of Engineering Experiments
- IEE 578 Regression Analysis
- IEE 570 Advanced Quality Control
- IEE 573 Reliability Engineering
- IEE 571 Quality Management

Elective Courses:

(Select four (4) electives)

- IEE 520 Data Mining
- IEE 579 Time Series and Forecasting

- IEE 581 Six Sigma Methodology*
- IEE 561 Production Systems
- IEE 582 Response Surfaces and Process Optimization
- IEE 512 Introduction to Financial Engineering
- IEE 552 Strategic Technological Planning
- IEE 545 Simulating Stochastic Systems
- IEE 574 Applied Deterministic Operations Research Models
- IEE 575 Applied Stochastic Operations Research Models
- IEE 534 Supply Chain Modeling and Analysis

*required course must be selected for students pursuing the Lean Six Sigma Black Belt.

Capstone:
Select one (1) capstone experience:
- IEE593 Engineering Management Applied Project
  IEE585 Six Sigma Capstone Project (for students admitted into the *concurrent LEAN SIX SIGMA BLACK BELT certificate*)

Master of Engineering area of study Systems Engineering:

Core Courses:
Select one (1) Engineering Management Course:
- IEE 454 Risk Management
- IEE 458 Project Management
- IEE 541 Engineering Administration
- IEE 552 Strategic Technologic Planning
- FSE 501 Technology Entrepreneurship
- FSE 502 Strategic Enterprise Innovation

Select (five) of the following Systems Core Courses:
- IEE 505 Information Systems Engineering*
- IEE 506 Web Enabled Decision Support Systems*
- IEE 512 Financial Engineering
- IEE 530 Enterprise Modeling
- IEE 545 Simulating Stochastic Systems
- IEE 570 Advanced Quality Control
- IEE 572 Design of Experiments
- IEE 573 Reliability Engineering
- IEE 574 Applied Deterministic Operations Research

*Students may select IEE 505 **OR** IEE 506. Students may not complete both as they are considered duplicative.

Concentration Course:
- IEE 556 Introduction to Systems Engineering

Elective Courses:
Select two (2) electives from one area. Below are *examples* of possible electives.
Software:
- CSE 565 Software Verification and Validation
- CSE 566 Software Project, Process and Quality Management

Hardware:
- EEE 586 Nonlinear Control Systems
- EEE 587 Optimal Control Systems

Innovation and Entrepreneurship: (students may not take IEE 552 if selecting this elective area as they are considered duplicative to the courses below)
- FSE501 Technology Entrepreneurship
- FSE502 Strategic Enterprise Innovation

Supply Chain:

- IEE534 Supply Chain Modeling and Analysis
- IEE561 Production Systems△

Quality and Reliability
- IEE570 Advanced Quality Control**
- IEE581 Six Sigma Methodology**

**required course must be selected for students pursuing the Lean Six Sigma Black Belt.

Capstone:
Select one (1) capstone experience:
- IEE593 Systems Engineering Applied Project
  IEE585 Six Sigma Capstone Project (for students admitted into the *concurrent LEAN SIX SIGMA BLACK BELT certificate*)

Master of Science Engineering/Engineering Science concentration Software Engineering

Core Courses:
- CSE 565: Software Verification and Validation
- CSE 566: Software Project, Process and Quality Management

Concentration Course:
- CSE 591: Software Engineering Principles and Concepts

Elective Courses: 18-21 credit hours
Select 18-21 elective credits. At least 6 credits in CSE. *Examples* are listed below:
- CSE 564: Software Design
- CSE 598: Software Analysis and Design
- CSE 598: Distributed Software Development
- CSE 561: Modeling & Simulation Theory and Application
- CSE 598: Software Integration and Engineering
- CSE 598: Web Usability: Principles and Techniques
- EEE 511: Artificial Neural Computation
- EEE 553: Coding and Cryptography
- FSE 501: Technology Entrepreneurship
- IEE 556: Introduction to Systems Engineering
- IEE 572: Design of Experiments
- IEE 598: Design for Six Sigma

Capstone:
All students admitted to the M.S.E. program in engineering science with a concentration in software engineering must complete a culminating experience. The culminating experience can be fulfilled with one of the following:
- CSE 593: Applied Project
- Applied Portfolio. See **Culminating Experience** as listed below.

Culminating Experience

Master of Engineering

All students admitted to the Master of Engineering must complete an applied project to serve as the culminating experience for their graduate study. A grade of "B" or better is required in your Applied Project.

Applied Project
Students will enroll in their corresponding Applied Project course for their program (IEE593) and work their faculty advisor to complete a self-identified project (ex: research

proposal, development project). Department override must be obtained before enrolling in this course. A grade of "B" or better is required in your Applied Project.

Master of Science Engineering/Engineering Science concentration Software Engineering

All students admitted to the M.S.E. program in engineering science with a concentration in software engineering must complete an applied project or a portfolio to serve as the culminating experience for their graduate study.

Applied Project

Students will enroll in CSE593: Applied Project and work with a faculty member to complete a self-identified project (ex: research proposal, development project). Department override must be obtained before enrolling in this course. A grade of "B" or better is required in your Applied Project.

Portfolio

The portfolio entails a written summary of the student's learning supported by one project from each of three engineering 500+ level courses in which a final grade of a B or better was earned in each course and final approval by the student's faculty advisor and the graduate program academic director.
A written summary of your learning outcomes of your program of study in typewritten format approximately 1-2 pages. This reflection should include what you have learned with relation to the three supporting projects. The three referenced projects must be submitted with the Master's Portfolio Submission Cover Sheet to the GOEE office. Students should submit their portfolio prior to their last semester to allow sufficient time for review and approval.

After approval by the faculty advisor and the graduate program academic director, the GOEE graduate advisor will notify the Graduate College of satisfactory completion of the Project Portfolio. Once the portfolio is approved and processed, students will see the culminating experience satisfied through MyASU – iPOS tab.

ACADEMIC REQUIREMENTS AND POLICIES

Academic Integrity

Students have the responsibility to understand and uphold the highest standards of academic integrity. Newly admitted graduate students will receive a "priority task" on their MyASU directing them to complete module on academic integrity. The module consists of a PowerPoint that outlines academic integrity and students must take a quiz and pass with an 80% or higher.

The failure of any graduate student to meet these standards may result in serious consequences including suspension or expulsion from the university and/or other

sanctions as specified in the academic integrity policies of individual colleges as well as the university. Violations of academic integrity include, but are not limited to: cheating, fabrication, tampering, plagiarism, or aiding and/or facilitating such activities. At the graduate level, it is expected that students are familiar with these issues and each student must take personal responsibility in their work. In addition, graduate students are expected to follow university guidelines related to the Student Code of Conduct. University policies related to academic integrity and code of conduct are available at http://students.asu.edu/srr/code.

Time Limit

All work toward the MEng/MSE-ES degrees must be completed within six consecutive years. The six years begins with the semester and year of admission to the program. Graduate courses taken prior to admission that are included on the Plan of Study must have been completed within three years of the semester and year of admission to the program.

Grades

Academic excellence is expected of graduate students. A student who has been admitted to a graduate degree program in Engineering, either on a regular or provisional admission status, must maintain a 3.0 or higher grade point average (GPA) in:

1. All work taken for graduate credit (courses numbered 500 or higher),
2. The coursework in the student's approved plan of study, and
3. All course work taken at ASU (overall GPA) post baccalaureate.

A student will be placed on academic probation if one or more of the student's GPAs listed above falls below 3.0. Students will be notified by mail when placed on academic probation.

Academic Status: Satisfactory and Probation

After each semester, the academic unit reviews students' files for satisfactory progress towards completion of the degree. All students are placed on one of the four categories:

1. **Satisfactory progress** means that the student does not have any academic and progress probationary issues.

2. **Academic Probation** pertains to grades that might affect Program and University policies including graduation. The following are notices/letters you will receive if one of these pertains to your academics:
   - GPA below 3.0 in approved POS courses.
   - Overall post baccalaureate GPA below 3.0.
   - Overall graduate (500 level or above) GPA below 3.0.
   - Received a "D" or "E" in a required deficiency course or in a course at the 400 level or above.
   - Deficiency GPA below 3.0.

3. **Progress probation** pertains to issues dealing with making progress towards a degree. The following are notices/letters you will receive if one of these pertains to your academics:
   - Lack of Progress toward removing deficiencies as listed on your admission letter.

4. A student is recommended for **withdrawal from the program** if she or he fails to meet the probationary standards placed upon in the semester mentioned in the probationary letter. The student will receive a letter from Global Outreach and Extended Education explaining the reasons for the withdrawal. The student will have 5 calendar days from the date of the letter to appeal the decision. The Graduate Affairs Committee (GAC) will review the case and will make the necessary recommendation. The Graduate Program Chair, on behalf of the GAC, will provide a written explanation of the outcome. If the outcome is favorable, the student will have to meet all the outlined requirements at the end of the specified period. If the GAC recommends that the appeal is not granted in favor of the student, the Graduate Program Chair, on behalf of the GAC, will recommend to the Dean's Academic Affairs to withdraw the student from the graduate program. The original appeal will be sent to the Ira A. Fulton Schools Standards Committee which reviews the student's case and makes the final ruling to Associate Dean and the Academic Unit. If the appeal is not granted in favor of the student, the Dean's Academic and Student Affairs will recommend to the Graduate College to withdraw the student from the graduate program. Please refer to the Graduate College catalog on policies and procedures or contact the graduate advisor within Global Outreach and Extended Education.

Enrollment Policies

The department and the university have firm policies related to students needing to enroll each semester. Once admitted to a graduate degree program, students must be registered for a minimum of one credit hour (not audit) during their semester of admission and each fall and spring semester of their graduate education. This credit must appear on the Plan of Study or must be an appropriate graduate-level course (e.g. 595, Continuing Registration). Courses with grades of "W" and "X" are not considered valid registration for continuous enrollment purposes.

Leave of Absence Policies

Students planning to discontinue enrollment for a semester or more must request an approval to Request to Maintain Continuous Enrollment by the Graduate College. To submit a Request to Maintain Continuous Enrollment, you may sign into your Plan of Study to make this request via petition. Students may petition the Graduate College for a leave of absence for a maximum of two semesters during their entire program. A petition for a leave of absence, endorsed by the student's faculty advisor and the Academic Director, must be approved by the Graduate College. This request must be submitted and approved before the anticipated absence.

An approved leave of absence will enable students to re-enter their program without reapplying to the university. Students who do not enroll for a fall or spring semester without an approved leave of absence by the Graduate College are considered withdrawn from the university under the assumption that they have decided to discontinue their program. A student removed for this reason may reapply for admission to resume their degree program; the application will be considered along with all other new applications to the degree program.

A student on leave is not required to pay fees, but in turn is not permitted to place any demands on university faculty or use any university resources

Academic Calendar

Students are responsible for meeting all deadlines set within the ASU Academic Calendar. The calendar can be found at: http://students.asu.edu/academic-calendar and on the front page of the my.asu.edu website.

FINANCIAL INFORMATION

Program Tuition

Upon admission, students will pay an online engineering program tuition in addition to their tuition based on admission (i.e. online, non-degree, resident, non-resident). Currently, the program tuition is $402 per credit hour. This fee is not regularly covered by the tuition waivers.

Financial Aid

For information about qualifying for financial aid, please see Student Financial Assistance Office at http://students.asu.edu/costs-finances.

Scholarships

For links to national scholarship searches and other valuable ASU scholarship information, you may visit our scholarship website at: https://scholarships.asu.edu/. To apply for scholarships via this feature, a student ASUrite user ID and password are required.

CONTACT INFORMATION

Homework and Exams
cpd.hwexam@asu.edu or 480.965.0637

General Program Questions
student-fseonline@asu.edu or 480.965.0637

Online Student Services
Angela Harguess
Email: student-fseonline@asu.edu or 480.965.1878