Software Engineering
MS Graduate Handbook
2015 - 2016

ARIZONA STATE UNIVERSITY

MANUAL OF THE MS DEGREE IN SOFTWARE ENGINEERING

ARIZONA STATE UNIVERSITY

2015 – 2016

Software Engineering graduate degrees please contact:

Office of Graduate Programs
School of Computing, Informatics, and Decision Systems Engineering
Arizona State University
Polytechnic Campus
Advising Center
6073 S. Backus Mall,
Mesa, AZ 85287-0180

SE on the web: http://cidse.engineering.asu.edu/forstudent/graduate/software-engineering/
E-mail address: cidse.advising@asu.edu

Revised November 2015

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I. Introduction to the Software Engineering Program

The MS in Software Engineering Program focuses on developing advanced knowledge and abilities in the design and application of software. The program involves the application of engineering principles to software development including design methodologies, operation principles, and maintenance and testing approaches. The MS in Software Engineering Program builds upon the BS in Software Engineering program and is aimed at developing professional skills in this discipline as well as providing opportunities for students to engage in and develop research abilities.

II. Objective of the handbook

The purpose of this handbook is to provide guidance and information related to admission, degree requirements, and general policies and procedures. Please note that in some cases you will find differences between the Graduate Policies and Procedures and the Software Engineering Program requirements. In these cases, SE has established higher standards. Students must satisfy both sets of requirements. Please note that policies and procedures are occasionally amended to improve the program. Changes will be communicated to students through email, and posting on paper and online bulletin boards.

III. Student responsibility

All students are expected to become familiar with university and program policies and procedures and abide by the terms set forth. Information is available both online and by hardcopy upon request. Most importantly you should visit the following websites:

- The Office of Graduate Education – http://graduate.asu.edu.
- The Graduate Catalog – www.asu.edu/catalog visit the section on policies and procedures.
- The Software Engineering Program – http://cidse.engineering.asu.edu/forstudent/graduate/software-engineering/
- The International Student Office – https://international.asu.edu/, if applicable.
- The Ira A. Fulton Schools of Engineering – http://engineering.asu.edu

IV. Faculty responsibility

The members of the faculty of Software Engineering 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 make individual appointments with faculty members with whom you have common interests. Please refer to the list of the faculty names, areas of expertise, and research interest at the end of this handbook.

V. Admission and eligibility to the MS degree programs

The Software Engineering MS degree requires a background in engineering, computers, math, sciences or closely related fields. However, in some cases students with non-traditional educational backgrounds will be considered for admission. These students may be required to take foundational courses to better prepare for the graduate coursework. A student is encouraged to contact a graduate advisor in the School of

Computing, Informatics, and Decision Systems Engineering Advising Center to obtain advice on their educational pursuits.

Eligibility - Prior to applying to the SE MS program, students are required to have completed two semesters or 8 credit hours of Calculus (Calc. I & II).

Application - All students are required to submit an application with the Office of Graduate Education and pay the required fee in order to have their application properly processed.

Application deadlines - **January 15 for Fall and September 15 for Spring**:
To receive full consideration, we ask that you have all the required documents submitted by the deadline.

GRE scores - All students are required to submit official **general** Graduate Record Examination (GRE) scores directly to the Office of Graduate Education. The average scores for students admitted into the MS program are available on the CIDSE website. We do not require specific subject GRE scores, but they are considered in conjunction with other application materials.

TOEFL/English Proficiency - The University requires 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 (IELTS) scores. The Software Engineering Program uses 575 (paper-based) or 90 (internet-based) as minimum expectations for admission. **Please note that your application will not be processed until the university receives official TOEFL scores, which are valid two years from the start date of the degree program.** There are some exceptions for students who have been living in the United States and would like to have the TOEFL waived. They should consult the Office of Graduate Education. Please address all English Proficiency questions to the Office of Graduate Education.

Personal statement - Applicant must submit a personal statement that indicates professional goals and reasons for desiring to enroll in the /MS programs.

Letters of recommendation - SE requires three (3) letters of recommendation, at least one of which must come from former faculty. There is no standard form for letters of recommendation. Our current application process allows students to submit the letter of recommendations electronically by indicating the names and the e-mails of the recommender. In turn, the Office of Graduate Education sends an e-mail to the recommender alerting him or her to go online and submit a recommendation. We encourage letters from people who know you well, such as teachers, professional associates and supervisors. Ask people who can comment on your academic, emotional, intellectual and professional development.

GPA requirement - To be considered for the MS program, we require a minimum cumulative GPA of 3.0 in the last 60 credit hours of the undergraduate degree.

Application evaluation - Several factors are taken into consideration when evaluating a student's application: the student's cumulative GPA, major, institution, personal statement, letters of recommendation, standardized test scores, and performance in individual courses.

Deficiencies - Depending on prior academic preparation and accomplishments of an applicant, deficiency courses may be specified to ensure adequate background preparation. Students wishing to have their course syllabi examined as evidence that deficiencies have been satisfied must submit a petition form together with the support documents to CIDSE.Advising@asu.edu. If after evaluation the petition is not approved, the student may choose to take the deficiency test-out examination. Please note that deficiencies are not intended solely as prerequisites for graduate coursework; they also satisfy the breadth requirement for all graduates of SE.

Deficiency test-out exam - On the day before orientation in Fall and Spring semesters, a classroom will be set aside to allow students entering with deficiencies (listed in the admissions letter) to take a brief test to establish whether they possess basic knowledge of the course sufficient to have an assigned deficiency waived. This scheduled testing period is the only opportunity for deficiency test-outs. No other arrangements will be made for students to test-out of assigned deficiencies.

Below is a list of prerequisites along with the associated ASU course numbers:

- CST 250 Microcomputer Architecture and Programming
- SER 221 Programming Languages and Their Execution Environment
- SER 222 Design and Analysis of Data Structures and Algorithms
- SER 234 Operating Systems and Networks
- CSE 360 Software Engineering

Deficiency coursework completed with a grade of "C" or better at the undergraduate level will satisfy the requirements. A grade of "B" or better is required for all assigned deficiency coursework at the post-baccalaureate level.

Notice of Admission - SE submits its recommendation of admission to Graduate Admissions and the final notice of admission decision is sent in writing by Graduate Admissions. You may check your application status on My ASU (my.asu.edu).

Pre-admission credits and Transfer credit – Please refer to the Office of Graduate Education policies and procedures.

VI. Degree Requirements

A minimum of 30 credit hours of coursework beyond the bachelor's degree and deficiency courses are required to complete the MS degrees. All Master's students are required to develop and submit a Plan of Study (iPOS) through online ASU Interactive prior to pre- registering for courses for the upcoming semester. The iPOS should be

developed with the aid of the student's faculty advisor. The SE Graduate Academic Advisor, acting on behalf of the Graduate Program Chair, will initially advise the student. Assigned deficiency courses must be completed by the end of the 1st year. A grade of "B" or better average is required for deficiency courses, and a "B" must be achieved in each course. A grade of "B" or better in a course that follows a prerequisite class does not waive this requirement. **Students who are deficient in SER222 must satisfy the deficiency before taking SER501. Students who are deficient in SER221 must satisfy the deficiency before taking SER502**.

Degree requirements, **area of study courses, and comprehensive exams are defined below**.

The four **core courses** from the courses listed below **must be completed by the end of the 18th semester hour applied to the Plan of Study** (four of the first six POS classes). The four core courses include a course in Data Structure and Algorithm Analysis, a course in Language and Programming Paradigms, a course in Software Enterprise, and a course in Project and Process Management. These courses are intended to expose the student to the fundamental topics across the SE spectrum. A grade of "C" or better must be achieved in each core course. Please note the core is not intended solely as prerequisites for following coursework; it also satisfies the breadth requirement for all graduates of our program.

Required Coursework (12 credit hours)

SER 501 Advanced Data Structures and Algorithm Analysis (3)
SER 502 Emerging Language and Programming Paradigms (3)
SER 515 Software Enterprise: Inception and Elaboration (3)
SER 516 Software Enterprise: Project and Process Management (3)

Elective Courses (12 credit hours)

- SER graduate-level courses, or CSE Software-engineering courses CSE563, CSE564, CSE565, and CSE566
- Max of 6 credits of 598 coursework
- Max of 6 credits of CSE 500-level coursework, outside software engineering, excluding CSE545 and CSE551

Culminating Experience Options

- Capstone
  - SER 517 Software Factory I (3)
  - SER 518 Software Factory II (3)
- Applied Project
  - SER 593 Applied Project (6)
- Thesis
  - SER 599 Thesis (6)

MS Thesis Option:
MS students writing a thesis require a research advisory committee comprised of at least three faculty members including the committee chair. The two additional members are chosen jointly by the committee chair and the student to facilitate the student's research. A least one additional member should be from the SE faculty. Please refer at the back of the handbook for a list of area faculty and their research.

For MS students, the thesis and a successful oral defense constitute their final examination. A majority pass vote by the student's committee is required. For visa reasons, international students have a maximum of two semesters to finish the thesis after completion of coursework listed in the POS.

Steps to Preparing for Your MS Defense:
Prior to defense:

1. Obtain a consensus of approval from the committee chair and the committee members to proceed with the oral defense.
2. Schedule a date and time with your committee for the oral defense on MyASU.
3. Important: Ensure that a minimum of 50% of the official committee be physically present at the defense. If at least 50% of the committee cannot be physically present, the defense must be rescheduled.
4. Visit the Office of Graduate Education website to familiarize yourself with the dates and deadlines on format approval.

10 days prior to the defense: These steps are required to be complete prior to 10 working days from the date of oral defense.

1. Reserve a room with the CIDSE SE administrative staff (Peralta 2nd Floor).
2. Submit an electronic version of your abstract with title, full names of your committee members, defense date/time/place, and your name as you want it to appear on the defense announcement to the CIDSE SE administrative office (Peralta 2nd Floor).
3. Schedule on MyASU your defense with the Office of Graduate Education.

On the day of the defense:

1. Set-up all your equipment at least one half-hour prior to your presentation to make sure they work properly.

After the defense:

1. Your committee will have comments and a discussion with you. At the end, the committee makes a recommendation: Pass, Pass with minor revisions, Pass with major revisions, or Fail.
2. Revisions are normal and are expected to be completed within one-year period. This includes remaining registered until the finished document has been uploaded through MyASU on ProQuest.
3. Hand-deliver a copy of your Thesis Defense Report form to the Advising Center (Wanner Hall 2nd floor).

4. Follow the steps on MyASU on uploading your final dissertation through Office of Graduate Education and ProQuest.

VII. General Information

A. Research Standards for Publication of Thesis

Graduate research is the study of an issue that is of sufficient breadth and depth to be publishable in an SE-related journal. The effort should reflect a minimum of 750 hours of thoughtful work for a thesis (M.S.). The research should follow a 'scientific method' and thus be objective. The thesis should demonstrate independent, original, and creative inquiry. There should be predefined hypotheses or developmental goals and objectives that are measurable and can be tested. The document should demonstrate proficiency with written English and should conform to the Office of Graduate Education format guidelines. For more information on format guidelines, please visit the Office of Graduate Education web site http://graduate.asu.edu.

B. Financial assistance and/or fellowships

There are limited funds for MS students. We encourage students to pursue assistantships outside the SE and not limit their search to SE.

C. Continuous Enrollment and Leave of Absence Policies

Once admitted to a graduate degree program, master and doctoral students must be registered for a minimum of one graduate credit hour (not audit) during all phases of their graduate education. This includes periods when they are engaged in research, working on or defending theses or dissertations, taking comprehensive exams, or in any other way using university facilities or faculty time including the term in which they graduate. This credit must appear on the *Plan of Study* or must be an appropriate graduate-level course (e.g. 595, 695, or 795, Continuing Registration). Courses with grades of "I" where the grade stays permanent, "W" and "X" are not considered valid registration for continuous enrollment purposes.

Students planning to discontinue enrollment for a semester or more must request approval for a leave of absence. Students may petition the Office of Graduate Education 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 members of the student's supervisory committee and the head of the academic unit, must be approved by the Office of Graduate Education dean. This request must be filed and approved before the anticipated absence.

An approved leave of absence will enable students to re-enter their program without re-applying to the university. Students who do not enroll for a fall or spring semester without an approved leave of absence by the Office of Graduate Education 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.

D. Maximum Time Limit

All work toward a MS degree 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.

E. Registration requirements for research assistants (RA) and teaching assistants (TA)

Students awarded an assistantship within the Ira A. Fulton Schools of Engineering are required to be registered for 12 credit hours (no more, no less). Audit credit hours do not count towards the 12 credit hours.

Students who obtain an assistantship outside the Ira A. Fulton Schools of Engineering are required to follow the policy of the unit that hires them.

TAs and RAs are treated as residents for tuition purposes. To be eligible for tuition remission, TAs and RAs must be employed a minimum of 10 hours per week (25 percent Full Time Equivalency {FTE}). TAs/RAs working 10-19 hours per week (25-49 percent FTE) receive a 50 percent remission of tuition for the semester or summer session of their employment. TAs/RAs working 20 hours per week (50 percent FTE) do not pay tuition during the semester or summer session of their employment. In addition, the university pays the individual's health insurance premium for those TAs and RAs working 20 hours per week (50 percent FTE).

F. Satisfactory Progress, Academic Probation, Progress probation, and Withdrawal from the SE Program: Each semester, the Software Engineering Program reviews students' files for satisfactory progress towards completion of the degree. All students are placed on one of the four categories:

1. Satisfactory progress
2. Academic Probation
3. Progress probation
4. Withdrawal from the SE Program.

1. **Satisfactory progress** means that the student does not have any academic and progress probationary issues. In addition to the probationary rules, satisfactory progress includes communication each semester with the student's Committee Chair regarding his or her progress.

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.
- Lack of Progress toward completing the four Core courses within the first 18 hours of POS courses.

4. A student is recommended for **withdrawal from the SE 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 the Software Engineering Program explaining the reasons for the withdrawal. The student will have 5 working days from the date of the letter to appeal the decision. The SE Graduate Program Committee (GPC) will review the case and will make the necessary recommendation. The Graduate Program Chair, on behalf of the GPC, 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. The student will be required to sign an agreement acknowledging the recommendations and the consequences if the agreements are not met. If the GPC recommends that the appeal is not granted in favor of the student, the Graduate Program Chair, on behalf of the GPC, will recommend to the Dean's Academic Affairs to withdraw the student from the SE Program. The student will then have the opportunity to appeal to the Ira A. Fulton Schools Standards Committee, which reviews the student's case and makes the final ruling to Associate Dean and the SE Program. If the appeal is not granted in favor of the student, the Dean's Academic and Student Affairs will recommend to the Office of Graduate Education to withdraw the student from the SE MS Program. Please refer the Office of Graduate Education catalog on policies and procedures or contact the graduate advisor in the CIDSE Advising Center.

G. Academic Integrity

The highest standards of academic integrity are expected of all graduate students, both in the academic coursework and in their related research activities. 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. All students are required to complete an independent academic integrity course module during their first semester in the program. Students are provided details of this requirement upon registration.

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 in the Office of Graduate Education, or at http://graduate.asu.edu/beintheknow.

H. SER 584 - Internship

Curricular Practical Training (CPT) is an academic experience usually obtained at off-campus work settings, allowing the student to apply knowledge and skills gained in various classes. It is intended as a unique, hands-on learning experience to provide students with a number of valuable skills that they can use upon graduation from their graduate degree programs. Accordingly, it is not available to full-time or part-time workers regularly employed by the company where the internship is proposed.

The CPT is available to both domestic and international students. However, international students must work with the International Students and Scholars Center (ISSC) and submit additional documentation to obtain work authorization. Furthermore, international students must include the CPT course SER 584 (1 credit hour) as an integral part of their Program of Study, reflected by their approved iPOS.

Addition of the CPT course(s) should be done at the initial submission of the student's iPOS during the first semester of study. (Note that each student is required to file an iPOS by the end of his/her first semester of study). Later additions of CPT courses must be requested and approved at least one full semester (fall, spring or summer) prior to the proposed start date of the internship course. For example, a student planning to do an internship during the summer semester should have an approved iPOS with the internship course before the beginning of classes in the preceding Spring semester. The Internship course cannot be added to an approved iPOS once all coursework has been completed. Exceptions may be made if the internship is relevant to thesis (or dissertation) research.

The Graduate Program Chair will determine the need for a CPT internship in such cases in consultation with the Graduate Academic Advisor. Note that approval of an iPOS with the SER 584 course confirms that the internship is an integral part of the degree requirements as planned by the student. Hence, students who are not able to fulfill the internship credit requirements in their iPOS are required to replace the course credit requirements through the following options:

- taking a 3-credit hour graduate course,
- taking the 1-credit hour CSE 594 seminar
- taking a one credit hour of SER 590 – Reading and Conference (Independent Study).

In order to be eligible for internship, a student must be in **good academic standing and not have an academic integrity violation** in a course for two full semesters (summer semesters not included) from the initial reporting of the incident. For example, a

sanctioned academic integrity violation initially reported on April 15, 2012 will make the student ineligible for this approval until the end of Spring 13 semester.

International students need to be aware of immigration policies and regulations, which may jeopardize their academic status. Hence, it is strongly recommended for international students to consult with the International Students and Scholars Center (ISSC).

All students (domestic and international) may take part in an Out-Of-State internship in the Summer semester. The eligibility requirements for CPT internships remain the same as mentioned.

During the regular Fall and Spring semesters international graduate students in F-1 status must register for a minimum of nine (9) credit hours to maintain full-time status and be enrolled in a minimum six (6) credit hours of in-person, on-campus coursework at the ASU campuses. A maximum of three (3) credit hours of online courses is permitted. The SER 580 Practicum course will not count as satisfying the student's "physical presence" at ASU. Students will not be able to take part in internships outside the Phoenix metropolitan area. In some cases, students may be approved to do an internship in Tucson or other nearby locations to Phoenix, as long as the student is able to prove they can physically attend their courses on campus.

Required documents and forms for the internship proposal must be submitted to the CIDSE Advising Office at least two weeks prior to the beginning of the semester in which the internship is planned. Students will not be able to request late-add registration of the SER 584 Internship credit to their class schedule after the drop/add deadline of each semester.

An approved proposal is required before commencing the internship. The request will include a statement from the employer that indicates they understand that the work is to satisfy a degree requirement. A sample letter and other required forms are available from the Graduate Advisor. Students must receive approval from their faculty advisor and from the Graduate Program Director before registering for SER 584. A final Plan of Study must be filed with the Office of Graduate Education showing the Internship course before registering for SER 584. All application materials for an Internship must be completed by the last day of regular registration for any semester. The student must take classes appearing on the Plan of Study the semester following the internship.

Renege: (verb) to fail to carry out a promise or commitment
Never accept a job with the intention of turning it down if "something better" comes along. Not only is it inconsiderate and unprofessional, it also reflects badly on Arizona State University and might negatively impact another ASU student's opportunity with that employer. Also, employers communicate with each other and you don't want to get a bad reputation.

After you have given your decision careful consideration and accepted an offer, stop looking. Inform other employers who have extended offers that you have accepted another position. Don't accept further interview invitations or search further. Please refer to NACE's Playing Fair…Your Rights and Responsibilities as a Job Seeker http://www.naceweb.org/playing_fair/ to become familiar with Principles for Professional Practice.

A five-page final report is required before a grade and credit is given. The final report must be submitted to the reporting supervisor for comments and then to the faculty advisor for grade assignment.

I. SER 590 Reading and Conference

SER 590 Reading and Conference (Independent Study) is available for MS students. The student must get written approval from the supervising faculty outlining the coverage of the content. The Independent Study form must be approved by the Graduate Program Chair will be placed in the student's file.

J. Instructional Concerns and Course-Related Complaints

Being part of a large university creates opportunities to learn from a diverse instructor population with different teaching styles and modalities for delivering course content. Courses are offered by a diverse set of faculty including those who are research intensive, those whose primary responsibility is teaching, and part-time faculty who are working in the field. Based on enrollment or modality of offering, faculty may also be supported by graduate student teaching assistants and graders. This diverse higher education delivery platform may differ significantly from the high school experience, and while it provides opportunity to expand the student's ability to learn and develop problem solving skills, concerns and conflicts with requirements and instructors may occasionally arise. CIDSE students with instructional concerns should review and adhere to the following guidelines for attempting to resolve their issues. First and foremost, keep in mind that the faculty and advising staff are experienced, dedicated educators that are here to help you achieve your educational goals but at the same time, a
s an engineering and computer science program, they have a responsibility to ensure standards are maintained and student outcomes are achieved prior to graduation. The university culture recognizes the value of diversity in multiple dimensions as well as the presumption of expertise and academic freedom of the faculty.

Communicate with your Instructor

If you have a difference of opinion with your instructor or teaching assistant (TA), or have concerns about technical or administrative aspects of the course, visit the instructor or TA during office hours or contact them via email (if you cannot visit them during the office hours). Express your concerns clearly and respectfully and ask for help. Be sure to provide succinct information about what you are having trouble understanding in the course or your concern. Instructors and TAs are here to help. Please remember that you are responsible for pre-requisite knowledge/skills required for a course and regularly studying the material taught in the course. The teaching staff may not be able to help you with your problem if you lack in the pre-requisite knowledge/skills or have not been

keeping up with the course material. As a guideline, you should be spending three hours studying every week for -each hour of course credit. Thus you should schedule 8-10 hours of time each week to devote to each 3-credit course. In addition, make sure to resolve the issues as soon as they occur and maintain all documentation. For example, if the assignment instructions are not clear, get the clarification on the day the assignment is assigned and do not wait until the deadline of the assignment.

If, after communicating with your instructor or TA, you are still having problems in the course, connect with your academic advisor to understand your options moving forward.

Connect with your Graduate Program Chair

If you are unable to resolve the concern after initial contact with the instructor or the TA, and you have met with your academic advisor, you should then connect with the Graduate Program Chair for your major (or the department offering the course). The Graduate Program Chair will confer with the instructor and/or TA to better understand the concern and try to resolve the problem. Please note that before meeting with the Graduate Program Chair you should have made a reasonable effort to meet with the course instructor (not just the TA) and get the issue resolved. When contacting the Graduate Program Chair provide all the relevant details such as the course syllabus, assignment handout, email exchange with the instructor etc. so that the Graduate Program Chair can promptly act on your concerns. Please be brief and precise in the description of your concerns. In some cases, the Graduate Program Chair would like to meet you. When coming for the meeting please bring along all the relevant documents.

If the instructional concern is not resolved with the Graduate Program Chair or the department offering the course, contact the Associate Dean of Academic Affairs office for the college offering the course for assistance.

Remain Focused

When faced with instructional concerns, it is important to remain focused on the rest of the course while addressing specific areas that are under review. Be sure to stay connected with your academic advisor if there are any changes in your situation.

NOTE:

- Misrepresentation of facts or disrespectful behavior when confronting your instructor or teaching assistant is considered an academic integrity violation.
- Maintain all documentations.
- Act proactively and promptly.

In Summary, Guidelines for Avoiding Problems

- Be sure you have the necessary prerequisite knowledge before starting a course;
- Attend class and on-line exercises regularly;
- Devote time each week to studying to avoid getting behind;
- Contact the TA (if assigned) or instructor during office hours at first sign of trouble and come prepared to ask precise questions and to explain your difficulty
- Accept the fact that you grow intellectually and professionally by being challenged and learning to deal with diverse expectations and environments.

Process for Resolving Conflicts in Grading, Course Expectations, etc.

- Contact the TA (if available) or instructor to explain your concern and seek resolution;
- If the TA/instructor has attempted to assist you but you are still having academic difficulty that is causing personal stress or hindering your academic success, see your Academic Advisor;
- If the TA/instructor is not responsive or does not provide a legitimate response/accommodation, then contact your Graduate Program Chair.
- If you still feel there is a legal, ethical or procedural violation that is victimizing you, contact the Office of the Associate Dean of Engineering for Academic Affairs.
- Circumventing this process will be considered a violation of professional ethics and protocol.

K. Student chapters of professional societies

Our graduate students are involved in many professional societies, most commonly Association for Computing Machinery (ACM) and Institute for Electrical and Electronics Engineers Computer Society (IEEE Computer Society). Most branches of Software Engineering have professional societies associated with them. Participation in professional societies is an excellent road to career and interest group connections. Student membership typically costs less than $30 and includes many benefits including a monthly magazine. Professors will be happy to sign a membership form that will entitle a student to reduced rates. The ASU student chapter of ACM and the Polytechnic Computing Students Association are popular among MSSE students.

Course Descriptions

SER 501 Advanced Data Structures and Algorithms
Advanced algorithms and how they are effectively applied to solve problems. Algorithm design, analysis, classification, optimization, and application. Practice implementing and employing algorithms to solve realistic problems. Prerequisite: Fulton Engineering Graduate Standing. Students who are deficient in SER222 must satisfy the deficiency before taking SER501.

SER 502 Emerging Languages and Programming Paradigms
Emerging programming languages, their design, description, implementation, and advanced features; API design, including facilities for creating secure distributed applications, facilities supporting software services, naming and composition; language paradigms and the resulting implications on execution; run-time systems and storage management; approaches to compilation and execution. Requires ability to program in an object-oriented programming language and knowledge of data structures, algorithms, and analysis. Prerequisite: Fulton Engineering Graduate Standing. Students who are deficient in SER221 must satisfy the deficiency before taking SER502.

SER 515 Software Enterprise: Inception and Elaboration
Project-centric course focusing on the relationship of software processes to entrepreneurship and business processes; requirements specification and requirements analysis; study of the context and evolution of the software enterprise. The first of a two-semester sequence. Prerequisite(s): Master of Computing Studies or Software Engineering MS student

SER 516 Software Enterprise: Project and Process Management
Project-centric course focusing on software process, project management, and technical leadership. Study of the context and evolution of software enterprise project management. The second of a two-semester sequence.

SER 517 Software Factory I
First in a two-semester capstone culminating experience for graduate students. Student teams work through concurrent product and service offering lifecycles in a project context. Covers concepts including opportunity assessment, risk management, technology evaluation, licensing models, resource planning, delivery models such as hosted, turnkey, and Software as a Service (SaaS), technology acquisition, outsourcing, governance, quality assurance, software certification, and continuous process improvement. Prerequisite(s): Masters of Computing Studies or Software Engineering MS student

SER 518 Software Factory II
Second in a two-semester capstone culminating experience for graduate students. Student teams work through concurrent product and service offering lifecycles in a project context. Covers concepts including opportunity assessment, risk management, technology evaluation, licensing models, resource planning, delivery models such as hosted, turnkey, and Software as a Service

(SaaS), technology acquisition, outsourcing, governance, quality assurance, software certification, and continuous process improvement. Prerequisite(s): SER 517

SER 520 Computer Architecture
Basics of computer architecture. RTN, RISC, CISC concepts; computer arithmetic; ALUs; memory systems; I/O. Prerequisite(s): Fulton Schools of Engineering student; CST 364 (CET 364) OR Graduate, Non-Degree, or Post Bac. student

SER 533 Database-Centric Enterprise Applications Development
Solutions for enterprise software systems based on relational database technology. Persistence solutions in middleware frameworks. O/R, XML, and scalability issues. Prerequisite(s): Graduate student (degree seeking or non-degree seeking); Minimum University Cum GPA 3.0; CST 433

SER 580 Practicum
Structured practical experience in a professional program, supervised by a practitioner and/or faculty member with whom the student works closely.

SER 583 Fieldwork
Structured, supervised field experience in a field science or other discipline requiring experience in field techniques. Pre-requisite: Graduate student (degree seeking or non-degree seeking); Minimum University Cum GPA 3.0

SER 584 Internship
Structured practical experience following a contract or plan, supervised by faculty and practitioners.

SER 590 Reading and Conference
Independent study in which a student meets regularly with a faculty member to discuss assignments. Course may include such assignments as intensive reading in a specialized area, writing a synthesis of literature on a specified topic, or writing a literature review of a topic. Prerequisite(s): degree- or non-degree-seeking graduate student

SER 592 Research
Independent study in which a student, under the supervision of a faculty member, conducts research that is expected to lead to a specific project such as a thesis or dissertation, report, or publication. Assignments might include data collection, experimental work, data analysis, or preparation of a manuscript. Pre-requisite: Graduate student (degree seeking or non-degree seeking)

SER 593 Applied Project
Preparation of a supervised applied project that is a graduation requirement in some professional majors. Prerequisite(s): degree- or non-degree-seeking graduate student

SER 594 Conference and Workshop
Topical instruction, usually in compressed format, leading to academic credit. Often offered off campus to groups of professionals. Pre-requisite: Graduate student (degree seeking or non-degree seeking)

SER 595 Continuing Registration
Used in situations where registration is necessary but where credit is not needed. Replaces arbitrary enrollment in reading and conference, research, thesis, dissertation, etc. Used by students when taking comprehensive examinations, defending theses or dissertations, or fulfilling the continuous enrollment requirement in doctoral programs. Credit is not awarded, and no grade is assigned. Prerequisite(s): degree- or non-degree-seeking graduate student

SER 598 Special Topics
Topical courses not offered in regular course rotation--e.g., new courses not in the catalog, courses by visiting faculty, courses on timely topics, highly specialized courses responding to unique student demand. Prerequisite(s): degree- or non-degree-seeking graduate student

SER 599 Thesis
Supervised research focused on preparation of thesis, including literature review, research, data collection and analysis, and writing. Prerequisite(s): degree- or non-degree-seeking graduate student

The following graduate courses are commonly offered by software engineering program faculty:

SER 594 Conference and Workshop
- Game Based Learning
- Human Computer Interaction
- Semantic Web

SER 598 Special Topics
- Advance Graphics
- Embedded C
- Game Engine Architecture
- Mobile Systems
- Web Application Programming

Software Engineering Faculty

Ruben Acuna, M.S.; Lecturer
Arizona State University (CS)
Databases, bioinformatics, scientific data management.

Ashish Amresh, Ph.D.; Assistant Professor
Arizona State University (CS)
Graphics software engineering, game development, computer aided geometric design, software tools to improve game-based learning.

Ajay Bansal, Ph.D.; Senior Lecturer
The University of Texas Dallas (CS)
Programming languages, logic programming systems, software engineering, automated reasoning, and knowledge representation.

Srividya Bansal, Ph.D.; Assistant Professor
The University of Texas Dallas (CS)
Semantic-based approaches to big data integration, Web service description, discovery and composition, and tools for outcome-based instruction design in STEM education.

John Femiani, Ph.D.; Assistant Professor
Arizona State University (CS)
Computer graphics, computer vision, pattern recognition, and image processing.

Ashraf Gaffar, Ph.D.; Assistant Professor
Concordia University (CS, SE)
Software complexity, human cognitive abilities, human centered design, and usability engineering.

Kevin Gary, Ph.D.; Associate Professor
Arizona State University (CS)
Software Architecture, agile methods, open source software. Applications in healthcare and e-learning.

Arbi Ghazarian, Ph.D.; Assistant Professor
University of Toronto (CS)
Software engineering, software requirements engineering, software traceability, software maintenance and evolution.

Timothy Lindquist, Ph.D.; Professor
Iowa State University (CS)
Mobile computing and frameworks to support mobile applications, software engineering, and software engineering for distributed and mobile applications.

Anshuman Razdan, Ph.D.; Professor
Arizona State University (CS)
Computer aided geometric design, computer graphics, NURB curves and surfaces, 3D feature extraction, segmentation, and pattern recognition.

Sohum Sohoni, Ph.D.; Assistant Professor
University of Cincinnati (CE)
Computer architecture and computer performance analysis, cache, and memory-intensive applications, engineering education.

Richard Whitehouse, M.S.; Senior Lecturer
University of Tennessee (CS)
Software engineering, distributed web-based applications, computer aided educational systems.