



**Graduate student handbook**  
**Manufacturing Engineering,**  
**MS**

 2022-2023

 School of Manufacturing Systems and Networks

 [msn.engineering.asu.edu/graduate](https://msn.engineering.asu.edu/graduate)

**MS Manufacturing Engineering  
2022-2023 Handbook**

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# MS Manufacturing Engineering

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## Program Overview

The Master of Science (MS) in Manufacturing Engineering in the School of Manufacturing Systems and Networks is a cross-disciplinary degree in which aspects of several traditional engineering disciplines have been integrated into a curriculum designed to develop technical maturity coupled with the capacity to approach complex problems in an effective and systematic manner. The curriculum reflects the diversity of the faculty and is aligned with the philosophy of the School of Manufacturing Systems and Networks, in which diverse specialists focus their talents on highly complex and nuanced problems, the solution of which requires more than a single disciplinary perspective.

Engineers collaborate on interdisciplinary teams to design, manufacture and deliver innovative technological products and services. The graduate program enables students to develop not only sophisticated engineering technical skills but also the important professional skills of communication, teamwork and collaboration, and the adaptability that many employers seek. Graduates are prepared to work in large corporations, government agencies, small businesses, as well as to pursue advanced degrees. Due to the emphasis on design and project-based learning, the program supports an entrepreneurial spirit, and some students start companies of their own.

## Admissions

Admission to the MS in Manufacturing Engineering program requires the completion of all general admission requirements and procedures set forth by Graduate Admission Services. For general information on applications, deadlines, international requirements, application requirements, and other information, please see [Graduate Admission Services](#). Prior to submitting an application to Graduate Admission Services, applicants should review the information provided in this handbook regarding the degree program, including specific application requirements and deadlines.

### *Submission of an Application*

For admission information and procedures, review the [How and When to Apply For Graduate Admission](#) website. Applications for all graduate degree programs and non-degree status must be submitted via the [application website](#).

Admitted students who are unable to start their programs in their admitted term can request to defer their start to the next admissible semester. Students may submit a request to defer through their MyASU.

### *Application Deadlines*

The dates noted are priority deadlines for submitting a complete application. Applications received after this date may still be considered but are not guaranteed to be evaluated for the semester of application.

**Fall semester** (August)

April 1

### ***Admission and Eligibility***

Admission to the MS in Manufacturing Engineering program requires completion of a Bachelor of Science degree in an engineering discipline or a closely related field from a regionally accredited institution or the equivalent of a U.S. bachelor's degree from an international institution that is officially recognized by that country in engineering, physical sciences, mathematics or a similar field.

Applicants must meet the following admission requirements:

- Minimum of a 3.00 cumulative GPA (scale is 4.0=A) in the last 60 hours of a student's first bachelor's degree program.
- Minimum of 3.00 cumulative GPA (scale is 4.00=A) in graduate work, if applicable
- Applicants with grades below the minimum level may be considered for provisional admission if there is strong evidence suggesting the potential of outstanding performance in the School of Manufacturing Systems and Networks graduate program.

A complete MS Manufacturing Engineering application for admission includes the following items:

- An online **Graduate Admission** application, including attachments of the following documents:
  - A professional resume
  - A statement of purpose
- Transcripts from each college and/or university attended
  - Unofficial transcripts can be uploaded directly to the online application. Official transcripts will be required if admitted.
- International applicants must also meet the **English proficiency requirements**, as defined by Graduate Admission Services. Please be sure to review the **TOEFL, IELTS, Duolingo, or PTE score requirements**, as International applications will not be processed without valid proof of English proficiency.

Academic units submit recommendations regarding admission decisions to Graduate Admission Services; only the Dean of Graduate Admission can make formal offers of admission. Applicants are able to monitor the status of their application through **My ASU**. If admitted, the formal letter of admission can be downloaded from My ASU. If denied admission, letters are sent via email to the address on record.

If the applicant does not meet the minimum GPA requirements, the application may still be considered. In certain cases, demonstrated aptitude through professional experience or additional post baccalaureate education will be considered.

In rare cases, provisional or probationary admission may be granted to the MS in Manufacturing Engineering program. Students in this category may be assigned deficiency courses, additional GPA requirements, or both. The conditions of probationary admission are discussed in more detail in the section on Grades and Academic Performance requirements later in this document.

### ***Financial Aid***

Several resources are available to help students understand how to finance a graduate degree. We recommend visiting **Pay for your Graduate Education** via Graduate College, and **Paying for College** via Financial Aid and Scholarship Services. For an estimated cost of enrollment, visit: **Standard Cost of Attendance**.

Assistantships are very limited at the master's level. If assistantships are available, the positions are managed within the program's department. Interested students should discuss their research interests with engineering faculty members.

### ***Deficiency or Provisional Admission***

Upon admission, a student may be assigned one or more deficiency courses to complete in addition to the 30 credit hour requirement for the MS Manufacturing Engineering program.

Students should refer to their admit letter to verify any assigned deficiencies. Deficiencies must be completed by the end of the first year with a grade of B or better, unless otherwise noted, but it is highly encouraged that deficiencies are taken within the first semester.

Students admitted with provisional admission must successfully complete their first year with a 3.0 GPA or better. A student's inability to meet this requirement may result in immediate dismissal from their graduate program.

## **Program Requirements**

The MS in Manufacturing Engineering requires a minimum of 30 credit hours. An award of the MS in Manufacturing Engineering degree requires the completion of a prescribed curriculum and the completion of a graduate culminating experience. These credit hours must include the following:

### **Required Core Courses** (9 credit hours)

- EGR 520 Engineering Analysis (3)
- EGR 598 Manufacturing Systems Management (3)
- EGR 522 Statistics for Quality Control in Manufacturing (3)

### **Elective Courses** (15-21 credit hours)

Depending on the culminating experience selection, students will need to select 15-21 additional credits of coursework to support the student's interests and specialization. Acceptable courses include 500-level courses with a prefix of MFG, ALT, or EGR. Example classes for electives include:

- EGR 525 Lean Systems
- EGR 581 Simulating Manufacturing Systems
- MFG 598 Design for Additive Manufacturing
- MFG 598 Micro/Nano Additive Manufacturing
- MFG 598 Polymer Science in Additive Manufacturing
- MFG 598 Metal Additive Manufacturing
- MFG 598 Scalable Nano-Manufacturing

## MAE 598 Modern Manufacturing Methods

The formal approval of elective course selection is accomplished through submission and approval of a Plan of Study, and students are encouraged to complete this document during their first semester to ensure that the desired courses meet the curricular requirements. In general, these courses may be chosen from the available graduate offerings within the engineering program at the School of Manufacturing Systems and Networks, from other Engineering programs within the Fulton Schools, or other approved advanced courses in Mathematics, Physical or Biological Sciences. With approval, EGR 592 Research and EGR 590 Reading and Conference is typically allowable one time on the plan of study and cannot be identical to project or thesis work.

Please note that courses offered through other Engineering programs within the Fulton Schools of Engineering traditionally require override approval. This program allows a maximum of 6 credits of coursework from other Engineering programs within the Fulton Schools of Engineering. Consult the School of Manufacturing Systems and Networks graduate academic advisor with override questions. ***Non-engineering courses may not be used to fulfill the requirements of this degree.***

### **Culminating Experience (0-6 credit hours)**

There are three options for the culminating experience:

Portfolio (0 credits)

EGR593 Applied Project (3 credits)

EGR599 Thesis (6 credits)

<b>Culminating Experience</b>	<b>Required Credits</b>	<b>Elective Credits</b>	<b>Culminating Experience Credits</b>	<b>Total Credits</b>
Portfolio	9	21	0	30
Applied Project	9	18	3	30
Thesis	9	15	6	30

## **Culminating Experience Overview**

### **Portfolio**

This is the default option for all students enrolled in the MS Manufacturing Engineering program. To complete the MS Manufacturing Engineering degree under these requirements, a student must complete a total of 30 credit hours of approved coursework and, in the semester the student intends to graduate, submit a portfolio to the Graduate Program Chair within the submission window noted below.

The portfolio must elucidate the quality of the education that the student has received through the course of study. The purpose of the portfolio is to demonstrate a high level of mastery of the principles and practice of engineering through a compilation of work that the student has completed through the course of their graduate study. While the specific details will vary, all portfolios must

describe three notable projects or academic accomplishments that have been completed through the course of graduate study that illustrate the evolution and advancement of technical expertise and mastery of the field of engineering achieved by the student. The portfolio is a professional document that is written in APA or IEEE style (minimum of 10 pages) and will be reviewed and evaluated for both technical content and the quality of writing and presentation.

The required dates for submission of the portfolio are given in the table below:

<b>Graduation Semester</b>	<b>Submission window</b>	<b>Resubmission (if required)</b>
Spring	March 1 to 30	Before April 30
Summer	June 1 to 30	Before August 7
Fall	October 1 to 30	Before December 7

Detailed requirements and the evaluation rubric that will be used to grade the portfolio are given in the appendix of this document.

### **Applied Project**

To complete the MS Manufacturing Engineering degree under these requirements, a student must complete a total of 27 credit hours of approved coursework with a GPA of 3.0 or higher, coupled with the completion of an Applied Project (EGR 593).

A student completing the Applied Project will be supervised by a School of Manufacturing Systems and Networks program faculty member or a qualified faculty member from outside of the program who has been approved by the Graduate Program Chair and the Graduate College. Consequently, to complete an Applied Project a student must first obtain approval of a faculty member to work with them on a project, and subsequent approval of the Graduate Program Chair. The faculty advisor is then responsible for specifying the requirements of the project and for reviewing and approving the final report.

The Applied Project is a demonstration of application of the theory of engineering to solve a practical technical problem of general interest. The subject matter of an Applied Project is more flexible than that of a thesis since the result is not expected to be published, although the project may directly or indirectly support research programs. The faculty advisor has responsibility for establishing the requirements of the project and for approval of the final written report. However, in all cases, the student must prepare and present the applied project to the faculty advisor and discuss the implementation and results of their project. This presentation will be open to all graduate students. A student will be considered eligible for graduation when the sponsoring faculty member approves the report and the presentation and a grade of B or better is assigned on the EGR 593 course.

### **Thesis**

To complete the MS Manufacturing Engineering degree under these requirements, a student must complete a total of 24 credit hours of approved coursework with a GPA of 3.0 or higher, coupled with the thesis (EGR 599).

This option requires students to participate with faculty to carry out original research. A member of the EGR graduate faculty must agree to serve as the faculty advisor before a student can choose to enroll in this option. This will require a written (including email) confirmation from the faculty advisor that they are agreeing to serve in this capacity. The student, in consultation with the faculty advisor, must then identify at least two additional faculty members. No less than 50% of the committee must include faculty from the MS Manufacturing Engineering department to serve on the MS in Manufacturing Engineering thesis committee.

A thesis is a document that reflects and reports research that is of sufficient depth and interest that it can be published in a peer reviewed journal in the field of interest. Successful publication of the work reported in the thesis will be considered evidence of peer acceptance of the work. The thesis document should demonstrate original, independent, and creative thought, demonstrate proficiency with written English, and adhere to the Graduate College format guidelines. Upon completion of the Master's thesis, the student is required to defend the research in a public forum.

The requirements for completion of the thesis include a formal format review by the Graduate College, a public announcement of the defense time and location, and submission of a copy of the thesis to committee members at least one week in advance of the defense date. The deadlines for these processes are non-negotiable, and it is the responsibility of the student to be aware of all submission and scheduling requirements. It is also the responsibility of the student to identify a room and ensure all necessary equipment and resources are available for the defense.

Establishing the details of the final defense of the thesis is the responsibility of the faculty advisor. At the beginning of the defense, the advisor will introduce the candidate and explain the exact protocol that will be followed. The candidate will present a brief seminar to the audience that explains their accomplishments. The presentation should not exceed 30 minutes, after which the audience will be allowed to ask questions. At the discretion of the faculty advisor, questions may or may not be allowed during the presentation. The general audience is then dismissed and the supervisory committee continues to question the student in depth. At the conclusion of this questioning, the student is asked to briefly leave the room and the committee discusses whether or not the thesis is acceptable and reports their conclusions on the Report for Master's Thesis Defense form. The student will be asked back into the room and the results of the examination and the subsequent path forward will be explained to the student.

Thesis students must adhere to specific deadlines for the thesis defense and paper submission. At the beginning of the semester a student intends to defend their thesis, they should notify the School of Manufacturing Systems and Networks Graduate Advising office ([msngrad@asu.edu](mailto:msngrad@asu.edu)). Schedule an advising appointment to review key information and deadlines.

You may review Graduate College's [graduation deadlines, procedures, and checklist](#).

## Labs & Research

Learn more about the Manufacturing Engineering labs & research by visiting: <https://manufacturing.engineering.asu.edu/research/>. You may also learn more by visiting the faculty's research pages:

Bruno Azeredo, <https://azeredo.engineering.asu.edu/>  
Dhruv Bhate, <https://3dxresearch.com/>  
Xiangfan Chen, <https://chenlab.engineering.asu.edu/>  
Kenan Song, <https://sites.google.com/site/kenansonglab/home>

## Faculty

Faculty members have significant expertise in many engineering disciplines. Many members of the School of Manufacturing Systems and Networks engineering faculty bring considerable industry experience to bear on their teaching and research. Listed below are engineering faculty involved in research within the focus areas of the MS Manufacturing Engineering program.

### *Manufacturing*

Bruno Azeredo, <https://isearch.asu.edu/profile/3019847>  
Dhruv Bhate, <https://isearch.asu.edu/profile/3186956>  
Xiangfan Chen, <https://chenlab.engineering.asu.edu/author/xfchen/>  
Shenghan Guo, <https://isearch.asu.edu/profile/4001269>  
Keng Hsu, <https://search.asu.edu/profile/2203109>  
Hyunwoong Ko, <https://isearch.asu.edu/profile/4002102>  
Sharon Lewis, <https://poly.engineering.asu.edu/sharon-lewis/>  
Kenan Song, <https://isearch.asu.edu/profile/3185018>  
Binil Starly, <https://search.asu.edu/user/334232>  
Andi Wang, <https://isearch.asu.edu/profile/4001267>

## Academic & Faculty Advising

The School of Manufacturing Systems and Networks Graduate Advising Office is responsible for advising all MS in Manufacturing Engineering students with respect to progress toward the degree as well as program, school, college, and university-wide ASU Policies and Procedures. Questions involving details of academic content in courses, professional practice, and research can be discussed with faculty advisors or the Graduate Program Chair.

### **Graduate Academic Advising**

MSN Graduate Advising  
Sutton Hall, Second Floor  
[msngrad@asu.edu](mailto:msngrad@asu.edu)  
480-727-4723

### **Graduate Program Chair**

Dr. Thomas Sugar  
Professor and Program Chair, Engineering  
Tech 101A,  
[thomas.sugar@asu.edu](mailto:thomas.sugar@asu.edu)  
480-727-1127

# School of Manufacturing Systems and Networks

## Overview

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### About the School of Manufacturing Systems and Networks

The School of Manufacturing Systems and Networks is making a new higher education experience, one that focuses on learning through making things and solving real-world challenges through collaboration. At the School of Manufacturing Systems and Networks, we believe how you learn and teach is as important as what you learn and teach. We are committed and contributing to ASU's vision of the New American University – an institution that is committed to excellence, access, and impact.

The School of Manufacturing Systems and Networks is located in Mesa, which is the state's third-largest city and part of the Greater Phoenix area. The 600-acre ASU Polytechnic campus is built in a beautiful desert arboretum and is home to more than 6,000 students studying in undergraduate and graduate majors. The School of Manufacturing Systems and Networks is home to some of the most innovative engineering and technology programs in the country and some of the most advanced learning laboratories available to students on any university campus.

The programs thrive under the guidance of outstanding faculty members with deep expertise in many of the most important challenges that society faces.

Visit the School of Manufacturing Systems and Networks website at <https://msn.engineering.asu.edu/>. **For more in-depth information about the programs offered through the School of Manufacturing Systems and Networks as well as the application process and other pertinent information, you are encouraged to explore the overview of the graduate programs.**

### Graduate Programs

The School of Manufacturing Systems and Networks' graduate students learn in an environment that blends management, applied sciences, and engineering and technology fields to create applications, systems, and solutions that meet real-world needs. We engage in research that matters. As part of the School of Manufacturing Systems and Networks masters programs, applied projects, theses, and research are degree components and complement students' theoretical and practical understanding. The Manufacturing Systems and Networks doctoral program include separate degree components, all of which are outlined in each program's handbook.

#### **Masters Degrees**

Manufacturing Engineering, MS

#### **Doctoral Degrees**

Systems Engineering, Ph.D.

## Purpose of this Handbook

The purpose of this handbook is to provide guidance and information related to admission, degree requirements, and general policies and procedures for graduate students in the School of Manufacturing Systems and Networks. Students must adhere to policies of both the School of Manufacturing Systems and Networks and the Graduate College. Policies and this handbook are subject to change at any time; students will be notified.

## Student Responsibility

Graduate students are responsible for familiarizing themselves with all university and graduate policies and procedures as well as applicable deadlines. Each student should also communicate directly with his/her academic unit to be clear on its expectations for degree completion. Graduate students are responsible for frequently checking their **My ASU** account and **asu.edu email** for the most up-to-date information regarding their status, holds, items to attend to, and other important information.

## Diversity and Inclusion Initiative at the Ira A. Fulton Schools of Engineering

In January 2019, the Ira A. Fulton Schools of Engineering launched a new initiative focusing on diversity and inclusion — core values to the Fulton Schools and ASU, as exemplified in the university charter. This initiative is called DII@FSE.

Our DII@FSE task force has articulated a vision to follow strategies and practices that support environments where individuals feel included, valued and respected and where different kinds of people can succeed.

The DII@FSE has submitted a proposal to the American Society for Engineering Education's (ASEE) Diversity Recognition Program. That proposal was awarded bronze status (the highest entry status a university can be awarded). Next steps for the initiative will be working together to realize the plan's goals.

### Goals

1. Create and maintain a student body and workforce across the Fulton Schools that is diverse in multiple dimensions and inclusive for all.
2. Empower faculty, staff, students and academic associates at the Fulton Schools to embrace the core values and practice of diversity, equity and inclusion.
3. Be a global leader in diversity, equity and inclusion in engineering.

## Facilities and Labs

The core facilities, laboratories, and centers in the School of Manufacturing Systems and Networks provide the ideal environments for teaching, research, and discovery. State-of-the-art equipment and technologies help students increase their knowledge and experience and provide support for the use-inspired research conducted by the school's faculty and students. Learn more by visiting: **Labs and Facilities**.

## Faculty

Faculty members have significant expertise in many of the most important challenges that society faces. Many members of the faculty bring considerable industry experience to bear on their teaching and research. To learn more about the faculty, you may refer to the [Polytechnic School Directory](#).

## Graduate Advising

Graduate student advising is located on the Polytechnic campus in [Sutton Hall](#) on the second floor. For more information about the School of Manufacturing Systems and Networks School graduate programs or the policies in this handbook, contact the graduate advising office at [msngrad@asu.edu](mailto:msngrad@asu.edu) or 480-727-4723.

## Accelerated Bachelor's + Master's Degree Program (4+1)

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The School of Manufacturing Systems and Networks offers accelerated BS/MS and BSE/MS programs for students currently enrolled in an approved undergraduate program. This allows students to graduate with both degrees within five years of full-time coursework.

If you are interested to see if your program is part of the accelerated (4+1) program offerings, visit [4+1 Degree Programs](#) and contact the School of Manufacturing Systems and Networks Graduate Advising office at [msngrad@asu.edu](mailto:msngrad@asu.edu) to discuss your 4+1 options. Please note that in addition to credit hour requirements, applicants must also have a cumulative ASU GPA of 3.20\* or higher at the time of application to be considered. Admission into the accelerated programs is not guaranteed and an application is required to be considered.

### 4+1 Probation Policy

Students in the School of Manufacturing Systems and Networks accelerated bachelor/masters programs are required to have/maintain a minimum 3.2 cumulative undergraduate ASU GPA on a 4.0 scale, at the time of the 4+1 agreement, upon graduate admission, and through the completion of the undergraduate degree requirements. In addition, students in the accelerated bachelor/masters programs are also required to maintain a 3.0 GPA for all coursework on the graduate plan of study (including shared 400-level courses) and all 500-level coursework.

Shared coursework is defined as the courses being applied toward the bachelors degree and also being utilized for credit in the masters program. Shared courses are identified on the 4+1 Agreement that must be completed prior to starting the 4+1 program.

Students in the accelerated program who, upon their undergraduate graduation date, do not maintain a minimum 3.2 cumulative undergraduate ASU GPA on a 4.0 scale are allowed to continue into the graduate portion of the accelerated program, but cannot share the credits from their undergraduate degree. Students in this situation must still complete the full requirements of their respective graduate degree.

Students in the accelerated program who do not maintain a 3.0 minimum GPA in their shared coursework will be placed on graduate probation upon entering the masters degree program.

Students in this situation will be notified of their probation status and the steps needed to lift the probation.

Students who do not satisfy either GPA requirement are placed on graduate academic probation upon entering the masters program and cannot share the credits from their undergraduate degree. Students in this situation must still complete the full requirements of their respective graduate degree and will be notified of their probation status and the steps needed to lift the probation.

## Academic Standards and Policy

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### Grades

To be eligible for graduation and the completion of a graduate degree, a student must achieve a cumulative grade point average (GPA) of 3.0 or better in three different grade point average calculations. The three different grade point averages that are considered by Graduate College and the School of Manufacturing Systems and Networks are as follows: **(1)** the grade point average in all courses numbered 500 or higher that appear on the transcript, except those that were listed as deficiencies in the original letter of admission, **(2)** the grade point average in all coursework that appears on the approved program of study, and **(3)** the grade point average in all coursework taken at ASU post baccalaureate.

Transfer credits are not calculated on the Plan of Study (iPOS) GPA or the Graduate GPA. Courses with grades of “D” (1.00) and “E” (0.00) cannot appear on the iPOS but will be included when calculating the Graduate GPA. Courses with an “I” grade cannot appear on the iPOS.

A student who is not progressing satisfactorily toward a degree will be withdrawn from the program by the Dean of the Graduate College upon recommendation by the Fulton Schools of Engineering Dean’s office. The policy of the School of Manufacturing Systems and Networks for academic probation and dismissal of graduate students is outlined below.

Satisfactory progress is defined by the quality of the student’s work, that it does not have any academic and progress probationary issues, and that the student is meeting all requirements and/or milestones applicable to their program. Specifically for Doctoral students, this also includes the successful completion of the qualifying and comprehensive exams, as determined by their program. In addition to the probationary rules, satisfactory progress includes appropriate communication each semester with the student’s Committee Chair regarding his or her progress, if applicable.

Students in the accelerated degree programs (4+1) will have separate requirements to meet while completing their undergraduate degree. See accelerated bachelor’s + master’s degree program (4+1) section above for more information. Once students are in the graduate portion of the program (and have completed their undergraduate degree), they must meet the graduate academic expectations outlined in this section.

## Academic Performance Standards

To meet the School of Manufacturing Systems and Networks academic performance requirements, all students admitted to a graduate degree program in the School of Manufacturing Systems and Networks must adhere to all of the following:

All students admitted to a graduate degree program in the School of Manufacturing Systems and Networks, 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. Coursework in the student's approved plan of study (iPOS), **and**
3. All course work taken at ASU (overall GPA) post baccalaureate.

Earn a "C" or better in all iPOS (plan of study) courses. Grades of "W" and "I" are not acceptable on the iPOS and may be considered lack of satisfactory progress if more than one occurrence during the students' graduate program of study. Programs may invoke a higher standard, e.g., no courses with a C may be included on the iPOS.

Meet the terms of the ASU Graduate College satisfactory progress policies as outlined at: **ASU Graduate Policies and Procedures**.

## Evaluation of Academic Performance Requirements

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

- **Satisfactory Progress** means that the student does not have any academic and progress probationary issues. In addition to the probationary rules, satisfactory progress includes appropriate communication each semester with the student's Committee Chair regarding his or her progress, if applicable.
- **Academic Probation** pertains to grades that fall below those required by Program and University policies, including graduation requirements. The following are notices/letters the student will receive if one of these pertains to their academics:

### Grade Point Average

- > GPA below 3.0 in approved iPOS courses
- > Overall post baccalaureate GPA below 3.0
- > Overall graduate (500 level or above) GPA below 3.0

Students placed on academic probation will have nine (9) credits or one year, whichever comes first, to meet GPA requirements as outlined above. Students placed on academic probation for Satisfactory Academic Progress will be provided a deadline within their probationary notice in which the requirements are to be met.

- A student will be recommended for **Withdrawal** from the program if she or he fails to meet the probationary standards outlined in their probationary letter. The student will receive a letter from the School of Manufacturing Systems and Networks explaining the reasons for

recommendation for withdrawal. The student will have five (5) business days from the date of the letter to appeal the decision. The department's Graduate Affairs Committee (GAC) will review the appeal and will make the necessary recommendation. The GAC Chair, on behalf of the GAC, will provide a written explanation of the outcome of the appeal.

- 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 of the GAC and the consequences if the agreements are not met.
  - If the GAC recommends that the appeal is not granted in favor of the student, the GAC Chair, on behalf of the GAC, will recommend to the Fulton Schools of Engineering (FSE) Dean's Office to withdraw the student from the graduate program. The student's appeal will then be reviewed by the FSE Academic Standards Committee, which reviews the student's case and makes the final recommendation on behalf of the FSE Dean's Office and the department. If the appeal is not granted in favor of the student, the Fulton Schools of Engineering Dean's Office will recommend to the Graduate College to withdraw the student from the graduate program. Please refer to the Graduate College catalog for policies and procedures or contact the graduate advisor in the School of Manufacturing Systems and Networks with further questions.
- A student will be recommended for ***Withdrawal*** from the program if they fail to meet the provisional admission requires outlined within their admission letter. The student will receive a notice from the School of Manufacturing Systems and Networks explaining the reasons for recommendation for withdrawal. The withdrawal notice will be submitted to the ASU Graduate College for processing. Provisional admits are unable to appeal if they fail to meet requirements outlined within the standards of their admission.
  - A student will be recommended for ***Withdrawal*** from the program if they fail to meet the deficiency admission requires outlined within their admission letter. The student will receive a letter from the School of Manufacturing Systems and Networks explaining the reasons for recommendation for withdrawal. The withdrawal notice will be submitted to the ASU Graduate College for processing. Students not meeting the admission requirements of their deficiency as outlined in their admission letter are granted the ability to appeal and follow the process noted above. If appeal is unsuccessful, the withdrawal notice will be submitted to the ASU Graduate College for processing.
    - **Deficiency Course(s)**
      - Lack of progress toward completion of required deficiencies as listed on the admission letter
      - 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

## Plan of Study (iPOS)

The Plan of Study (iPOS) functions as a contract between the student, the academic unit, and the Graduate College. The iPOS contains certain degree requirements such as core and elective coursework as well as a culminating experience, which must be included in the iPOS before it can be approved. Students should submit an iPOS after registering for their second semester in the program. Students **must** submit an iPOS before the beginning of their second semester of their degree program. A student is not eligible to schedule the comprehensive examination without an approved iPOS. Students may not register for applied project (593), thesis (599), internship (584), or dissertation credit (799) until their iPOS is submitted and approved.

A student can access the iPOS by visiting [My ASU](#) > My Programs > iPOS > Graduate Interactive Plan of Study (iPOS). Please reference our [iPOS Overview](#) for in-depth information on what must be included on the iPOS.

## Time Limit for Degree Completion

All work toward a master's degree must be completed within six consecutive years. Doctoral students must complete all program requirements within a ten-year period. The time period 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. See the [ASU Graduate Policies and Procedures](#) for more information.

## Continuous Enrollment Policy

Once admitted to a graduate degree program, students must be registered for a minimum of one credit hour of graduate-level coursework (not audit) during each fall and spring semester of their graduate education. Summer registration is required for students taking examinations, completing culminating experiences, conducting a doctoral prospectus, defending theses or dissertations, or graduating from the degree program in that semester. 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.

Students who have completed all necessary coursework but still need to complete their culminating experience can [request an override](#) for 595 Continuing Registration for 1 credit hour to maintain active status in their program. First term requests are sent to the student's committee chair to approve and verify that the student is making adequate progress. If a second term request is necessary, along with the override request the student must submit a timeline of remaining requirements to verify how they plan to complete the program in that semester. Below is an example timeline:

Completion of on Introduction, Literature Review, Methodology - August 31

Distribution of survey - September 1 - 30

Analysis of data and write up of Data Analysis and Conclusion chapters- October 1-31

Defense of thesis – November

## Leave of Absence Policy

Students planning to discontinue enrollment for a semester or more must request approval for a leave of absence through the Plan of Study (iPOS) petition titled *Request to Maintain Continuous Enrollment*. The Graduate College allows for a leave of absence for a maximum of two semesters during a student's entire program. A petition for a leave of absence may be submitted through a student's interactive plan of study and must be approved by the Graduate College. This request must be submitted and approved **before** the start of the semester of the anticipated absence.

An approved leave of absence will enable students to re-enter their program without reapplying to the university and the graduate program. Students who do not enroll for a fall or spring semester and do not have an approved Request to Maintain Continuous Enrollment 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 with a Graduate College-approved Request to Maintain Continuous Enrollment is not required to pay tuition and/or fees, but in turn is not permitted to place any demands on university faculty or use any university resources. See the **ASU Graduate Policies and Procedures** for more information.

## Graduate College Policies and Procedures

All graduate students are expected to read, understand and meet the terms of the ASU Graduate College Policies and Procedures handbook as outlined at: **ASU Graduate Policies and Procedures**.

## Policy on Maximum Course Load

Registration in nine (9) credits is considered a full-time load for graduate students at ASU, and graduate students in the Ira A. Fulton Schools of Engineering are restricted to a maximum of 12 credits per semester. Overrides to register for more than 12 credits require the approval of the student's committee chair and Graduate Program Chair and will be granted only in exceptional cases. Requests to register for more than 15 credits will not be supported.

## Internships

The School of Manufacturing Systems and Networks graduate students can request to take internship as a 584 course option for academic credit if an approved and eligible internship is obtained. Internship is not a requirement for graduate programs within The School of Manufacturing Systems and Networks, but can be added as a planned option to the graduate plan of study. International students can apply for curricular practical training (CPT) if eligible to do so. No more than 3 credits of internship coursework can be used. The 3 credits can be divided between a maximum of two semesters for two different internship opportunities. For more information on internships, policies, and the application process, please visit: **<https://poly.engineering.asu.edu/advising/internships/>**.

## **Applying for Graduation**

Graduate students should become familiar with the process of applying for graduation to ensure the **graduation application** is submitted by the deadline of the graduating semester. The University has specific deadlines each semester for submitting the Graduation application. To view the specific deadlines for future terms, log into MyASU and click on the Graduation tab. Please also be sure to review the Graduate College **graduation deadlines and procedures** as well. All students must have an approved and up-to-date iPOS on file in order to apply for graduation.

## **Culminating Experience Definitions – Master’s Degrees**

Below is an overview of the culminating experience options offered within the School of Manufacturing Systems and Networks’ graduate programs. Culminating experience options vary by program.

### **Portfolio**

The portfolio is a highlight of three major accomplishments from the master's program, and may include projects, papers, exams. Portfolio submission includes resume, reflection of graduate program accomplishments with the supporting assignments/ projects included. Reviewed by program chair for consistency in grading. There are specific submission timeframes (Spring - March/ Summer - June/ Fall - October) noted in the program section for eligible programs.

A cover page needs to be included describing what courses the projects were carried out in, and why they were selected for inclusion in the Portfolio by the student. The Committee Chair and/or the Graduate Program Chair will be solely responsible for judging the quality of the portfolio and determining if it is satisfactory to serve as the required culminating event for the degree.

### **Applied Project**

The applied project is carried out under the supervision of a faculty member, typically a member of the program’s graduate faculty. Students are not assigned a faculty advisor. Students must take initiative to contact a faculty member working in their area of interest. Students desiring to conduct an applied project must first obtain the approval of a faculty member to work with them on the project. This is recommended to be done before the end of the second semester (by +1 year for accelerated students). Enrolment in the applied project is in the last semester of the graduate program. Applied projects are not required to be connected with industry.

At completion of the applied project, a written document is required. Document is less involved than a thesis and is not expected to be published. More generalizable in comparison to thesis, flexibility in final format. In all cases, the student must prepare and present the applied project to the faculty advisor and discuss the implementation and results of their project. This presentation will be open to all graduate students.

Credit is earned when the faculty advisor approves the written report and oral presentation and a grade of B or better is awarded. For students carrying out an applied project, the faculty chair is the

faculty advisor for the project. The applied project committee consists only of the faculty chair. A grade of 'Y' is not considered satisfactory completion of the course by the ASU Graduate College.

### **Thesis**

Thesis is a large research commitment, recommended for those wanting to pursue a PhD or a career focused in research. Work involves a new research area or extension of previous research, taking a new approach to a topic. The thesis topic can be initiated by either the student or the faculty advisor. Students must adhere to Graduate College (GC) policies, formatting requirements, and deadlines. Final document is published through ProQuest through the GC processes.

Students are not assigned a faculty advisor. Student must take initiative to contact a faculty member working in their area of interest. This should be done as soon as possible, but no later than the second semester of study. For 4+1 students, the faculty advisor should be identified by the end of the last semester of the bachelor's degree completion. Enrollment in 599 must be in the last two semesters of the program.

Thesis grading is pass/fail. Students may receive 'Pass with minor or major revisions' post-defense, but ultimate grade will be pass/fail. Students must have pass/fail form submitted to Graduate College within 10 days of defense, and as soon as any required revisions are accepted by committee. **GC deadlines** should be adhered to closely. The committee must consist of three faculty (one chair, two members or two co-chairs, one member) approved by the Graduate Program Chair and Graduate College and must consist of no less than 50% of faculty from the department, including the chair or one co-chair. The thesis defense will be open to all graduate students and faculty.

## **General ASU Information**

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### **Academic Calendar**

Students are responsible for meeting all deadlines set within the ASU Academic Calendar. The calendar can be found at [students.asu.edu/academic-calendar](https://students.asu.edu/academic-calendar).

### **Student Code of Conduct**

The aim of education is the intellectual, personal, social, and ethical development of the individual. The educational process is ideally conducted in an environment that encourages reasoned discourse, intellectual honesty, openness to constructive change, and respect for the rights of all individuals. Self-discipline and a respect for the rights of others in the university community are necessary for the fulfillment of such goals. The Student Code of Conduct is designed to promote this environment at Arizona State University.

The Student Code of Conduct sets forth the standards of conduct expected of students who choose to join the university community. Students who violate these standards will be subject to disciplinary sanctions in order to promote their own personal development, to protect the university community, and to maintain order and stability on campus.

All students are expected to adhere to the **ABOR Student Code of Conduct**.

## Academic Integrity

The highest standards of **academic integrity** and compliance with the university's Student Code of Conduct are expected of all graduate students in academic coursework and research activities. The failure of any graduate student to uphold 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 the School of Manufacturing Systems and Networks as well as the University.

Violations of academic integrity include, but are not limited to: cheating, fabrication of data, tampering, plagiarism, or aiding and/or facilitating such activities. At the graduate level, it is expected that students are familiar with these issues and take personal responsibility in their work. It is the student's responsibility to become familiar with the academic integrity policies of the university and Graduate College.

## Department and University Resources

- Academics and Professional Development
  - Academic Integrity Policy
  - ASU libraries
  - Career Centers (both ASU and Fulton Schools of Engineering)
  - Graduate and Professional Student Association
  - FSE student resources
  - Professional development
  - Writing Center
  
- Student Support Services
  - Counseling
  - Student Accessibility and Inclusive Learning
  - Graduate Wellness Resources
    - 10 Best Practices in Graduate Student Wellbeing
  - Health
  - Housing
  - International Student Services
    - FSE International Student Resources
  - Veterans
  
- Business and Finance Services
  - ASU ID cards
  - ASU bookstore
  - Parking and Transit
  - Student accounts

## Contact Information

For more information about the School of Manufacturing Systems and Networks graduate programs or the policies in this handbook, contact the graduate advising office at [msngrad@asu.edu](mailto:msngrad@asu.edu) or 480-727-4723.

## **Appendix A**

### **Instructions for the MS in Manufacturing Engineering Portfolio**

# Instructions for the MS in Manufacturing Engineering Portfolio

## Purpose of the Portfolio

The purpose of the portfolio is to demonstrate a high level of mastery of the principles and practice of engineering through a compilation of work that you have completed throughout the course of your graduate study. While the specific details will depend on your specialization, all portfolios must describe three (3) notable projects or academic accomplishments that you have completed during your time in the graduate program that illustrate the evolution and advancement of your technical expertise and mastery of the field of engineering.

## Portfolio Format

The portfolio is a professional document that is written in APA or IEEE style, and will be reviewed and evaluated for both the technical content and the quality of writing and presentation. The format of the portfolio must be as follows:

1. **Cover page**
2. **Resume** – An up-to-date resume reflecting your accomplishments to date.
3. **Overview** – A brief description of the three notable accomplishments that you achieved during your graduate experience that will be highlighted in the portfolio along with why they have been chosen. This section is typically three or four paragraphs.
4. **Accomplishments** – Document each of your three chosen topics as follows:
  - a. Title of Topic.
  - b. An explanation of the accomplishments that the topic is illustrating.
  - c. A reflection on why you consider this to be significant.
  - d. Evidence of accomplishment. In this section, include materials such as project reports, results of exams and homework, or other related materials.
  - e. A summary that demonstrates your mastery of the subject by referring to the evidence presented in section 4d. (The summary is typically a few paragraphs in length.)

*\*If a specific class had multiple noteworthy projects, two of these projects can be used, but at least two classes must be represented in the portfolio.*
5. **Reflections** – A short reflection on your graduate experiences and how the accomplishments you have chosen to highlight in your portfolio illustrate the level of achievement that you attained as you progressed through the program. This section is typically about one page.

## Submission Instructions

The portfolio must be submitted electronically to the graduate program chair as a single PDF document along with a copy of the *Record of Evaluation of the MS Manufacturing Engineering Graduate Portfolio* that includes your name, ASU ID number, submission date and the attempt number.

## Deadlines for Submission

Graduation Semester	Submission window	Resubmission (if required)
Spring	March 1 to 30	Before April 30
Summer	June 1 to 30	Before July 20
Fall	October 1 to 30	Before December 7

## Evaluation

The evaluation rubric for the portfolio is given on the *Record of Evaluation of the MS Manufacturing Engineering Graduate Portfolio* form, which is shown on the next page of this document. The portfolio is complete only when *all* sections reflected on this rubric are deemed satisfactory. The graduate program chair or their representative is responsible for evaluation of the portfolio and will notify you of the result within two weeks of submission of the document.

There are four possible outcomes of the evaluation:

1. The portfolio is accepted as submitted.
2. The portfolio is returned to you for minor corrections as specified by the graduate program chair or their representative, followed by resubmission.
3. The portfolio is returned to you for major changes. In this case, the graduate program chair or their representative will meet with you and specific instructions will be communicated regarding the steps that will necessary for the portfolio to be accepted.
4. The portfolio is returned without critical evaluation because of errors in spelling, grammar, or format.

## Completion

Completion of the graduate portfolio is formally recognized when the graduate program chair acknowledges the achievement by signing the *Record of Evaluation of the MS Manufacturing Engineering Graduate Portfolio* form and the signed form is transmitted to the graduate advising office at the Polytechnic campus. Upon receipt of the signed form, the graduate advising office will update your records to indicate completion of the culminating experience and eligibility for graduation. If you do not complete the graduate portfolio by the end of the semester in which you complete all other requirements for the degree, your degree will not be posted until the program chair signs the form.

## Process for Appeal

In the event that you disagree with the evaluation of your portfolio, you may request a second evaluation by faculty that were not previously involved in the process. To initiate the appeal process, a formal request for a second review must be submitted via email to the graduate advising office to be reviewed by the Graduate Affairs Committee along with a copy of the same portfolio that was submitted earlier to the graduate program chair. If the Graduate Affairs Committee recommend that it be accepted, the graduate program chair will accept that recommendation. If the Graduate Affairs

Committee does not recommend that the portfolio be accepted, you must modify the portfolio and resubmit it based on the earlier communication from the graduate program chair.

# Record of Evaluation of MS Manufacturing Engineering Graduate Portfolio



The School of Manufacturing Systems & Networks

Student Name \_\_\_\_\_ ID number \_\_\_\_\_

Semester/Year \_\_\_\_\_ Attempt Number \_\_\_\_\_ Submission Date \_\_\_\_\_

Topic	Satisfactory	Unsatisfactory
Spelling, Grammar and Presentation		
Format		
Required Elements:		
Cover Page		
Resume		
Overview		
Project 1		
Project 2		
Project 3		
Reflections		

If applicable, explanation of unsatisfactory marks:

RESULT <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	EVALUATOR NAME AND SIGNATURE  DATE
RESULT <input type="checkbox"/> PASS <input type="checkbox"/> FAIL	PROGRAM CHAIR NAME AND SIGNATURE <b>Dr. Thomas Sugar</b> DATE