SEATTLE UNIVERSITY MECHANICAL ENGINEERING UNDERGRADUATE STUDENT HANDBOOK

2023

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The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Mechanical and Similarly Named Engineering Program Criteria.

Contents

1. INTRODUCTION

The *Mechanical Engineering Undergraduate Student Handbook* was written to assist current and prospective mechanical engineering students in planning their program of study, leading toward the degree of Bachelor of Science in Mechanical Engineering (BS.MEGR) at Seattle University. The handbook is updated periodically to include the latest information on degree requirements and university procedures that are of interest to mechanical engineering students.

The mechanical engineering undergraduate curriculum emphasizes a four-year integrated scientific, hands-on learning, and design experiences while increasing communication opportunities, mentoring by practicing engineers, encouraging both independent and collaborative learning, fostering an inclusive culture, and developing skills needed to function on multi-disciplinary teams in professional setting. The total number of quarter credit hours required for the degree is 180.

Throughout this handbook, links are made to pertinent websites. Below is a list of general websites that may be of the greatest interest to students.

- Mechanical Engineering Department's web page-includes information about the ME Department including contact information for faculty and staff.
- Academic Catalog-includes requirements for all programs (major and minor) and course descriptions.
- Redhawk Axis homepage-includes official academic policies, academic forms (e-forms or PDF's), academic calendar, financial services forms and other information. Whenever questions arise, documents at the Redhawk Axis homepage are considered the ultimate authoritative sources concerning university policy.
- College of Science and Engineering Advising Center-staff available to discuss policies and procedures, academic or personal difficulty and help with advising and registration issues. They can direct students to additional university resources.

2. MISSION STATEMENTS

2.1 Seattle University Mission Statement

The vision of Seattle University is to be the premier independent university of the Northwest in academic quality, Jesuit Catholic inspiration, and service to society. The following statement expresses the Seattle University mission:

Seattle University is dedicated to educating the whole person, to professional formation, and to empowering leaders for a just and humane world.

Seattle University strives to help its students develop their talents as well-rounded human beings, prepared to meet life's challenges both to their own benefit and that of society. This goal is accomplished within the Jesuit tradition of liberal education. This tradition at Seattle University is embodied in the Core Curriculum, a course of study shared by all Seattle University students regardless of major. It includes philosophy, religious studies,

social sciences, and humanities. The Department of Mechanical Engineering believes the Core Curriculum, along with a strong engineering education, provides an excellent basis for a rewarding professional life.

2.2 Mechanical Engineering Department Mission Statement

The Mechanical Engineering Department has adopted the following mission statement:

> ***To provide a technically rigorous design-focused education in a collaborative environment that emphasizes individual attention and connections to industry, while preparing students to help create a more just and humane world.***

3. THE MECHANICAL ENGINEERING PROFESSION

Mechanical Engineering is a vibrant field of engineering with a diverse set of professional objectives aimed at improving the quality of life. Traditionally, mechanical engineers are concerned with advancing the understanding of transportation, energy systems, machine design, and manufacturing. However, due to its broad nature, the focus of mechanical engineering has evolved along with the interests and ambitions of society. Mechanical engineers also work in environmentally conscious technologies, advanced manufacturing, bioengineering, medical device engineering, and micro/nanotechnology.

To work in either a traditional or more contemporary area of mechanical engineering requires a well-developed and practiced understanding of the fundamental principles of math and science. At Seattle University, students can learn the important principles in the classroom, the laboratory, and while working on team projects. Former Seattle University students, now employed as mechanical engineers, often tell us that communications skills are some of the most important skills used in the workplace. We provide numerous opportunities for students to improve their writing and presentation skills throughout the curriculum.

Mechanical engineers have numerous career options upon graduation, including product design and testing, systems operation, product management, research and development, and consulting. These broad job descriptions can be realized by working on projects related to pollution prevention and reduction, renewable energy production, engine design, testing the reliability and safety of products, developing advanced control systems, and many more.

4. OBJECTIVES OF THE MECHANICAL ENGINEERING UNDERGRADUATE PROGRAM

The mechanical engineering undergraduate program at Seattle University, in keeping with the University's Mission, seeks to prepare graduates for productive and fulfilling lifelong careers in the engineering profession. It is one of the two programs offered by the Department of Mechanical Engineering. The other program is Master of Science in Mechanical Engineering.

The mechanical engineering undergraduate program's educational objectives are statements that describe the expected accomplishments of our graduates during the first few years after graduation. The specific program educational objectives for the Bachelor of Science with a major in Mechanical Engineering (BS.MEGR) are:

Professional: Attain a position solving real-world problems using mechanical engineering skills and principles developed while studying at Seattle University.

Personal: Participate in ongoing personal and professional growth by actively seeking additional skills and experiences, for example engaging in continuing education and/or pursuing advanced degrees.

Societal: Contribute to society through creating collaborative and inclusive environments and using problem solving skills to make a more just world.

Student outcomes are statements that describe what students are expected to know and be able to do by the time of graduation. At the time of graduation, students from our mechanical engineering program are expected to have:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The typical four-year curriculum to complete the requirements for the Bachelor of Science with a major in Mechanical Engineering is updated regularly.

5. ENGINEERING EDUCATION AT SEATTLE UNIVERSITY

5.1 History of Engineering Education at Seattle University

Seattle University (then called Seattle College) was founded by members of the Society of Jesus in 1891. It was not until 1941, however, that the School of Engineering was organized under the leadership of Fr. Edmund McNulty, S.J. The first baccalaureate degrees in engineering were awarded in 1948.

In 1972 the College of Science and Engineering underwent reorganization, joining with the natural sciences to become the School of Science and Engineering, becoming the College of Science and Engineering in 2004. The College is administered by its dean, supported by assistant and associate deans. In addition to the three undergraduate engineering departments of civil and environmental, electrical and computer, and mechanical engineering, the College houses programs in the natural and health sciences, mathematics, and computer

science. There are also graduate programs in computer science, data science, structural engineering and mechanical engineering. The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Mechanical and Similarly Named Engineering Program Criteria.

Since 1987 the College of Science and Engineering has contained the Seattle University Project Center. Through the Project Center, all senior students in engineering, environmental science and computer science are formed into teams that are given real-world design problems to work on during their final academic year. In most cases, the projects are provided and sponsored by companies from local industry. Each company also provides a working engineer to act as a technical advisor to the student team. A faculty member acts to facilitate the process and to evaluate the students' efforts. We feel that this experience gives our students a strong bridge between the academic and working worlds and that it goes a long way toward fulfilling the mission of the university.

6. MECHANICAL ENGINEERING DEGREE PROGRAM

A broad base of theory is provided, along with application through case studies as appropriate, to current practices of the profession. In-depth professional training is enhanced by a full offering of laboratory courses. Additionally, design experience is gained through the Seattle University Project Center. Teamwork and communication skills, ethical values, and critical inquiry are developed both in this project work and in studies in the humanities.

The Department of Mechanical Engineering provides our students the opportunity to learn modern engineering tools, which are important for future success upon graduation. In required and elective coursework and through team projects, students can learn and apply engineering analysis, computer modeling, thermal and control systems, automated data acquisition, and computer programming.

6.1 Degree Requirements

To graduate with a BS.MEGR degree, students must complete all required courses shown on their academic evaluation. Students may review their own Program Evaluation at any time by logging in to MySeattleU. Students must have GPAs of 2.5 or better based both on their science and engineering courses alone and on all courses taken at Seattle University.

In addition to the course requirements, all students must take the Washington State Fundamentals of Engineering (FE) examination (previously called the EIT) although it is not necessary to pass the examination to graduate.

The complete programs quarter by quarter study in mechanical engineering is regularly updated online. Because of the department's size, individual required courses are offered only one or twice a year and some elective courses may be offered only every other year. It is not advisable to take courses out of their recommended order even when prerequisites are not violated. Descriptions of all our courses, required and electives, can be found in the Undergraduate Catalog.

6.2 University Core Curriculum

The University Core Curriculum (48 credits) introduces students to the tradition of Jesuit education through humanities, social sciences, philosophy, theology, ethics and fine arts. Transfer students may have some of their University Core requirements modified or waived in accordance with the University Core Curriculum Policy.

Module I: Engaging Academic Inquiry (20 credits, 5 credits per class)

- UCOR 1100 Academic Writing Seminar
- UCOR 1300 Creative Expression and Interpretation
- UCOR 1400 Inquiry Seminar in the Humanities
- UCOR 1600 Inquiry Seminar in the Social Sciences

Module II: Engaging Jesuit Traditions (15 credits, 5 credits per class)
- UCOR 2100 Theological Explorations
- UCOR 2500 Philosophy of the Human Person
- UCOR 29xx Ethical Reasoning (UCOR 2900, 2910, or 2920)

Module III: Engaging the World (13 credits, 5 credits per class unless indicated)
- UCOR 3100 Religion in a Global Context
- UCOR 3400 Humanities and Global Challenges
- CEEGR 3020 Engineering Economy (3 credits)

Module IV: Reflection (departmental capstone courses)
- Senior design courses: ECEGR 4870, ECEGR 4880 and ECEGR 4890

6.3 Senior Engineering Design

All senior engineering, environmental science and computer science students participate in a sequence of courses which is a capstone design experience bringing together all aspects of their own departmental curricula as well as the interdisciplinary nature of solving "real world" problems. Through the Seattle University Project Center, student design teams work on industrially sponsored projects under the direction of a faculty member and a liaison engineer from the sponsoring company. This experience is one of the distinct features of engineering education at Seattle University and is an embodiment of the Jesuit concept of "education for the world".

The culmination of the senior design experience is Projects Day at the end of spring quarter. Projects Day consists of student teams making formal presentations of their year's work to an audience of project sponsors, faculty, and fellow students. In addition to the talks, students prepare demonstrations and have a poster session to further describe the projects.

Requirements for entering the senior design sequence are specified below.

6.4 Laboratory Program

The Department of Mechanical Engineering has a major commitment to the important "hands- on" experience provided by laboratory courses. There is an additional fee for laboratory courses.

Eleven engineering laboratory courses are provided for the students. These include:

MEGR 1050 (Engineering Graphics and Design)
MEGR 1060 (Machine Shop)
MEGR 1890 (Integrated Engineering Design Project 1)
MEGR 2810 (Engineering Methods)
MEGR 2890 (Integrated Engineering Design Project 2)
MEGR 3210 (Thermodynamics)
MEGR 3360 (Instrumentation and Data Acquisition 1)
MEGR 3370 (Instrumentation and Data Acquisition 2)
MEGR 3500 (Materials Science)

MEGR 3890 (Integrated Engineering Design Project 3)
MEGR 4350 (Dynamic Systems)

6.5 Senior Electives

The mechanical engineering program requires that all students take at least *two* mechanical engineering electives which total to a minimum of *six* credits. All courses counted toward fulfilling the mechanical engineering elective requirement must be 3000-level or above. The mechanical engineering department changes their elective offerings every year and strives to provide a range of both contemporary and relevant topics to supplement the major program requirements. Students should work closely with their faculty advisor to discuss upcoming offerings to learn when different electives will be offered.

6.6 Comprehensive Exam

All students take the department's mid-program comprehensive exam at the beginning of the senior year. The exam provides a direct measure of a student's knowledge of basic mechanical engineering subjects. The exam format parallels the Fundamentals of Engineering (FE) exam. The only reference material to be allowed in the exam is the latest edition of the NCEES Fundamentals of Engineering Supplied- Reference Handbook.

The comprehensive exam consists of questions like those on the FE exam. The exam is divided into nine sections covering all the major mechanical engineering topics which include Mathematics, Statics, Dynamics, Mechanics of Materials, Materials Science, Thermodynamics, Fluid Mechanics, Electric Circuits, Engineering Economy, Engineering Ethics and Computers. Students are given two chances to pass each section.

Since the comprehensive exam is like the FE exam, the exam helps prepare students for the FE exam taken during the senior year. Each section of the exam is graded on a Pass/Fail basis.
Student's final grade in MEGR 4870 and MEGR 4880 is based upon the results of the mid-program comprehensive exam.

6.7 Fundamentals of Engineering Exam

Taking the Fundamentals of Engineering (FE) Examination is required for graduation. Graduation from Seattle University, however, will not be affected by how well a student does on the examination. Students may choose to take the examination in a state other than Washington; students should contact the department chair if they plan to do this. The names of all students who sit for the exam are reported directly to the program by the test providers NCEES, and this list is sent to the Office of the Registrar to indicate fulfillment of this graduation requirement. Details of the exam, including how to register and the associated fees are found on the NCEES (National Council of Examiners for Engineering and Surveying) website.

The FE exam serves several purposes. For the department, the examination acts as an assessment of our graduates and by extension, or program. For the individual student, the FE Exam is a step beyond obtaining an engineering degree in establishing credentials as a professional engineer. When the FE Exam has been successfully passed and the individual has gained sufficient work experience, the Professional Engineering Examination may be taken. Although a professional license is not required for many mechanical engineering careers, it is essential for consulting or work for governmental agencies. Even if a student's chosen career does not require it, licensing is a mark of distinction that indicates a superior level of accomplishment in that chosen profession.

All students are strongly encouraged to wait until the spring of their senior year to take the FE Exam. Historical data indicates that students who take the exam in the spring have a significantly higher chance of passing. Since

passing the exam is not required for graduation and since there is no limit to the number of times it can be taken; there should be no hurry to take the exam before the spring of the senior year.

6.8 Curriculum Changes

The curriculum of the Department of Mechanical Engineering is under constant review by the faculty and Industry Advisory Board to enhance and improve our course offerings. From time to time, changes are made in the degree requirements. Students entering the program after such a change will be subject to the new degree requirements, which will be published in the Undergraduate Catalog. Students already enrolled will be allowed to complete the degree program under the requirements that existed when they entered, provided they are full-time students following the suggested sequence of courses and maintaining satisfactory progress. Part-time students or others who have not followed the suggested sequence of courses will have individual assessments of the courses needed for graduation. Such students will be provided an accredited program of study that may include courses from both the old and new curricula.

7. COMPUTER ACCESS AND ELECTRONIC MAIL

Students have access to required engineering software in two computer laboratories on campus, through the university maintained virtual desktop, and in some circumstances via direct download to personal student laptops. The Department of Mechanical Engineering makes extensive use of e-mail for communication among students and faculty. All e-mail will be sent to students' Seattle University e-mail account and students are advised to check their e-mail regularly.

8. REQUIREMENTS TO ENTER THE SENIOR DESIGN SEQUENCE

Students who wish to enter the senior design sequence, MEGR 4870, 4880, and 4890 must satisfy the following two criteria:

1) The student must have completed all the classes listed below:

   MATH 2340 (Differential Equations)
   MEGR 2810 (Engineering Methods)
   MEGR 3210 (Thermodynamics)
   MEGR 3240 (Heat Transfer)
   MEGR 3360 (Instrumentation and Data Acquisition 1)
   MEGR 3370 (Instrumentation and Data Acquisition 2)
   MEGR 3500 (Materials Science)
   MEGR 3710 (Machine Design I)
   MEGR 3890 (Integrated Engineering Design Project 3)
   CEEGR 3310 (Fluid Mechanics)

   Because many of our classes are taught only once a year, sometimes meeting this criterion might mean that a student must spend an extra year at Seattle University. The department realizes this and will allow a student to be deficient in at most two of the above courses. If a student is missing more than two required courses, admission is at the chair's discretion.

2) The student must have a minimum major GPA of 2.5

   Students who do not meet this criterion need to show that they could raise their major GPA to at least a 2.5 if they averaged a 2.7 GPA in all their remaining engineering courses. "F" grades must be included in this calculation even though the university Registrar will replace that grade once the course has been retaken.

It is important for students to realize that even if they have not completed all their junior course work, students have a responsibility toward their fellow senior project team members to have a basic knowledge of the material covered in junior courses they may not yet have completed.

9. ADMISSIONS

All students at Seattle University must have a major field of study into which they have been admitted. In the College of Science and Engineering students apply for entry into a particular department and are admitted according to their qualifications and the availability of openings. This section describes the various routes for admission into the Department of Mechanical Engineering.

9.1 First Year Applicants

For students with no previous college experience (including Running Start) applications are submitted directly to the university's Admissions Office. First year students entering the ME department must have completed four years of high school mathematics, including the equivalent of pre-calculus. Students entering the engineering programs are also expected to have taken at least two years of laboratory science including chemistry with physics highly recommended. Students not meeting the minimum requirements may be admitted to Pre-Engineering and request a change of major (with Program Add/Drop/Change e-form) once minimum requirements are met.

9.2 Off-Campus Transfers

Applicants who have had previous post-secondary educational experience and are not currently enrolled at Seattle University may directly enter the Department of Mechanical Engineering by submitting an application to the Admissions Office. Minimum qualifications for admission to the department are an overall grade point average (GPA) of 2.5 or better on a scale of 4.0 and a composite average of 2.5 in all of major specific courses. Engineering technology courses are not transferable to Seattle University. Grades in those courses will not be included in the major GPA calculation.

The decision to admit off-campus transfers directly into any program within the College of Science and Engineering is made by an Associate Dean. If an applicant is denied direct admission to the program, additional coursework may be recommended, or they may be admitted into Pre-Engineering. If they are admitted in Pre-Engineering, they can seek a transfer to mechanical engineering after successfully completing minimum requirements.

Seattle University recognizes the guidelines of the Intercollege Relations Commission (ICRC) for college-transfer associate degrees from Washington community and technical colleges, commonly called DTA, the direct transfer associate degree. Many ME students will choose the AS-T option which also has some transfer benefits. Transfer students should apply several terms prior to the desired entry quarter so that adequate planning time is available to ensure a smooth transition.

9.3 On-Campus Transfers

Seattle University students may apply to be admitted to the department at any time during the year. Students majoring in other SU programs may apply for a change of major into the department once some minimum coursework has been completed. Students who would like to change majors or add a minor can meet with a professional advisor from the Advising Center. Together, they will discuss potential majors or minors and

develop a plan for their intended coursework. See requirements to declare a major in CSE . Students complete the Program Add/Drop/Change e-form to change majors.

9.4 Second Degree Students

Students who have completed baccalaureate degrees in fields other than mechanical engineering occasionally apply for admission to the department. The admissions procedures and requirements are similar to prospective transfer students. University Core requirements are significantly altered for second degree students, but all other degree requirements must be met. Students staying on at Seattle University for a second degree should consult the Second Degree Policy for rules specific to this situation.

9.5 Non-Matriculated Students

Occasionally a working professional or a student not in the Department of Mechanical Engineering will want to take some MEGR courses without the intention of obtaining a degree. The department is willing to accommodate these individuals on a space-available basis. The student must have the proper background for the desired courses. Such arrangements are at the discretion of the Chair of the Department of Mechanical Engineering. Those not already enrolled at Seattle University must apply to the Admissions Office as a non-matriculated student.

If a non-matriculated student decides to apply for admission to the mechanical engineering program, a maximum of 15 credits taken at Seattle University in non-matriculated status may be applied toward the degree.

9.6 Leave of Absence and Returning After an Absence

It is recommended that any student stepping out for a period of time, complete a Student Leave of Absence e-Form (SLOA) request. While on SLOA institutional aid commitments, priority registration status, and academic catalog year may be maintained upon return to SU. Students who do not register for two consecutive quarters without SLOA will be administratively withdrawn.

Students who have withdrawn for any reason and wish to return, are required to apply for readmission (in accordance to the university policy). The application is subject to review by an Associate Dean. Students who withdraw from the university for one calendar year or more are subject to the degree requirements in effect at the time of their readmission. Readmission decisions are made by an Associate Dean of the College of Science and Engineering. Students who have been suspended should consult the conditions of suspension before requesting readmission. International students may be subject to some different rules for readmission due to U.S. immigration regulations. Students should consult with the International Student Center for details.

10. FINANCIAL AID

Financial aid is an important consideration for many of our students. Consult the Financial Aid page or contact them directly. Many of our students have financial aid packages including scholarships, loans, and work-study opportunities.

The College of Science and Engineering awards a limited number of additional scholarships. Information concerning qualifications and application procedures for Bannan Scholars, Sperry Goodman and other scholarships specifically aimed at Science and Engineering students can be obtained from the College of Science and Engineering website.

Lower division students within the College of Science and Engineering with low and middle income may also qualify for the Washington State Opportunity Scholarship.

11. ADVISING AND REGISTRATION

11.1 New Students-First Term Advising and Registration

When students are first admitted to the department one of the department's faculty members will be selected to act as academic advisor. Advisors assist students prior to registration each quarter and can discuss academic and career paths. Students may also talk with advisors about any problems have that affect a student's ability to be successful at the university. A student may request to change their advisor at any time and without any explanation with the department's administrative assistant using e-mail and. Students may then be assigned to another faculty advisor for the remainder of their time in the department**.**

11.1.1 First Year Students

First year students admitted for fall quarter register for classes during the summer. Students will be contacted with information about when and how to get advice and register. The university also has a division of Student Academic Services with several offices that can assist transition from high school to college. These include the Bellarmine Advising Center, Disabilities Services and Learning Assistance Programs. The Department of Mechanical Engineering is also happy to assist students in their transition. Students entering other quarters will work with the Science and Engineering Advising Center to get registered.

11.1.2 New Transfer Students

The College of Science and Engineering Advising Center is an important resource for new transfer students; they will likely the first contact to begin the registration process. One of the professional advisors specializes in engineering transfer issues and is very knowledgeable about our engineering programs and curricula, working closely with the department chairs.

11.2 Continuing Students

Continuing students normally register for classes during Advance Registration (usually about the seventh week of every quarter) It is our department policy that all students must make an appointment to see their advisors during the advising period. Students will not be eligible to register until they have consulted with an advisor. Faculty will contact students with information regarding how to make an advising appointment.

11.3 Registration

An on-line registration process is used. MySeattleU has the tools required for academic planning and registration. Registration and schedule changes for classes can be done any time between pre-registration and the end of the add/drop period at the start of the term. Withdrawals can be done according to the university regulations prior to the last day to withdraw. Important dates, such as the last day to add/drop classes and to withdraw from classes, can be found in the Academic Calendar. The Final Exam schedule is also found there.

When students register, they may find some classes are already closed. Some College of Science and Engineering departments use the WISE form to assist in managing course enrollments. As the form becomes available each quarter, it will be posted by the Advising Center along with information regarding whom to contact for other College of Science and Engineering classes. For UCOR classes, see the recommendations on the Advising Center webpage.

In the Department of Mechanical Engineering, it is our policy to set section sizes at their projected enrollments. This sometimes means that classes are closed when several students still need to enroll. If they have the necessary prerequisites, they will be permitted to take required classes, but we cannot guarantee enrollment in a specific laboratory section, if another section is not yet closed.

11.4 Advising For Continuing Students

A list of all mechanical engineering students and their advisors is maintained by the departmental senior administrative assistant. Students can find their assigned advisor by logging in at mySeattleU. Students who are unhappy with their advisor assignment can tell the senior administrative assistant and a change will be made.

A primary goal of the mechanical engineering program is to ensure that all students progress through the academic program in its intended course sequence while meeting all grade requirements. The department academic advising system is the principal mechanism through which this goal is achieved. Listed below are typical areas covered in a student advising session.

- Advising on study habits as appropriate
- Curriculum structure and prerequisite flows throughout the curriculum
- Continued advising on course prerequisites
- Study abroad, as appropriate
- Extracurricular activities
- Professional/career advising, such as interest in graduate school, applying to internships and reviewing resumes or cover letters

Additional advising support can be found the Science and Engineering Advising Center. Professional advisors can assist with various student issues including policies, referrals to resources, educational planning as well as struggles students may encounter.

12. TRANSFER CREDITS

Students who have attended post-secondary schools other than Seattle University, should send complete transcripts to Seattle University. It is the student's responsibility to have complete, official transcripts sent to the Admissions Office (if they are a new transfer student) or the evaluations unit of the Registrar's Office (if they are continuing SU students). If they are enrolled in another school at the time they apply for admission to Seattle University, they must be sure to have updated, complete transcripts sent when they complete their last term's work in order to have their courses transferred. Specialists will evaluate the transcript(s) and indicate which course requirements for their Seattle University degree have been satisfied.

Upon admission, and whenever they submit transcripts from other schools, students should review their Program Evaluation (refer to guide to reading program evaluation) available through mySeattleU to make certain that all transfer credit has been correctly applied. If there are discrepancies, students need to discuss them with the transfer evaluator in the Registrar's Office to whom they have been assigned and with their departmental advisor. When students are admitted to Seattle University, they should begin working with the department chair and their advisor to make sure that they understand exactly how much of their previous work has been credited and what degree requirements remain to be completed.

Transfer guidance for the College of Science and Engineering is found on the Advising Center website.

Do not assume that transfer credit will be counted until it has officially been granted.

12.1 Transferrable Credits

Specific rules governing the transfer of credit to Seattle University from other institutions are summarized below.

- *Credit and content/applicable to degree*-student receives an equivalent number of credits for a course completed at another institution and it satisfies either UCOR or major requirement.
- *Credit and content/elective*-student receives an equivalent number of credits for a completed course, but it does not satisfy a requirement.
- *Content only/applicable to degree*-students who have exceeded the maximum number of transferrable credits at another institution can have the content for a requirement satisfied but receive no additional credits toward the required 180 min credits to graduate.
    - 90 lower division credits can be transferred
    - 45 upper division credits can be transferred

No course work from technology programs can be transferred. No work-related experience can be counted toward degree requirements. A later section in this handbook describes rules governing credit by examination. A transferred course with fewer credits than the equivalent course at Seattle University, may create a shortfall in credits to graduate requiring additional credits to be completed at SU. (Two semester hours are equivalent to three quarter hours.)

Core requirements for transfers are found in the University Core Policy. Questions can be directed to an Academic Advisor.

Note: To be considered equivalent, the transfer course must be within one credit of the corresponding course at Seattle University.

The following courses are of particular interest in transfer to the MEGR department

Mathematics: three quarters (15 credits) of basic calculus (MATH 1334, 1335, 1336), 3 credits of multivariable (advanced) calculus (MATH 2330), 3 credits of linear algebra (MATH 2320), and 4 credits of differential equations (MATH 2340).

Physics: three quarters (15 credits) of calculus-based physics courses and laboratories (PHYS 1210/11, 1220/21, 1230/31

Chemistry: The required engineering-oriented chemistry course (CHEM 1500) contains a laboratory component (CHEM 1501). Students transferring chemistry without laboratories will be required to take the one-credit laboratory CHEM 1501.

Mechanics: Statics (MEGR 2100), Dynamics (MEGR 2300) and Mechanics of Materials (CEEGR 2210) provide the foundation for many mechanical engineering upper division courses. Most courses taught as part of the engineering transfer tracks of the Washington State Community and Technical College system meet the transfer requirements for these courses.

Material Science: This course is taught in the 3rd year at Seattle University. Some colleges offer transferable courses.

Programming: No transferable courses are currently taught in the community college system for the department's programming and numerical analysis course (MEGR 2810). The department does encourage transfer students to take a programming course prior to attending Seattle University, but it will typically not satisfy the department's programming and numerical analysis requirements.

12.2 Dual Enrollment

Students at Seattle University taking courses at other schools should not expect them to count toward their SU degree without having previously cleared it with the Evaluations Unit of the Registrar's Office. Students are required to submit a Dual Enrollment e Form **before** taking coursework at another institution simultaneously.

Start by discussing the situation with an academic advisor or the department chair. The Registrar has a Transfer Verification e-Form that will help to avoid any misunderstandings. It should be filled out well in advance of the quarter for which the simultaneous enrollment is planned.

Except during summer quarter, permission for dual enrollment is normally granted only to relieve scheduling conflicts which would impede progress toward and delay graduation. Final approval is determined by the Assistant Dean of the College of Science and Engineering.

12.3 Minimum SU Credits Required

A minimum of 45 quarter credits must be completed at Seattle University to meet the Residency Requirement for the bachelor's degree. In some circumstances recognition of content can be granted for courses taken at other institutions after the junior year, but no additional credits will be granted. There are exceptions to this rule, but in no case will more than 135 total credits be allowed in transfer from all institutions. See the university Transfer Policy under section II. Undergraduate for these exceptions.

13. MINORS AND DOUBLE MAJORS

Some students majoring in mechanical engineering are interested in obtaining minor degrees or even a second major. The Seattle University's policy regarding undergraduate minors can be found on the Registrar's website. Specific requirements for each discipline are described in the *Undergraduate Catalog*,

Mechanical engineering students earn thirty credits of mathematics. This typically qualifies them for minors in mathematics (subject to certain restrictions as outlined in the *Catalog)* but the minor must be applied for. To obtain a minor in a particular discipline, students complete the e-form Program Add/Drop/Change, and talk to the chair of that department.

The requirements to double majors or earn second baccalaureate degrees at Seattle University are detailed on the Registrar's website. Consultation with a faculty advisor is helpful in planning the combination of programs within the constraints of the mechanical engineering sequencing.

14. APPLYING FOR GRADUATION

Application for graduation is done via mySeattleU. The process and due dates are listed by the Office of the Registrar. The Registrar's Office will determine the remaining course requirements and place an assessment online to be verified by the department chair or an academic advisor. Students are notified of the remaining graduation requirements.

It is advantageous to apply well in advance of the intended graduation date. The information from the Registrar's Office represents an agreement between the student and the university as to exactly what remains to be done. Once this process has been completed there can be no misunderstanding about remaining requirements. It also allows time to thoroughly plan those remaining requirements.

Students who will have 18 or fewer credits remaining to complete their degree requirements at the end of spring quarter may participate in the university's commencement exercises in June in accordance with the university's policy on Commencement with Deficiencies. Rare exceptions are made to this policy for students with more than 18 remaining credits through the Attend Commencement with Deficiencies e-form.

15. MATHEMATICS PLACEMENT

It is important that new first year and transfer students be placed in mathematics courses appropriate to their mathematics background and level of accomplishment. The BS.MEGR curriculum assumes that new first year students have had sufficient mathematical preparation for immediate entry into first quarter calculus. Students who do not place into calculus will require additional MATH courses; the time required to degree completion could be extended as much as a year.

Math placement and exam information can be found on the Mathematics Department website.

15.1 First-year Students

- **No college level coursework**: required to take the Math Department's algebra placement exam, even if they have SAT, ACT or AP scores.
- **With college-level coursework** that may count toward SU math requirements: work with an academic advisor regarding placement.

15.2 Transfer Students

Transfer students are placed based on completed coursework, or the SU math placement exam if there are no math credits to evaluate.

16. CREDIT BY EXAMINATION

Students who think they have mastered a subject through personal study or work experience may receive credit for the course(s) by examination. The rules for credit by examination are outlined in the Seattle University policy Credit by Examination. As in many other situations, it is required that a form (Petition for Credit by Examination) be submitted. Students cannot take exams for a course in which they are currently registered or have taken in a previous quarter.

17. GRADING OPTIONS

All courses to be counted toward the BS.MEGR degree must be taken for a letter grade with a quality point value. They may not be taken on a credit/fail (CR/F) or pass/fail (P/F) basis. However, due to the COVID outbreak, exceptions were made allowing students during the height of the pandemic to take many courses credit/fail.

Officially withdrawing from a course is an action initiated by the student. This will result in a grade of 'W' which will not affect the GPA. If the course is required for graduation students will have to enroll in it again and complete it. Students withdraw using mySeattleU. See the policy for limited exceptions.

A student can request a Hardship Withdrawal (HW) to withdraw from one or several courses. Hardship withdrawals may be granted for the death of a family member, catastrophic illness in the family, or an illness/incapacitating injury to the student. The Hardship Withdrawal Request form is required along with documentation. It is recommended that students speak with the Assistant Dean for guidance.

Students who, for reasons beyond their control, are unable to complete their coursework during the quarter may, with the approval of the instructor, receive a grade of Incomplete (I). The Incomplete (I) grade is a temporary grade indicating that work in the course was acceptable, although a required portion of it was not completed because of illness or other serious circumstances beyond the student's control. The work must be completed during the following quarter (except summer) to have the Incomplete changed over to a letter grade. Otherwise, the grade will convert to the default grade that the faculty noted. Students should talk to individual course instructors if they feel they are in this situation.

18. REPEATING COURSES

The university's policy on repeated courses explains the limitations under which a course can be repeated. A course in which a student received a grade of C or lower may be repeated. Grades from all attempts will appear on the SU transcript, but only the most recent grade will be used in computing the GPA. Students should be aware of minimum prerequisite grades for advancement in some sequences. Failed courses (grade F) must be repeated if they are to count toward graduation requirements.

Once a course has been taken and a grade received at Seattle University, it may not be taken at another institution for purposes of transferring the **credit**. A student who receives permission to repeat a course at another institution will have no adjustment made to the Seattle University cumulative grade point average. The new course may count for **content only** which may in turn improve the major GPA.

A course may be taken at Seattle University only three times including withdrawals. Registrations resulting in grades of CR, I, N, P, W, HW, LW, Y or Z are included in the three maximum attempts allowable. A student who has not satisfactorily completed a departmental requirement after three attempts will not be able continue in that major.

19. ACADEMIC INTEGRITY

Seattle University is committed to the principles of academic honesty and integrity. Thus, the university has developed a policy that defines the standards of conduct, procedures, and penalties imposed by the faculty member (or dean or provost) on a student found to have violated the academic integrity policy. The Department of Mechanical Engineering strictly adheres to the university academic honesty policy and has high expectations of our students to be honest and ethical in their conduct. Acts of academic dishonesty include, but are not limited to, committing plagiarism, cheating on exams and other assignments, submitting false data, submitting work for multiple purposes, and falsifying academic documentation.

20. SATISFACTORY PROGRESS: ACADEMIC WARNING, PROBATION AND SUSPENSION

Engineering students are required to maintain satisfactory progress. This means that both overall and science/mathematics/engineering GPAs are 2.5 or better. Students who fail to maintain satisfactory progress may lose priority for entrance into engineering courses. Scholastic difficulties can lead to warning, probation and ultimately suspension from the department, college, and university.

Students with GPAs below 2.5 are subject academic warning, academic probation or suspension and will receive ample notification from the Assistant Dean so that they might have the opportunity to correct the problem.

21. LEARNING ASSISTANCE PROGRAM

The Learning Assistance Program (LAP) at Seattle University provides additional support to students who wish to strengthen their learning skills. The LAP offers the following services: tutoring, study skill development, personalized academic assistance, learning assessments, and handouts and reference material support. By using these services, students can improve their skills in note taking, time management, study strategies, and test-taking. The LAP is available to all Seattle University students and is located on the second floor of the Lemieux Library.

22. STUDENT PERCEPTION OF TEACHING

As an aid in improving the quality of the teaching in its courses, the department asks students to fill out an online evaluation at the end of the quarter for most of the courses they take. This information helps us in two ways. First, it acts as feedback to instructors so that they can identify and respond to areas that students feel need of attention. Secondly, the information is used as one of several measures of the work performance of the faculty. Teaching is only one of several dimensions to a faculty member's job, but at Seattle University it is the most important. Student feedback is one method that the university has for evaluating the effectiveness of its faculty with regard to teaching: the university places great importance on this input.

The university is quite serious about the evaluation process; we ask students to be equally sincere. Feel free to state any negative impressions. It is through these that improvements can be made. Feel free also to express positive observations. Like students, we are pleased to know when our efforts are well received. We do ask students to avoid personal or humorous remarks because these can be easily misinterpreted when read by anyone other than the instructor.

23. ENGINEERING STUDENT ORGANIZATIONS

The Mechanical Engineering Department encourages all students to join the American Society of Mechanical Engineers (ASME). This organization sponsors conferences and publications, as well as many professional subgroups that cover the broad range of mechanical engineering. It also sponsors student chapters at colleges and universities as a way of developing professional awareness among those planning to make mechanical engineering their career. For a modest annual fee, students can become a student member of ASME, they will receive access to several ASME publications, and they will also be eligible to attend chapter-sponsored activities of both a social and professional nature.

Other professional organizations in which our students participate include the Society of Women Engineers (SWE) and Tau Beta Pi (TBP). Tau Beta Pi, the national engineering honor society, was established to recognize engineering students with outstanding academic records. Membership is by invitation. Students who are eligible will be contacted by student officers of the society. The Society of Women Engineers (SWE) is open to all engineering and science students.

Seattle University's Engineers for a Sustainable World (ESW) student chapter strives to implement environmentally and economically sustainable engineering projects, while involving and training responsible engineering students and professionals.

Many departments in the College of Science and Engineering have similar organizations and CSE focused clubs.

Education extends beyond the walls of the classroom and the topics of textbooks. Participation in student organizations provides opportunities to develop social and leadership skills. We encourage mechanical engineering students to be active participants. For more information about SU clubs consult their website.

24. PART-TIME EMPLOYMENT

With the high costs associated with going to school, many students find it necessary to work part time. This can be a valuable experience, particularly if employment is found in a technical area. Many companies in the Puget Sound region have employment opportunities available for students while they are attending school. Positions such as these are often the first step toward securing permanent employment upon graduation.

Although part-time employment while attending school has some obvious benefits, it can also detract from a student's education. Engineering is a demanding course of study that requires a considerable degree of attention. A traditional rule of thumb in engineering education is that students should spend at least two hours studying for each hour spent in class. Most students can handle ten hours of work per week without it affecting their performance in school. Strong students might work up to twenty hours per week and still perform well in their studies, but beyond that, however, compromises must be made. **If personal financial situation requires significant number of hours of work per week or if there is a particularly attractive job opportunity, we urge students to attend school on a part-time basis in order to maintain an adequate level of academic performance**. Time as an undergraduate provides students with a nearly unique opportunity to study and master topics comprehensively and from basic principles. If a student's ability to focus on education is jeopardized through too many hours devoted to work, it will be very difficult to make up for in later years.

The department and individual faculty sometimes become aware of job openings for engineering students. These are usually announced through e-mail. The Career Engagement Office is also a good source of information about part time employment.

The department and university offer some part-time student employment opportunities. Students grade papers for classes, assist in the laboratories, and work in computer laboratories. Inquire with faculty and in departmental offices to learn about these opportunities.

25. CAREER ENGAGEMENT OFFICE

The ultimate goal of most mechanical engineering students is to work as a practicing engineer. Seeking a first job is a process that should begin up to a year prior to graduation. To aid in this process, the university has a Career Engagement Office. Professionals there can help develop an effective resume and give tips on how best to interview. This office is the focal point on campus for recruiters from companies.

The department tries to help in this process also. Students should talk to faculty members who are most familiar with their background. Sometimes faculty might have contacts in local industry or know of companies that are hiring. Job notices will be sent out to mechanical engineering students via email when prospective employers contact the department looking for applicants. In times when jobs are scarce, a great deal of time and effort may be needed in order to secure a position. Even when jobs are more plentiful, plan sufficient time to find the best possible situation.

26. GRADUATE SCHOOL

Undergraduate programs in engineering provide a broad-based general education to those wishing to enter the engineering profession. Elective courses allow for a certain amount of specialization, but for the most part

depth is sacrificed in favor of breadth. It is expected that practicing engineers will be life-long self-learners to keep abreast of new developments and to gain the level of expertise required of particular job assignments. Graduate school provides a formal way of obtaining expert status in subfields of mechanical engineering. Some students enter graduate school directly upon finishing their undergraduate studies. Others may wait until they have gained a few years' experience in the workplace.

Students who may be interested in continuing studies at the graduate level, should talk to faculty members. All have attended graduate school themselves and can talk about what to expect and help with strategies for selecting and applying to graduate schools that would be a best fit.

27. ASME CODE OF ETHICS

Engineering is not merely a job; it is a profession. This implies that engineers have a responsibility to society and should strive to increase the competence and prestige of the engineering profession. This sense of ethical behavior should be a part of a student's conduct. Please consult the National Society of Professional Engineers (NSPE) Code of Ethics.