

# **Materials Science and Engineering Ph.D. Program**



## **Graduate Student Handbook 2020-2021**

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## WELCOME

Welcome to the Washington State University, Materials Science and Engineering Graduate Program (MSEP). Since its establishment in 1988, it has evolved into a vibrant interdisciplinary program with the participation of faculty from numerous departments and schools across multiple colleges. This handbook is intended to orient you as you join us in Pullman and guide you through your degree program. As always you are welcome to contact either Kjelda Berg or me if you have additional questions or concerns.

Sincerely,



Scott Beckman

## COVID-19

As you are all aware the recent COVID-19 pandemic has resulted in many changes to universities worldwide, including Washington State University. Within our graduate program, these changes are reflected in the manner we teach classes and perform research. **As of August 11, 2020** we have committed to teaching all of our classes online, allowing you to attend remotely. The details of each course will be managed by the designated instructor. We will still hold our graduate research credits in a face-to-face manner. Each of you are responsible for following the safety guidelines provided by the university, your college, and affiliated department.

Because there is still much unknown about the epidemiology of the pandemic, you should be prepared for possible changes in laboratory protocols during the course of this year. Washington State University maintains a website for announcements at: <https://wsu.edu/covid-19/>

## PROGRAM DIRECTORY

### Mailing Address

Graduate Program in Materials Science and Engineering  
Washington State University  
P.O. Box 641030  
Pullman, WA 99164-1030  
Campus Zip: 1030  
(509) 335-8231  
<https://materials.wsu.edu/>

### Administration

John McCloy MSEP Director Dana 239D 509-335-7796 <a href="mailto:john.mccloy@wsu.edu">john.mccloy@wsu.edu</a>	Scott Beckman MSEP Acting Director ETRL 252 509-335-8571 <a href="mailto:scott.beckman@wsu.edu">scott.beckman@wsu.edu</a>
Kjelda Berg MSEP Program Coordinator Dana 239A (AM) French Administration 324 (PM) 509-335-8231 <a href="mailto:bergk@wsu.edu">bergk@wsu.edu</a>	

### Affiliated Faculty

A listing of our faculty contact information can be found on our website.

## **Financial Personnel and Coordinators in Affiliated Departments**

### **Chemistry (CHEM)**

Jennica Stiff Fiscal Technician Fulmer 305/335-9463 <a href="mailto:jennica.stiff@wsu.edu">jennica.stiff@wsu.edu</a>	Vacant Graduate Academic Coordinator
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### **Civil and Environmental Engineering (CEE)**

Kelly Nigro Administrative Manager Sloan 102/335-9578 <a href="mailto:kelly.nigro@wsu.edu">kelly.nigro@wsu.edu</a>	Tammy Bowen Graduate Academic Coordinator Sloan 108/335-4547 <a href="mailto:tammyb@wsu.edu">tammyb@wsu.edu</a>
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### **Chemical and Bioengineering (CHE BE)**

Jo Ann McCabe Finance/Budget Manager Wegner Hall 105G/335-4731 <a href="mailto:mccabe@wsu.edu">mccabe@wsu.edu</a>	Samantha Bailey Graduate Academic Coordinator Wegner Hall 105H/335-4001 <a href="mailto:samantha.bailey@wsu.edu">samantha.bailey@wsu.edu</a>
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### **Institute for Shock Physics (ISP)**

Sheila Heyns Administration and Operations Shock Physics 202C/335-1861 <a href="mailto:shyens@wsu.edu">shyens@wsu.edu</a>
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### **Mechanical and Materials Engineering (MME)**

Alyson Kincaid Administrative Manager Sloan 201/335-8655 <a href="mailto:aly.kincaid@wsu.edu">aly.kincaid@wsu.edu</a>	Amanda Wagar Graduate Academic Coordinator Sloan 203W/335-4546 <a href="mailto:amanda.wagar@wsu.edu">amanda.wagar@wsu.edu</a>
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### **Physics (PHYS)**

Robin Stratton Administrative Manager Webster 1245/335-9532 <a href="mailto:rstratton@wsu.edu">rstratton@wsu.edu</a>
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## 2020-2021 ACADEMIC CALENDAR

### **Fall Session 2020**

First day of instruction for the term	Monday, August 24, 2020
Labor Day- All University Holiday	Monday, September 7, 2020
Veteran's Day- All University Holiday	Wednesday, November 11, 2020
Deadline to take final oral examination for advanced degree	Friday, November 20, 2020
Thanksgiving vacation begins	Monday, November 23, 2020
Thanksgiving vacation ends	Friday, November 27, 2020
Deadline to submit final thesis/dissertation to graduate school (5 business days after successful defense)	Tuesday, December 1, 2020
Final examinations begin	Monday, December 14, 2020

### **Spring Session 2020**

First day of instruction for the term.	Monday, January 11, 2021
MLK Jr Day- All University Holiday	Monday, January 18, 2021
President's Day- Class Holiday	Monday, February 15, 2021
Spring Vacation	March 15-19, 2021
Recommended Deadline to take Final Exams	Friday, April 9, 2021
Last day of instruction for the term	Friday, April 30, 2021
Final examinations begin	Monday, May 3, 2021

For more detailed calendars please visit: <https://registrar.wsu.edu/academic-calendar/>

## ORIENTATION & TO-DO LIST

Students are expected to arrive in Pullman at least 10 days before classes begin in August so that they can attend orientations and have enough time to settle in before the semester starts. The following is a list of important items to do once you arrive on campus:

- Attend orientations, including:
  - The Graduate School orientation is organized into five modules.

We highly recommend you work through the first four modules before arriving on your home campus; you can work through the fifth module the week before classes start. This orientation material will remain available to you during your first semester at WSU, so you can refer to it as needed. Topics include an introduction to life as a WSU Cougar, tips for new graduate students, health insurance and services resources, details of assistantships and associated tuition waivers, and fun things to do on the WSU campuses and surrounding communities.

You can access course information via Blackboard Learn at <https://learn.wsu.edu>. If this course leaves some of your questions unanswered, please provide feedback for us through the review questions at the end of each module. In addition, feel free to contact the Graduate School for assistance at [gradschool@wsu.edu](mailto:gradschool@wsu.edu) or call 509-335-6424.

- The Materials Science and Engineering Program orientation via Zoom. August 21, 2020.
- The orientation for the department where you TA, if applicable. Contact the graduate academic coordinator, listed in previous sections, for more information:
- Fill out personnel paperwork-contact Kjelda Berg at [bergk@wsu.edu](mailto:bergk@wsu.edu) to schedule an appointment.
  - US Students: bring your driver's license and original social security card to the MSEP Academic Coordinator office (Dana 239A) and fill out the I-9, W4 forms and a Personnel Action Form, which are necessary for receiving your tuition waiver, stipend, insurance, etc.
  - International Students: bring your passport, I-94, I-20, and social security card to the MSEP Academic Coordinator office (Dana 239A) to fill out the necessary forms. If you do not have a social security card, you will be able to apply for one during the OISS orientation.
- Obtain a Network ID (NID) and WSU email account
  - You can get your Network ID online at [www.wsu.edu/nid](http://www.wsu.edu/nid) or at the Information Technology Help Desk (first floor of the IT building) as soon as you have a WSU ID number. Your NID is needed to register, check grades, check billing, etc. If you are an international student you may also need the "one-time access code" found on the admission certificate that you received from the Graduate School.
- WSU email account
  - Washington State University has partnered with Microsoft to provide Office 365 e-mail accounts for students. When you are admitted to WSU, your Office 365 e-mail account and your official WSU e-mail address is automatically set up. Please let the academic coordinator ([bergk@wsu.edu](mailto:bergk@wsu.edu)) know what your WSU email address is so she can keep you updated on program events and deadlines.

- Obtain a WSU ID card
  - WSU ID cards, also called “Cougar Cards,” can be obtained at the Cougar Card Center, which is located in room 60 of the Compton Union Building (CUB). You should bring your WSU ID number and at least one piece of photo ID.
- Register for Classes
  - All registration is done online at <http://my.wsu.edu/>. You will need a Network ID to register. If you are still missing any important pieces of paperwork at that time, *e.g.*, transcripts, GRE or TOEFL scores, documentation of measles immunization, you may be unable to register until they are received by the Graduate School.
- Obtain a Parking Permit, if needed
  - Bring your WSU ID number to the Parking and Transportation Building on the corner of Colorado St. and D St. (<https://transportation.wsu.edu/>)
- Obtain Office Assignments and Keys
  - Please see the advising department (MME, PHYSICS, CHEM, CEE, ISP, CHEBE BRC, CMR, CMEC) academic coordinator or your advisor to obtain keys for the labs you will be working in.
- Update Contact Information
  - Once you have established a local mailing address and phone number, please update your contact information online at <http://my.wsu.edu/>. This will update your address with the Graduate School, payroll, benefits services, *etc.* It is very important to update your information by the first week of class since your first paycheck goes to your local address.

## RESPONSIBLE CONDUCT OF RESEARCH TRAINING

Effective **January 1, 2020**, the Vice President for Research, Dr. Chris Keane, announced a [policy](#) that expanded the Responsible Conduct in Research (RCR) requirements. This new policy requires that all graduate students must take the Collaborative Institutional Training Initiative (CITI) RCR program, in place of the previous requirement for the RCR training package from WSU on the [myresearch.wsu.edu](http://myresearch.wsu.edu) site. Graduate students who were current for the previous training were grandfathered for the Spring 2020 semester. However, for Fall 2020, all graduate students must complete the new CITI-RCR training. The immediate impact of a failure to complete the training will be a delay in the processing of the student’s assistantship paperwork until the training has been completed. In the future, enrollment holds will be placed on the student’s account if the training is not completed, even if the student is not currently on an assistantship.

Please complete the new CITI-RCR training as soon as possible. The training may be accessed through the <https://myresearch.wsu.edu/> portal, under the Training tab. Every new MSEP student should complete the training by August 20, 2020.

After you complete the training you will receive a confirmation email. Please add your name and forward the email to the academic coordinator Kjelda Berg at [bergk@wsu.edu](mailto:bergk@wsu.edu). It will become a permanent part of your personnel file and will be effective for five years, after which you will need to re-take the training.



## **SPECIAL INSTRUCTIONS FOR INTERNATIONAL STUDENTS**

The Office of International Programs (<https://ip.wsu.edu/>) offers an orientation for new international students on August 12. Graduate students must check in between 11:30 and 12:00 at the Spark Building. The orientation will last until 5:00, with an optional dinner after.

Attendance at this orientation is mandatory for all international students, even those transferring from other U.S. schools.

There are many forms and helpful information available on the OIP website, including a pre-arrival information request form, information on obtaining a visa, a welcome packet, and the orientation registration form. The office can also put you in contact in advance with other students from your home country that may be able to help you find housing. We highly recommend contacting them soon after you are accepted.

## **MATERIALS SCIENCE AND ENGINEERING PHD PROGRAM (MSEP) OBJECTIVES AND LEARNING OUTCOMES**

### **Program Objectives**

The Washington State University Materials Science and Engineering Program PhD holds the following objectives as its primary aims.

1. To train students to become effective researchers in the subject of materials science and engineering, to contribute to our understanding of materials science and address technical challenges in materials engineering.
2. To prepare students for careers as scientists and engineers in industry, government, and academia.

### **Learning Outcomes**

The following student learning outcomes have been identified as necessary for the successful achievement of the program objectives. Students successfully graduating from the MSEP will:

- (a) demonstrate expertise and understanding of the core physical science and engineering fields;
- (b) identify problems in the field of MSE, design sound experimental or theoretical methods to address these problems, and perform the corresponding research to solve these problems;
- (c) clearly and effectively communicate, both written and orally, their scientific activities to their peers and to the general public;
- (d) engage effectively with the scientific community through professional participation in conferences, meetings, and workshops;
- (e) understand careers in MSE, including employment opportunities in industry, government, and academia; and
- (f) understand the importance of safe laboratory practices as well as the ethical and social responsibilities of scientists.

## **GUIDELINES FOR GRADUATE STUDENTS IN THE MATERIALS SCIENCE AND ENGINEERING PROGRAM**

Materials Science and Engineering (MSE) is an interdisciplinary program based upon the principles and practice of designing, synthesizing, and characterizing useful materials. The program accepts qualified individuals with the completion of a bachelor's or master's degree with the tenacity to pursue a doctoral degree. At WSU, the Materials Science and Engineering Program (MSEP) is a joint academic inter-college program between the College of Arts and Sciences and the Voiland College of Engineering & Architecture, and is administered by the Graduate School.

### **Introduction**

The guidelines enumerated in this document describes the policies and procedures used by the MSEP regarding graduate student admissions, appointments, programs, and include other general information for student guidance.

Except for emphasis, the information contained in the WSU *Graduate School Policies and Procedures* bulletin are not repeated herein. Those policies are university-wide policies upon which this document expands. The graduate programs of all students in MSEP must meet all requirements delineated in this document, as well as all requirements of the Graduate School. Students are expected to read and understand the *Graduate Bulletin* and the *Graduate School Policies and Procedures*. These policies can be found at <https://gradschool.wsu.edu/policies-procedures/>. Questions should be discussed with the Director of MSEP.

Graduate work, including both classroom and research endeavors, is a cooperative venture between faculty and students. Faculty members guide and assist students in gaining knowledge, experience, and ability. However, the quality of education, research and creative output of a graduate student is primarily dependent on the student's individual efforts. Students are therefore encouraged to aggressively pursue self-study in their areas of interest, use their initiative, imagination and creativity as they pursue their research, and develop a spirit of community and volunteerism by participating actively in MSE-related professional societies.

### **Admission**

The Academic Coordinator corresponds with interested applicants and collects applications, transcripts, and letters of recommendation. When the file is complete and a Departmental Recommendation Memo has been received from the Graduate School, the file is given to the Graduate Admissions Committee for a decision on admittance and potential recommendation for financial assistance.

Admission to the MSEP requires a minimum grade point average of 3.0 (on a 4.0 scale). A Master of Science degree is not a prerequisite for application to the program. Admission of applicants from foreign universities will be based on consideration of the School's grading system, evaluation of the Graduate Admission forms, and letters of recommendation.

### **Undergraduate Deficiencies**

Because of the interdisciplinary nature of materials science and engineering, students entering the MSEP may have a wide range of backgrounds. Students with BS or MS degrees in Chemistry, Physics, or Materials Science and Engineering, or Mechanical Engineering will normally meet the course prerequisites. Students with degrees in other fields of engineering and the physical sciences should discuss with the Program Director what, if any, undergraduate prerequisites will be required.

### **Appointments**

In order to be considered for an appointment (Research Assistant or Teaching Assistant) for the fall semester, all application materials must be received by

- March 1 (Applicants from PRC)
- April 1 (Applicants from outside US)
- May 1 (Applicants within US and Canada).

For spring semester, all application materials must be received by

- July 1 (Applicants from PRC)
- August 1 (Applicants from outside US)
- September 1 (Applicants within US and Canada).

The following will be considered in selecting those for appointment: GPA, area(s) of interest, research experience, letters of recommendation, TOEFL scores, and quality of previous graduate work. Decisions on support of students from specific funded research projects are the responsibility of the faculty member who is the Principal Investigator of the project. Appointments are made for one or two semesters during the academic year. If the coursework, research progress, and assigned responsibilities have been performed satisfactorily, students may normally expect reappointment during the following academic year until their degree program is completed. There is no guarantee of summer financial support. Students should discuss any concern about financial support with their faculty advisor or the Program Director.

### **Selecting a Research Topic and Advisor**

All students must have a Faculty Advisor who will also serve as the Dissertation Supervisor. The student and advisor shall select a minimum of two additional Graduate Faculty within their first or 2<sup>nd</sup> semester in the MSEP to serve as the student's Dissertation Committee. One member of the dissertation committee should be from a department/school different from that of the dissertation supervisor, and preferably from a different College.

The program of study shall be approved by the dissertation committee and the Program Director. The program of study should then be submitted to the Graduate School prior to the start of the second semester of the student's enrollment.

### **Annual Meeting and Evaluation**

It is strongly recommended that all students in the Materials Science and Engineering Program meet with their committee at least once per year. The purpose of this meeting is for the student to show progress and for the committee to give feedback to the student. It is **required** of every student to meet annually with the primary advisor to complete an annual assessment of progress towards the degree. The student self-assessment portion and the advisor portion is compiled and forwarded

to the MSEP Director and Program Coordinator. An evaluation will then be made by the MSEP graduate studies committee, and a letter of progress placed in the students' file.

### **Preliminary Examination**

The intent of this examination is to assess the research ability and knowledge base of the student and whether they demonstrate the capabilities of completing the research requirements of a doctoral program. The preliminary examination should be scheduled by the *first semester of the third year* of the student's program. Any deviation from this policy must be pre-approved by a petition to the MSEP Director.

The examination shall consist of a written component and an oral component. The written portion shall be a Research Proposal describing the research progress that has been made by the student since entering the graduate program, as well as a plan for dissertation research. This proposal will include a literature review, details of the experimental or computational facilities that have been used, a description of the experiments or studies that have been performed and the results from this work, and a detailed plan for the proposed future research that would be anticipated to complete the thesis work.

A general guideline for an acceptable style of the proposal can be found in the Grant Proposal Guide published by the National Science Foundation. The student's advisor or the Program Director can provide additional details. The final proposal shall be submitted to the student's research advisor and the dissertation committee at least two weeks prior to the proposed date of the oral examination. Students must have completed the core courses before taking the preliminary examination.

To schedule the oral prelim exam:

1. The student's program of study must be on file.
2. The student must obtain a Preliminary Examination Scheduling form from the Graduate School, or by going to their forms page at <https://gradschool.wsu.edu/facultystaff-resources/18-2/>
3. The form must be signed by the student's committee members, the MSEP Director, and by a representative of either the College of Arts and Sciences or the Voiland College of Engineering and Architecture.
4. After the form is returned to the Graduate School, the Graduate School will schedule the Prelim no sooner than 10 working days from that time.

The student's advisor and dissertation committee members will conduct the oral examination. Any graduate faculty members who wish to attend may also be present. The oral exam will determine whether the student is making satisfactory progress in his/her research, whether he/she is able to apply knowledge obtained in the classroom to his/her research, and whether his/her plan for future research meets the requirements for that of a PhD. The oral examination will have duration of approximately 2 hours. A passing or failing grade on the oral examination will be the decision of the student's research advisor and the dissertation committee. The student may be permitted to retake the oral examination if the first attempt is not successful. Failure on the second examination eliminates candidacy.

### **Guidelines for Proposals for Preliminary Examination (MSEP)**

1. Length:

Your proposal should be approximately 15 pages long (single-spaced, 12-point times new roman font, 1" margins), including figures and tables. References, in full citation format, are to be added to the end of the proposal and are in addition to the recommended length.

2. Format:

One example format is the National Science Foundation (NSF) format available online at: [http://www.nsf.gov/pubs/policydocs/pappguide/nsf10\\_1/gpg\\_2.jsp#IIB](http://www.nsf.gov/pubs/policydocs/pappguide/nsf10_1/gpg_2.jsp#IIB)

Please consult with your advisor as you prepare for your Prelims. He/she can guide you as you prepare your proposal.

### **Forms**

All forms can be found on the Graduate School's website. Whenever possible, all forms should be taken to the Academic Coordinator of the Materials Science and Engineering Program for review prior to the Director's signature. All forms will be reviewed for adherence to the MSEP guidelines, core course requirements, and transfer credit approvals.

### **Dissertation and Final Examination**

The student's doctoral committee is responsible for guiding the student through the research and dissertation and will follow existing Graduate School procedures.

The scheduling for the dissertation defense requires that the student first submit the dissertation to the dissertation supervisor for review and obtain his/her approval of the content. The dissertation supervisor will sign the Final Examination Scheduling form (<http://www.gradsch.wsu.edu/Forms/>) only when the dissertation is in a final and acceptable form. A copy of the dissertation and the scheduling form will then be submitted to the members of the student's dissertation committee and the Program Director for approval at least two weeks before the defense date. The MSEP Director will only sign those schedule forms that have been signed by all members of a student's committee. One electronic copy should be sent to the MSEP Academic Coordinator.

## QUICK REFERENCE GUIDE STEPS AND MILESTONES FOR MSEP STUDENTS

<b>Procedure</b>	<b>Under the Direction of</b>	<b>Date</b>
Obtain a faculty advisor	Check with Program Director	As soon as possible after admission to the Graduate School, but no later than the end of the first semester.
Meet with Committee	Faculty Advisor	Annually
Submission of proposed Program of Study to MSEP	Advisor, dissertation committee, with final approval from Program Director	In the first year of the program-committee selected and proposed coursework established.
Program of study submitted to Graduate school for final approval	Associate Dean of the Graduate School	Due at the beginning of a student's 3 <sup>rd</sup> semester as a Ph.D. student.
Scheduling of Preliminary Exam	Advisor, Program Director, final approval from Graduate School	By the first semester of 3 <sup>rd</sup> year
Filing for All-But-Dissertation (ABD) status, after passing the Preliminary Exam	Paperwork is handled by the MSEP, department finance officer and the Graduate School.	At least 3 weeks prior to the start of the semester for which ABD status is sought. Has to be re-filed whenever there is a change in funding source.
Application for Degree (in preparation to graduate)	Application can be found online at <a href="https://portal.wsu.edu/">https://portal.wsu.edu/</a>	Check with Graduate school on the deadline, should be done no later than the beginning of the semester in which you plan to graduate.
Schedule Final Defense	Advisor, dissertation committee, Graduate School	Scheduling form must be submitted 10 business days prior to the date of the defense. Check with Graduate School for submission deadlines.
After a successful defense: submit 100% cotton pages and an electronic copy of the dissertation to the Graduate School.	Graduate School, dissertation committee (must sign your signature page)	Within 5 business days of the date of your defense.

All relevant forms can be found at <https://gradschool.wsu.edu/facultystaff-resources/18-2/>

## MSEP CURRICULUM

### **CORE COURSES:** (12 credits)

As an interdisciplinary program, MSEP requires its students to take classes in a broad range of materials areas. To accomplish this, students must take one mandatory course (MATSE 505, Advanced Materials Science) plus 3 other courses from **3 of the other categories** listed below. In each category are a list of approved courses that satisfy that category.

Note that this list contains courses in several departments, and students should contact these home departments of the course for questions, including scheduling. Whenever a course is cross listed with a MATSE course, students should sign up for the MATSE course. When a course is cross listed as MSE and another prefix, students should sign up for the MSE course.

The table on the next page contains the year/semester when the course is typically offered, but these are subject to change. Some departments list a projected schedule of course offerings, such as MME (MSE and ME course prefixes) at:

[https://s3.wp.wsu.edu/uploads/sites/473/2019/06/MME\\_5\\_year\\_plan\\_2019-2024\\_draft.pdf](https://s3.wp.wsu.edu/uploads/sites/473/2019/06/MME_5_year_plan_2019-2024_draft.pdf) .

Schedules of classes can be found for the current academic year at: <http://schedules.wsu.edu/>.

Requests for alternate courses are made on an exception basis, such as when requesting transfer credits or filing a program of study. 500 level special topics courses will be considered, as will appropriate 400- and 500-level courses from WSU Urban Campuses. In the case of requesting an alternate course, a syllabus in English must be supplied, and the Director has the final say as to whether a course may be acceptable for the program of study. This list of approved courses may be updated in the future based on approval by the Faculty Senate.

### **ADDITIONAL COURSES:** (9 credits)

In addition to the 4 CORE courses (MATSE 505 + 3 CATEGORIES), 3 additional courses are required. Additional courses are selected by the student in consultation with their research advisor and thesis committee. Any 400-500 level courses in engineering (e.g., MSE, ME, CE, CHE, EE, BioEng), the physical sciences (e.g., PHYS, CHEM), and mathematics (e.g., MATH, STAT) are usually acceptable unless they have been used for credit in the undergraduate program. Any of the courses listed under the core (above), which have not been counted towards the satisfying the core requirement, may be counted as additional course(s).

### **SEMINAR:** (6 credits)

MATSE 593 Seminar in Materials Science & Engineering (1). Repeated for adequate credit. In rare cases, other courses units may be substituted for these units with the permission of the Director.

### **RESEARCH CREDITS:**

At least 20 credits of MATSE 800. Typically, more than 20 credits are necessary to make up the total of required 72 hours for the PhD degree.

### **OTHER REQUIREMENTS:**

Program of study must satisfy Graduate School requirements (72 total credits, minimum of 20 credits of 800).

- Up to 9 credits of 300- or 400-level courses may be included in the Program of Study with committee and Director approval (section a-iii, <https://gradschool.wsu.edu/chapter-six-g2/>).
- Up to 10 transfer credits may be applied to the Program of Study from another institution, either from an MS degree or other graduate work, providing grade was at least “B”. For MSEP, these courses must either be approved as alternates to CORE classes, be considered as ADDITIONAL courses, or merely accepted as additional credit hours. For these transfers, an English copy of the syllabus must be provided. For more details see (section e, <https://gradschool.wsu.edu/chapter-six-g2/>).
- Students must provide a completed MSEP Program of Study spreadsheet at the time of submission of the Program of Study, where requested alternates to approved CORE classes, whether WSU or transfer, are requested; the spreadsheet can be found at <http://materials.wsu.edu/documents/2017/08/msep-course-planner.xlsx>.
- For the most up to date copy of the graduate school policies and procedures, see <https://gradschool.wsu.edu/159-2/>, and deadlines, see <https://gradschool.wsu.edu/deadlines/>.

#### **EXAMPLE OF COMMON STUDENT CREDIT DISTRIBUTION**

12 (CORE) + 9 (ADDITIONAL) + 6 (SEMINAR) + 45 (RESEARCH) = 72 CREDITS

A good place to look for courses is the online WSU catalog. Some potential courses can be found at links below, including brief descriptions of these courses:

- <http://www.catalog.wsu.edu/General/Academics/Courses/MATSE>
- <http://www.catalog.wsu.edu/General/Academics/Courses/MSE>
- <http://www.catalog.wsu.edu/General/Academics/Courses/ME>
- <http://www.catalog.wsu.edu/General/Academics/Courses/CE>
- <http://www.catalog.wsu.edu/General/Academics/Courses/CHE>
- <http://www.catalog.wsu.edu/General/Academics/Courses/CHEM>
- <http://www.catalog.wsu.edu/General/Academics/Courses/PHYSICS>
- [http://www.catalog.wsu.edu/General/Academics/Courses/E\\_E](http://www.catalog.wsu.edu/General/Academics/Courses/E_E)



## TABLE OF MSEP APPROVED CORE CLASSES

	CATEGORY	Course #/ title	Normally offered
0	Mandatory core	MATSE/MSE 505 – Advanced Materials	F – annually
1	Thermodynamics/ Kinetics	CHEM 531 – Advanced Physical Chemistry I MATSE/MSE 516 – Phase Transformations ME 526 – Statistical Thermodynamics ME/CHE 527 – Macroscopic Thermodynamics MSE/ME 514 – Thermodynamics of solids PHYS 533 – Thermal and Statistical Physics I PHYS 534 – Thermal and Statistical Physics II	F – annually S – even years S – odd years S – even years (UI) F – even years S – annually S – annually
2	Solid State	CHEM 480 – Solid State Chemistry EE 496 – Semiconductor Devices MSE 515 – Electronic Properties of Materials PHYS 463 – Introduction to Solid State & Materials Physics PHYS 563 – Physics of the Solid State	F – odd years F – annually F – even years S – annually F – annually
3	Quantum Mechanics	CHEM 532 – Advanced Physical Chemistry II # CHEM 534 – Chemical Statistical Mechanics CHEM 564 – Molecular Phenomena PHYS 450 – Introduction to Quantum Mechanics PHYS 550 – Quantum Theory I	F – annually S – odd years S – even years F – annually F – annually
4	Materials Processing	MSE 404 – Engineering Composites MSE 508 – Polymer Nanocomposites and Functionalities MSE 523 – Ceramics Processing MSE 543/CE 593 – Polymer Materials and Engineering MSE 544/CE 593 – Natural Fibers MSE 545/CE 595 – Polymer and Composite Processing MSE 546/CE 596 – Engineered Wood Composites MSE/ME 507 – Additive Manufacturing	S – annually F – odd years S – even years S – even years F – odd years S – odd years F – even years F – odd years
5	Materials Characterization	CHEM 514 – Mass Spectrometry CHEM 535 – Applied Spectroscopy MATSE 571 – Microscopic Analysis of Solid Surfaces	F – odd years F – annually S – annually
6	Advanced Chemistry	CHEM 501 – Advanced Inorganic Chemistry I CHEM 520 – Advanced Analytical Chemistry CHEM 521 – Radiochemistry CHEM 532 – Advanced Physical Chemistry II # CHEM 542 – Advanced Organic Chemistry	S – odd years F – odd years F – even years F – annually F – annually
7	Solid Mechanics	CE 514 – Advanced Mechanics of Materials MATSE/MSE/ME 513 – Crystal Plasticity ME 501 – Continuum Mechanics ME/BioEng 525 – Biomechanics MSE/ME 520 – Multiscale Modeling Thermomech. Mater. MSE/ME 530 – Elasticity MSE/ME 531 – Theory of Plasticity MSE/ME 534 – Mechanics of Composite Materials MSE/ME 537 – Fracture Mechanics and Mechanisms	F – annually F – even years F – even years S – odd years S – even years F – odd years S – even years F – odd years S – odd years
8	Transport	CHE 510 – Transport Processes ME 515 – Advanced Heat Transfer ME 516 – Conduction and Radiation Heat Transfer ME 521 – Fundamentals of Fluids I ME 556 – Numerical Modeling in Fluid Mechanics	F – annually S – even years F – odd years F – even years F – odd years
9	Multi-component Systems	CHE 585 – Interfacial Phenomena MATSE/MSE 506 – Biomaterials MSE /ME 517 – Thin Films	S – even years F – odd years S – odd years
10	Applied mathematics	MATH 540 – Applied Mathematics I MATSE/MSE 521 – Statistics of Microstructures PHYS 571 – Methods of Theoretical Physics STAT 512 – Design and Analysis of Experiments STAT 523 – Statistical Methods for Engineers and Scientists	F,S – annually S – odd years* F – annually F, S – annually S – annually

\*irregularly offered; #cannot be counted for two categories

Some other courses which are not currently categorized or approved as CORE but are in the WSU catalog and may be of interest to MSEP students include the following. Courses marked @ are special topics and the course content may change each semester offered, with only some topics being relevant to MSE.

## COURSES OF INTEREST

WSU offers numerous courses, not considered CORE, but may still be of interest to MSEP students. A non-comprehensive list is given here.

- MATSE/MSE 503 – Advanced Topics in Materials Engineering<sup>@</sup> (Previous topics include Electrochemistry, Nanotechnology and Glass Science & Technology)
- MSE/ME 509 – MEMS Engineering
- MSE 592 – Transmission Electron Microscopy
- CHEM 509 – Chemical Group Theory
- CHEM 529 – Selected Topics in Analytical Chemistry<sup>@</sup>
- CHEM 550 – Special Topics in Nuclear Processes and Radioactive Waste Management
- EE 504 – Modern Optics
- EE 518 – Advanced Electromagnetic Theory I
- EE 520 – Plasma Engineering
- CE 501 – Advanced Topics in Transportation Engineering<sup>@</sup>
- CE 508 – Concrete Durability
- CE 518 – Hazardous Waste Engineering
- PHYS 410 – Electronics
- PHYS 443 – Optics
- PHYS 465 – Introductory Nuclear Physics
- PHYS 466 – Biophysics
- PHYS 514 – Optoelectronics Lab I
- PHYS 521 – Classical Mechanics I
- PHYS 541 – Electromagnetic Theory
- PHYS 542 – Electrodynamics
- PHYS 545 – Nonlinear Optics
- PHYS 546 – Quantum Electronics
- PHYS 581 – Advanced Topics<sup>@</sup>

<sup>@</sup>Special topics courses can be repeated for credit within approved limits.

## **GOOD STANDING/MAKING PROGRESS TOWARD YOUR DEGREE**

To be considered “in good standing” (i.e., making progress toward your degree), an MSEP graduate student should fulfill the following conditions:

1. Maintain a GPA of **3.0** or above. Please note that the GPA of your formal coursework (not including supplementary English courses, PE courses, etc.) must also be **3.0** or above.
2. Be accepted into the laboratory of an MSEP faculty member by the end of the second semester of your first year.
3. Submit all required paperwork (program of study, exam scheduling forms, etc.) to the Graduate School in a timely manner.
4. Form a graduate thesis committee by the end of your first year.
5. Meet with your thesis committee at least once a year. (Note: it is your responsibility to arrange extra meetings with your thesis committee should problems arise. **If your GPA falls below 3.2, you must hold a committee meeting to review your progress.** Committee meetings can be requested by the student or advisor at any time.)
6. Complete an annual review with your advisor every year at the end of spring semester. A copy of this review will be sent to your advisor.
7. Uphold the Student Conduct Policy and Academic Integrity Policy of Washington State University.

Failure to remain in good standing may result in loss of financial support and termination from the program.

Requests for an exception to policy should be submitted in writing to the MSEP director by the student’s advisor. Documented approval from thesis committee members may be required. After the appropriate approvals have been acquired, the MSEP chair may write an exception to policy letter to the Dean of the Graduate School.

## **LEAVE AND VACATION**

During the term of their appointments, all graduate students service appointees are expected to be at work each normal workday, **including periods when the University is not in session with the exception of the legal holidays designated by the Board of Regents.**

All University holidays are designated by the Board of Regents and are published in the WSU and posted on the Web at <http://hrs.wsu.edu/resources/holiday-schedule/> .

For more information on Graduate student leave, please go to:

<http://gradschool.wsu.edu/CurrentStudents/PoliciesAndProcedures/Chapter5/OfficialLeavesOfAbsence.html>

Graduate students on appointment do not earn annual leave or sick leave.

## ESTABLISHING WASHINGTON RESIDENCY

This section applies only to U.S. citizens and permanent residents; international students will receive out-of-state tuition waivers every semester that they are on an assistantship)

For the first semester that you are enrolled in the MSEP program at WSU, you will receive a special waiver that allows you to pay in-state tuition if your place of residence is not Washington State. However, in order for this to continue, you *must* be a legal Washington resident at the beginning of your second year of study or you will be charged out-of-state tuition. The program will not cover the difference between in-state and out-of-state tuition.

To gain residency, it is important that you do the following:

- Live in Washington State for your entire first year of graduate school.
- Keep a copy of your lease(s) to show that you have been physically present in the state.
- Obtain a Washington State driver's license (or a Washington ID card if you do not drive). This should be done as soon as you arrive in Pullman so that it will be at least 12 months old when you apply for residency. Keep a copy of your license and receipt in case you lose it and have to get a replacement at a later date.
- If you have a car, register it immediately with the Washington Department of License and transfer your car insurance to a local agent if your insurance company does not have a local branch. You must register any car you own or use within 30 days of your arrival. If the car belongs to someone else (parents, spouse, sibling, friend), it still must be registered in the state of Washington if you are using it as a regular means of transportation while residing in this state.
- Obtain a voter registration card as soon as you arrive in Pullman (can be done at the same time you get your driver's license).
- Establish an account at a local bank (the Washington State Employees Credit Union has free ATMs that are on or near campus).
- If you are  $\leq 24$  years of age, you must prove that you have been financially independent for the 12 months you have resided in Washington. This means that you cannot be listed as a dependent on your parents' tax returns in the year preceding the year that you file your paperwork.

It is a very good idea to also keep copies of bills, bank statements, etc., that show your local address to support your residency application.

We also advise that you look over the Washington State University Residence Questionnaire (found in the appendix and online) so that you know exactly what pieces of information to save.

More information about the process can be found at:

<http://residency.wsu.edu/residency-requirements/>.

<https://gradschool.wsu.edu/establishing-residency/>

<http://gradschool.wsu.edu/?p=4734>

## INSURANCE AND PAYROLL

### **Graduate Student Insurance**

Washington State University automatically pays health and dental insurance for students who have assistantships and provides the Health and Wellness Services (HWS) clinic on campus. HWS provides medical, minor surgical, urgent care, and wellness programs for students who have paid the university health and wellness fee (but not their dependents). Basic visits to the clinic are free, although you may be charged for x-ray, laboratory, and physical therapy services, and for filled prescriptions. For a complete description of HWS services, go to: [www.hws.wsu.edu](http://www.hws.wsu.edu).

The Graduate Student Assistant Insurance is designed to help you pay for expenses you may incur outside of the HWS clinic. Coverage is available worldwide. To find out more about the Graduate Student Insurance plan for domestic and international students please visit <https://studentinsurance.wsu.edu/insurance101/>. It is also possible to arrange for one's spouse or same-sex domestic partner and children to be included in the Graduate Student Assistant Insurance.

### **Pay Dates, Payroll Deductions, and Graduate Fees**

Pay checks are issued on the 10<sup>th</sup> and 25<sup>th</sup> of each month (or the next working day if either day falls on a weekend). It is possible to arrange direct deposit with the university and your bank so that your check is automatically deposited that day; otherwise, it will be sent through the mail. Direct deposit forms are available from Payroll Services in French Admin 236 or at <http://payroll.wsu.edu>.

Payroll deduction allows for graduate fees to be withdrawn from your paychecks over eight pay periods instead of all at once. You must be on an assistantship and sign up every semester if you want this service. Enrollment is available during the first three weeks of the semester only at the Payroll Services office and online. Fees for the current academic year are as follows (per semester):

Numbers for 2018-2019:

Residual Tuition, Service and Activity Fees	\$441.00
Student Recreation Center Fee	\$157.00
Health & Wellness Fee	\$204.00
CUB Renovation Fee	\$120.00
Pullman Transit Fee	\$32.74
<b>Total</b>	<b>\$954.74</b>

For more information, go to <https://payroll.wsu.edu/student-pay/gradfees.htm>.

## **GRADUATE SCHOOL AND MSEP RESOURCES**

WSU and the MSE PhD program are committed to maintaining a social and academic environment conducive to the educational mission of the institution. While it is hoped that each student's experiences at WSU will be positive, difficulties can and do occasionally arise. If concerns arise, it is imperative for graduate students to know of options available for resolution.

The course of action is to seek resolution at the lowest possible level with one's advisor, any of one's thesis committee members, the graduate/program coordinator, or the program chair. If a student is unable to remedy the situation through these means, or if there is a reason why these individuals cannot be approached, problems can be taken directly to another appropriate office.

Because of the wide variety of issues that may beset students, there are several options available in addition to the Graduate School. Students may, for instance, consult the Office of the Ombudsman or the Center for Human Rights at any point in working toward the resolution of a problem. It should be realized, however, that the Ombudsman, by definition, cannot serve as student advocate but may facilitate contact with individuals or units at the University. Concerns which are brought to the Graduate School may likewise draw on these or other resources within the University, as necessary.

Academic issues brought before the Graduate School are typically handled by the Associate Deans of the Graduate School. Appeals of college or unit level decisions are handled by the Dean of the Graduate School in consultation with the Associate Deans. Graduate students' appeals process involve several steps: adjudication at the unit level, adjudication at the college level with, if necessary and appropriate, a final appeal to the Dean of the Graduate School. Unusual academic matters and some combinations of conduct and academic matters may be referred to the Committee on Graduate Student Rights and Responsibilities (CGSRR). In the case of strictly academic matters, the CGSRR consists of graduate faculty only. In matters consisting of both academic and conduct issues, the CGSRR is composed of graduate faculty and graduate students recommended by the Graduate Studies Committee. The CGSRR will operate with due respect to the rights of graduate students and graduate faculty, including the conduct of confidential interviews, the rights of all parties to review and address allegations, and rights to a fair hearing. Once allegations are brought to the Graduate School in writing, the CGSRR will be formed within 30 days and will deliberate and render a recommendation to the Dean of the Graduate School within 60 days. This recommendation will be acted upon by the Dean in consultation with the Provost and the Attorney General. The final outcome of this process may be appealed to the Dean of the Graduate School, who will then follow the procedures outlined above.

Appeals can be brought before the Provost. The Provost will consider appeals based on procedural irregularity and will not reopen cases only for the purpose of re-investigating the grievance.

In all instances, the University seeks fair and expeditious action on academic and conduct issues. Resolutions must uphold the highest standards of academic freedom and integrity, while honoring the rights and dignity of all individuals in the University community.

For more information about Graduate Student Rights and Responsibilities, see:

<https://gradschool.wsu.edu/rights-and-responsibilities/>

## **OTHER UNIVERSITY RESOURCES**

### Dean of Students Office: 335-5757

The WSU Office of the Dean of Students connects students with the services, opportunities, and resources to foster their success at WSU and after graduation. By working with university and community partners, we advise students about services, resources, and options that support their success and provide guidance and assistance during times of challenge, crisis, complexity or emergency.

Many university resources can be accessed from this office on the first floor of the French Administration building. Some of these can be reviewed at: <https://gradschool.wsu.edu/graduate-student-resources/>. Information about services including financial aid (loans, scholarships), family resources (food, childcare subsidies), mental health resources (counseling and psychological services), and international community networks can be obtained from this office.

### Academic Integrity Program: 335-4532; <http://academicintegrity.wsu.edu/>

The Academic Integrity Program at WSU's main goal is to help students graduate with a strong foundation of knowledge and experience by fostering personal accountability for their academic work.

### Counseling and Testing Services: 335-4511

Offers specialized individual and group counseling and testing services without charge to any regularly enrolled student. A staff of professionally trained counselors is available to provide confidential assistance to students with personal, social, academic, or couple concerns. Group counseling and workshops are provided to help students with personal development and adjustment and to cope with such issues as eating disorders and sexual assault and abuse. Crisis services and consultation are available on a 24-hour basis.

### The Center for Human Rights: 335-8288

Assists all University students, faculty and staff in areas of discrimination (i.e., sexual harassment and racial harassment).

### Office of Veterans Affairs: 335-1234

Assists all WSU students who are veterans or dependents of veterans with issues including health and educational benefits, recall to duty, and other veterans' issues.

### Women's Resource Center: 335-6849

Coordinates programs which support the success and empowerment of women; provides information and consultations for individuals and groups planning activities related to women; resource and referral center on issues such as sexual assault, health care, child care, counseling, law, etc.

### Gender Identity/ Expression and Sexual Orientation Resource Center: 335-6388

Services provided to gay, lesbian, bisexual students and heterosexual allies; referrals for counseling, education and advocacy.

Access Center: 335-2322

Plans and coordinates services for students with physical impairments, permanent health problems, and learning disabilities.

Office of International Students and Scholars: 335-4508

Assist with international students and visiting faculty with legal (immigration & naturalization), non-academic, and social adjustments.

Intensive American Language Center: 335-6675

Teaches English courses to international students and scholars.

Multicultural Student Services Center: 335-7852

Primarily for undergraduates, but there are some resources available for graduate students; refer to specific students centers for more information on graduate student resources.

African American Student Center: 335-2626

Asian/Pacific American Student Center: 335-1986

Chicano/Latino Student Center: 335-2616

Native American Student Center: 335-8676

## **SAFETY**

Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Safety is a priority in which the university invests significant time and resources. We have emergency plans and procedures that are reviewed regularly and that can be implemented quickly in a crisis or emergency. Our focus over the past year on expanding communication resources and practices has enhanced our ability to effectively maintain our campus safety.

Safety is not the exclusive responsibility of any one individual, department, or office. Every member of the campus community should recognize that it is a shared responsibility and that each of us has a personal role in campus safety. Leaders at all levels including deans, directors, chairpersons, and department heads must take an active role in working with faculty, staff and students to foster an environment of safety awareness by providing necessary training and by setting an example for others to follow. Individual faculty, staff, and student should know the appropriate actions to take when an emergency arises. Their understanding of University safety and security procedures will help emergency personnel fulfill their responsibilities when emergencies do arise.

We ask that all faculty, staff, and students visit the University emergency management web site at <https://oem.wsu.edu> to become familiar with the student and classroom emergency information provided. Everyone should also become familiar with the WSU ALERT site (<https://alert.wsu.edu/>) where information about emergencies and other issues affecting WSU can be found. This site also provides information on the communication resources WSU will use to provide warning and notification during emergencies.

WSU is fully committed to keeping the community informed of public safety issues and emergency procedures as well as providing protection, education, and other services that enhance your safety and well-being. Please stay informed of the services and information available and remain vigilant



and aware of your circumstances at all times so that we can work together to ensure a safe working and learning environment.

For additional information about campus safety please visit the Office of Emergency Management website at <http://oem.wsu.edu>.

## **LIVING IN PULLMAN**

### Sources of Information

The Pullman Chamber of Commerce will send you a free visitor packet of information that includes a map and local coupons. You can request the packet and find lots of other useful information (housing, things to do, important phone numbers, etc.) at their website: <http://pullmanchamber.com/>.

### Housing

It is important to start looking for housing early because houses and apartments rent very quickly in Pullman. Many units become available for lease in March for the upcoming school year. Since you need to establish residency in Washington within a year of arrival, you ***cannot*** live in Moscow, Idaho. Also, while it is sometimes cheaper to live in Colfax, WA, note that there is no public transportation between Colfax and Pullman.

University accommodations are available, including single and married student apartments. A graduate student resident hall containing single rooms is located near the center of campus. Information on University housing can be found at <https://housing.wsu.edu/>. Many students live in off-campus housing within walking distance of the university

### Transportation & Parking

Many students at WSU own cars, but it is not necessary. There are many apartments within walking distance of campus. Also, your student fees allow you to ride Pullman Transit for free after showing your WSU Cougar Card (go to <http://www.pullman-wa.gov/departments/pullman-transit> for route and schedule information).

If you have a car and will be parking on campus, try to obtain a permit soon after you arrive. A map of parking locations and a list of fees can be found at <https://transportation.wsu.edu/>.

### Travel to and from Pullman

The Pullman-Moscow Airport (PUW) is nearby but somewhat expensive. If you have a car, it may be cheaper to fly in and out of Spokane International Airport (GEG), which is about 80 miles north. Wheatland Express offers limited shuttle service from Pullman to the Spokane Airport. There are also flights out of Lewiston, ID, Lewiston-Nez Perce County Airport (LWS) that you may sometimes find more convenient.

List of Helpful Businesses and Services

<p>Pullman Chamber of Commerce          415 N. Grand Ave.          Pullman, WA          (509) 334-3565  <a href="http://pullmanchamber.com/">http://pullmanchamber.com/</a></p>	<p>Pullman Regional Hospital          835 S.E. Bishop Blvd          Pullman, WA          (509) 332-2541  <a href="http://www.pullmanregional.org/">http://www.pullmanregional.org/</a></p>
<p>Brelsford WSU Visitor Center          (info, sports tickets, etc.)          150 E Spring Street          Pullman, WA          (509) 335-INFO (4636)  <a href="https://visitor.wsu.edu/">https://visitor.wsu.edu/</a></p>	<p>WSU Student Recreation Center          (509) 335-UREC  <a href="https://urec.wsu.edu/facilities/student-rec-center/">https://urec.wsu.edu/facilities/student-rec-center/</a></p>
<p>Department of Licensing          (driver's license, voter registration)          980 S. Grand Ave.          Pullman, WA          (509) 334-2510  <a href="http://www.dol.wa.gov">www.dol.wa.gov</a></p>	<p>Avista Utilities          (electricity, gas)          (800) 227-9187          (509) 229-3310  <a href="http://www.avistautilities.com">www.avistautilities.com</a></p>
<p>Vehicle Title and Registration          Pufferbelly Depot          330 N. Grand Ave, Suite B          Pullman, WA          (509) 332-5589</p>	<p>Pullman Disposal          (waste disposal)          (509) 334-1914  <a href="http://pullmandisposal.com/">http://pullmandisposal.com/</a></p>
<p>Whitman County Auditor          (voter registration)          310 N. Main St.          Colfax, WA          (509) 397-4622  <a href="http://www.whitmancounty.org/auditor">www.whitmancounty.org/auditor</a></p>	<p>City of Pullman          (water, sewer)          825 NW Guy Street          Pullman, WA          (509) 338-3243  <a href="http://www.pullman-wa.gov/">http://www.pullman-wa.gov/</a></p>
<p>WSU Health and Wellness Services          1125 NE Washington Avenue          Pullman, WA          (509) 335-3575  <a href="https://hws.wsu.edu/">https://hws.wsu.edu/</a></p>	