Advanced Manufacturing as a Primary Option in Mechanical Engineering

Academic Timeline for a PhD

1. **Program of Study:** The PhD Program of Study (POS) should be submitted by the student before completing 18 credit hours of OSU coursework and must be completed before the end of a student’s fifth term at OSU. The PhD POS should include a plan for a minimum of 108 credits, including at least 48 credits of coursework and 36 credits of thesis (ME 603). The balance may either constitute additional coursework and/or thesis credits or come from other sources such as reading and conference (ME 605). The maximum number of blanket numbered credits is 15. Blanket numbered credits are those with a zero in the middle digit that are not thesis credits. Coursework requirements for Advanced Manufacturing as a primary option in Mechanical Engineering must include at least 16 credit hours of coursework from the list of courses below. Note that this list is not exhaustive and substitutions may be made on a case-by-case basis by the Advanced Manufacturing members of the student’s committee.

1. **Advanced Manufacturing Seminar**
   MFGE 507 Seminar: Advanced Manufacturing (1)
   *(Advanced Manufacturing students attend MFGE 507 each term and enroll once.)*

2. **One or more Materials Science course(s)**
   MATS 555 Experimental Techniques in Materials Science (4)
   MATS 570 Structural Property Relations in Materials (4)
   ME 580 Materials Selection (3)
   ME 588/MATS 588 Computational Methods in Materials Science (4)

3. **One or more Manufacturing Process course(s)**
   MFGE 531 Micromanufacturing (4)
   MFGE 538 Composites Manufacturing (4)
   MFGE 599 Computational Modeling for Advanced Manufacturing (4)
   MFGE 599 Additive Manufacturing (3)

4. **One or more Manufacturing Systems course(s)**
   IE 552 Design of Industrial Experiments (3)
   ME 526/NE 526 Numerical Methods for Engineering Analysis (3)
   ME 597 Precision Motion Generation (4)
   MFGE 535 Industrial Sustainability Analysis (3)
   MFGE 536 Lean Manufacturing Systems Engineering (4)
   MFGE 599 Sensor Design for Manufacturing (4)
The **PhD Program Meeting** will include a short presentation (no more than 10 slides) by the student providing their academic background, including prior courses taken, a short synopsis of thesis research interests, and their proposed POS, including a discussion of how it meets PhD program requirements set forth above (e.g., identifying course substitution approvals). The meeting will be conducted by the student’s PhD committee in the presence of a graduate council representative (**GCR**). The committee may make recommendations for additional coursework based on technical interests and/or programmatic requirements.

2. **Qualifying Examination:** The qualifying examination will be conducted during the second winter term after the student enters the PhD program. Sixteen or more credits from the above prescribed coursework must be completed prior to the qualifying examination following the requirements below.

   *Minimum Requirements:* Earn a combined GPA of 3.0 or better in Advanced Manufacturing option coursework, as well as a B- or better in all individual courses taken at OSU during the PhD program. Courses can be retaken as needed prior to the deadline stated above. The Advanced Manufacturing faculty will meet in the first week of each winter term to review the academic record of each qualifying student in the Advanced Manufacturing PhD program. The faculty will make a recommendation on each student’s qualification for the PhD program (pass or fail) based on the qualifying requirements. Though called an examination, the student is not present at the review meeting. The student will pass or fail this examination solely on the merit of their transcript.

3. **Preliminary Examination:** The preliminary examination focuses on the proposed thesis research and includes the following components:
   
   a) A written research proposal describing the literature review and summary of technical challenges justifying the thesis research as well as the objective(s), specific approach(es), and research methodology(ies) needed to conduct the research, along with any preliminary results, as appropriate;
   
   b) An oral presentation to the student’s PhD committee defending the thesis research proposal, which will be followed by an oral exam.

   PhD preliminary examinations must be scheduled through the Graduate School using the [Exam Scheduling Form](#). The student must be formally enrolled (for a minimum of three graduate-level credits) during the term in which the preliminary examination takes place. The student will distribute their written research proposal to the PhD committee no later than two weeks prior to the exam. The oral presentation and oral examination should be not less than two hours in length.

   The preliminary examination should be conducted no earlier than three months after the student completes the qualifying examination requirements. Upon the successful completion of the preliminary examination, the student is considered a PhD candidate.
4. **Final Oral Examination**: Upon completion of the student’s thesis work, a final oral examination will be conducted with the student’s PhD committee consisting of the following components:

   a) A final written thesis document (including any published manuscripts); and
   b) A final oral presentation to the student’s PhD committee defending the completed thesis.

The student will distribute their final written thesis document to the PhD committee no later than two weeks prior to the exam. Scheduling of the oral presentation and examination should be two hours.

At least one academic term must lapse between the term that the preliminary examination is taken and the term that the final oral examination is taken. Note that if more than five years elapse between completing the preliminary examination and the final oral examination, a second preliminary examination will be required prior to taking the final oral examination. This includes the requirement to allow an additional academic term to transpire between the preliminary examination and the final oral examination.

It is expected that all members of the graduate committee should be physically present at all graduate examinations required by the Graduate School. However, it is permissible for the student, and/or committee members to participate from a remote location provided certain conditions have been met.