
Mechanical Engineering Graduate Program

Requirements for PhD students

REQUIREMENT:

COMPLETION DATE:

1. Confirm the name of your thesis advisor by the end of the first semester. Only a regular member of the Graduate Faculty can serve as an advisor of a doctoral dissertation. _____/_____/_____
Primary thesis advisor name: _____
(optional) Co-thesis advisor name: _____

2. Complete **15 credit hours of coursework at UVM** beyond all M.S. credits earned at UVM or at another academic institution. For students entering the PhD program without an M.S. degree, a minimum of 39 credit hours of coursework at UVM is required. _____/_____/_____

3. Complete at least **15 credit hours in graduate-level mechanical engineering coursework at UVM** from any areas of specialization below (including cross-listed courses outside of mechanical engineering). This can include M.S. credits earned at UVM. **At least 9 credits must be at the 300 level or above.** _____/_____/_____

4. Complete 9 additional credit hours in graduate-level Engineering, Mathematics, Statistics, Physical or Life Sciences. _____/_____/_____

5. Pass the **Doctoral Comprehensive Examination**. See below guidelines regarding the Doctoral Comprehensive Exam. _____/_____/_____

6. Complete the **teaching requirement** by either: _____/_____/_____
A. giving 2 public seminars or conference presentations
B. serving as a Graduate Teaching Assistant (GTA) for one semester.

7. Select your **Thesis Defense Committee**. The Thesis Defense Committee must consist of at least four members of the UVM Graduate Faculty. At least two Graduate Faculty members must be from the mechanical engineering graduate program. The Chairperson must be both a member of the Graduate Faculty and from outside the mechanical engineering program. The Chairperson will be designated by the Graduate Dean upon nomination by the dissertation advisor. _____/_____/_____

8. Pass **Dissertation Proposal**. A proposal of the dissertation research must be presented to and approved by the Thesis Defense Committee. The Doctoral Comprehensive Exam must be passed prior to the Dissertation Proposal. _____/_____/_____
9. Complete a minimum of **20 hours of thesis credits (ME491)** supervised by the dissertation advisor prior to the doctoral thesis defense, with the expectation that the student's research must culminate in original works publishable in peer-reviewed journal articles. _____/_____/_____
10. Complete a total of **75 credit hours**. A minimum of 51 credit hours must be accumulated in residence at UVM combining both credits taken for coursework and independent research. Up to 24 credits hours is allowable for transfer from other institutions. Also, up to 24 hours of coursework for which graduate credit is earned at UVM in an M.S. program may be applied toward a Ph.D., provided the credit is appropriate for a Ph.D. _____/_____/_____
11. Pass the **Thesis Defense**. The Thesis Defense committee will decide on the pass/fail status of the candidate's thesis credits. _____/_____/_____
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AREAS OF SPECIALIZATION IN MECHANICAL ENGINEERING:

Bioengineering and Biomechanics Area	<p>ME201. Biomaterials Engineering ME207. Bioengineering ME208. Biomechanics: Tissue Engr. ME209. Biomechanics: Transport Proc. ME213. Systems & Synthetic Biology ME312. Adv. Bioengineering Systems Any approved course at the 200 or 300 level in Biomechanics area as offered</p>
Control Theory and Design of Mechanical Systems Area	<p>ME203. Machinery Analysis & Synthesis ME210. Control Systems (cross-listed with EE210) ME230. Orbital Mechanics ME234. Mechanical Vibrations ME270. Structural Dynamics (cross-listed with CE272) ME271. Micro and Nano Systems ME338. Advanced Dynamics Any approved course at the 200 or 300 level in Control Theory and Mechanical Systems area as offered</p>
Materials Engineering and Solid Mechanics Area	<p>ME201. Biomaterials Engineering ME252. Mechanical Behavior of Materials ME255. Advanced Engineering Materials ME257. Composite Materials ME259. Computational Solid Mechanics ME271. Micro and Nano Systems ME333. Stress Analysis ME350. Multiscale Modeling Any approved course at the 200 or 300 level in Materials Engineering and Solid Mechanics area as offered</p>
Thermodynamics, Fluids and Energy Area	<p>ME237. Turbulence ME238. Energy Systems Engineering ME239. Rocket Propulsion ME240. Compressible Flow ME241, 342. Combustion Processes, Advanced Combustion ME242, 344. Adv. Engr. Thermodynamics I, II ME243. Incompressible Flow ME245, 345. Advanced Heat Transfer I, II ME249. Computational Fluids Engr ME343. Advanced Fluid Dynamics Any approved course at the 200 or 300 level in Thermo-Fluids-Energy area as offered</p>
Computational Mechanics Area	<p>ME218. Numerical Methods for Engineer (cross-listed with CE218) ME249. Computational Fluids Engr ME259. Computational Solid Mechanics ME350. Multiscale Modeling (cross-listed with CYS350) Any approved course at the 200 or 300 level in Computational Mechanics area as offered</p>

Doctoral Comprehensive Examination for the Ph.D. Degree in Mechanical Engineering

- a. The Doctoral Comprehensive Exam is administered by the Graduate Program of the Department of Mechanical Engineering at UVM. The candidate must pass **a combined written and oral examination**.
- b. The doctoral comprehensive examination will be offered twice a year, December or May, by the end of the second calendar week in each case, unless otherwise noted.
- c. The candidate is given a maximum of two opportunities to pass the examination.
- d. Candidates must inform the Mechanical Engineering Graduate Program Director at the beginning of the semester in which the examination may be offered.
- e. The examination subject matter must cover **four courses** at the Doctorate level that the student has taken in the prior or current semesters. A doctoral comprehensive examination committee consisting of **3 mechanical engineering graduate faculty** and **1 from outside the program** will be the examiners. A faculty member with secondary appointment in the mechanical engineering program can be considered as the outsider.
- f. The first part of the examination will be in a written closed-book format that has two 2-hour sessions. The second part of the examination is the oral portion with each examiner. The written examination must be graded before the oral examination.
- g. Following the oral examination, each examiner will directly report to the mechanical engineering graduate program director who will decide on the pass/fail status, and inform the UVM Graduate College about his/her decision.