

DOCTOR OF PHILOSOPHY (PHD) DEGREE IN THE FIELD OF MATERIALS SCIENCE AND NANOENGINEERING

Program Learning Outcomes for the PhD Degree in the field of Materials Science and NanoEngineering

Upon completing the PhD degree in the field of Materials Science and NanoEngineering, students will be able to:

1. Demonstrate an advanced command of Materials Science and NanoEngineering field work.
2. Conduct independent research that demonstrates advanced mastery of a subfield within Materials Science or NanoEngineering.
3. Communicate scientific ideas effectively in writing and when speaking.

Requirements for the PhD Degree in the field of Materials Science and NanoEngineering

Full-time students seeking the PhD degree are expected to complete all the requirements for the degree within five calendar years following entrance into the program. Continuation in the program beyond this time limit will require special approval of the department.

For general university requirements, please see [Doctoral Degrees \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-doctoral-degrees/\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-doctoral-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see [All Graduate Students \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/). Students pursuing the PhD degree program in Materials Science and NanoEngineering must complete:

- A minimum of 90 credit hours advanced relevant study, of which at least 18 credit hours must be completed through coursework.

The programs leading to the MS and PhD degrees are open to students who have demonstrated outstanding performance in their undergraduate studies. The granting of a graduate research degree presupposes academic work of superior quality and a demonstrated ability to do original research.

Course requirements for the research degrees vary depending on the extent of individual undergraduate preparation as well as each student's performance in graduate courses and on qualifying examinations. For both the MS and PhD degrees, students must present a thesis that comprises an original contribution to knowledge and defend it in a public oral examination.

Students are expected to earn letter grades of at least B- (2.67 grade points) in all courses taken, and maintain a minimum overall GPA of 3.00.

If a student's semester GPA is below 3.00, the student will be placed on departmental probation, and if the student's semester GPA is below 3.00

for two consecutive semesters, their performance will be reviewed by the Graduate Committee in consultation with the Department Chair, and the student may be dismissed from the program.

Each graduate student is expected to render research and/or instructional assistance to the department not to exceed 10 hours per week. Graduate student work assignments will be made by the advisor at the beginning of each semester.

All PhD students must attend at least 75% of the MSNE seminars per semester. For details, please see the degree requirements on the [MSNE website \(https://msne.rice.edu/\)](https://msne.rice.edu/).

The requirements listed in the General Announcements (GA) satisfy the minimum requirements for this degree program. In certain instances, courses (or requirements) not officially listed here may be substituted upon approval of the program's academic advisor or, where applicable, the department or program's Director of Graduate Studies. Course substitutions or any exceptions to the stated official curricular requirements must be approved by the [Office of Graduate and Postdoctoral Studies \(https://graduate.rice.edu/\)](https://graduate.rice.edu/). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the PhD Degree in the field of Materials Science and NanoEngineering		90

Degree Requirements

Code	Title	Credit Hours
Core Requirements ¹		
MSNE 502	MECH PROPERTIES OF MATERIALS	3
MSNE 503	THERMODYNAMICS IN MATERIALS SCIENCE	3
MSNE 506	PHYSICAL PROPERTIES OF SOLIDS	3
MSNE 535 / PHYS 535	CRYSTALLOGRAPHY & DIFFRACTION	3
Elective Requirements		
Select 2 courses as Electives from departmental (MSNE) course offerings at the 500-level or above ²		6
Non-Coursework ³		
MSNE 500	MATERIALS SCIENCE SEMINAR ⁴	1
MSNE 501	GRADUATE STUDENT SEMINAR ⁵	1
MSNE 589	ETHICS & SAFETY FOR MATERIALS ENGINEERS ⁶	1
or UNIV 594	RESPONSIBLE CONDUCT OF RESEARCH	
MSNE 800	RESEARCH AND THESIS ⁷	9
Additional Requirements as Defined by Department		71
Total Credit Hours		90

Footnotes and Additional Information

- ¹ Students may petition to replace a Core Requirement with a related non-MSNE course offering upon approval from the Departmental Graduate Committee.

- 2 Students may complete courses that satisfy the Electives requirement from other departmental course offerings upon approval from their advisors or one member of the Departmental Graduate Committee.
- 3 Credit received for MSNE 500, MSNE 501, MSNE 589, UNIV 594, and MSNE 800 will not be counted toward coursework, but will count toward the total credit hours required for the degree.
- 4 Students must attend at least 10 of the 13 MSNE 500 seminars per semester for the duration of their study
- 5 Students must attend at least 9 of the 13 MSNE 501 seminars per semester for the duration of their study
- 6 Students must register for MSNE 589 or UNIV 594 for one semester for the duration of their study.
- 7 Students must register for a minimum of 9 credit hours of MSNE 800 per semester. This course is taken for a Satisfactory/Unsatisfactory grade and must be completed with a Satisfactory grade. As a S/U course, the minimum grade requirement of B- (2.67 grade points) does not apply. For more information, see the Grades section of the MSNE Graduate Student Handbook on the [Policies](#) (p. 2) tab.

Additional Information

Graduate students pursuing a thesis degree program will be subject to a preliminary evaluation of their candidacy for the highest degree program they intend to pursue. The evaluation will be conducted by the end of the second semester of enrollment in the graduate program in the MSNE department.

By the end of the sixth semester of enrollment in the graduate program in the MSNE department, the student must pass an oral qualifying examination.

Each candidate for the PhD degree must complete a thesis that constitutes an original contribution to scientific knowledge (analytical or experimental). It is expected that the research will be of sufficient importance and quality that positive results would lead to publication. On completion of the thesis, each candidate for the PhD degree must pass a final public oral examination. The examination will be conducted by a committee consisting of at least three members. Two, including the advisor, must be MSNE faculty members, and one must be a faculty member from another department.

Candidates for the PhD degree program in Materials Science and NanoEngineering are required to provide teaching assistance to the department as a teaching assistant or grader for at least 3 semesters, but no more than 4 semesters.

For additional details and information, please see the degree requirements on the [MSNE website](https://msne.rice.edu/) (<https://msne.rice.edu/>).

Policies for the PhD Degree in the field of Materials Science and NanoEngineering

Department of Materials Science and NanoEngineering Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the department of Materials Science and NanoEngineering publishes a graduate program handbook, which can be found here: https://gradhandbooks.rice.edu/2024_25/Materials_Science_NanoEngineering_Graduate_Handbook.pdf.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer) (<https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer>). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content) and by the Office of Graduate and Postdoctoral Studies (GPS). Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

Additional Information

For additional information, please see the Materials Science and Nanoengineering website: <https://msne.rice.edu/>.

Opportunities for the PhD Degree in the field of Materials Science and NanoEngineering

Additional Information

For additional information, please see the Materials Science and Nanoengineering website: <https://msne.rice.edu/>.