

M.S. in Robotics Engineering

Degree Type

Master of Science

The M.S. program in Robotics Engineering requires 30 credit hours of work. Students may select a non-thesis option, which requires a 3-credit capstone experience, or a thesis option which requires a 9-credit thesis. All entering students must submit a plan of study identifying the courses to be taken and a prospective project topic before the end of the first semester in the program. The plan of study must be approved by the student's advisor and the RBE Graduate Program Committee, and must include the following minimum requirements:

1. Robotics Core (15 credits)

At least 15 credits are needed. Any additional credits accrued from these courses will be counted as Electives.

Students may apply to substitute the RBE 500 requirement with credits from more advanced RBE graduate courses other than RBE 594, RBE 596, RBE 597, RBE 598, RBE 599 and RBE 699. This requires taking an equivalent course/training prior to starting to the graduate program at WPI, and the students are required to submit a petition to the RBE Graduate Program Committee for approval. Such approvals must be filed with the Registrar within one year of the date of matriculation in the program.

Foundations (9 credits)

Item #	Title	Credits
RBE 500	Foundations of Robotics	3
RBE 501/ME 501	Robot Dynamics	3
RBE 502	Robot Control	3

Core Robotics Engineering Electives (6 credits)

Any RBE 500+ other than RBE 594, RBE 596, RBE 598, RBE 599, and RBE 699.

2. Engineering Context (3 credits):

3 credits hours selected from the following courses or any SYS course at the 500 level or above:

Item #	Title	Credits
ETR 500	Entrepreneurship and Innovation	3
ETR 593	Technology Commercialization	3
MIS 576	Project Management	3
OBC 506	Leadership	3
BUS 546	Managing Technological Innovation	3

3. Capstone/Thesis (3-9 credits)

A 3 credit hour capstone experience or a 9 credit hour thesis.

4. Electives (3-9 credits)

Sufficient course work selected from courses at the 500 level or above in Science, Engineering, or Business to total 30 credit hours with the approval of the student's advisor on the Plan of Study. Courses at the 4000 level may also be taken as electives in exceptional circumstances with the additional prior approval of the RBE Graduate Program Committee. The RBE 5900 (internship) course can be taken for maximum of 1 credit per semester and a maximum of 3 credits per degree.

Thesis Option

The M.S. thesis consists of 9 credit hours of work, normally spread over at least one academic year. A thesis committee will be set up during the first semester of thesis work. This committee will be selected by the student in consultation with the major advisor and will consist of the thesis advisor, who must be a full-time WPI RBE faculty member, and two other faculty members, at least one of whom is a WPI RBE faculty member, whose expertise will aid the student's research program. An oral presentation before the Thesis Committee and a general audience is required. In addition, all WPI thesis regulations must be followed.

Non-Thesis Option

As an alternative to a 9-credit research-based thesis, students may elect a 3-credit capstone from the following options:

- Capstone Project Experience in Robotics Engineering (RBE 594),
- Robotics Engineering Practicum (RBE 596),

or

- Directed Research (RBE 598).

All non-thesis options must demonstrate significant graduate-level work involving Robotics Engineering, include substantial analysis and/or design, and conclude with a written report and public presentation.

The Capstone Project Experience in Robotics Engineering (RBE 594) is a project-based course that integrates theory and practice and provides the opportunity to apply the skills and knowledge acquired in the Robotics Engineering curriculum. The project is normally conducted in teams of two to four students. Students are encouraged to select projects with practical significance to their current and future professional responsibilities. The projects are administered, advised, and evaluated by WPI faculty as part of the learning experience, but students are also encouraged to seek mentorship from experienced colleagues in the Robotics Engineering profession. The project must include substantial analysis and/or design, and conclude with a written report and public presentation.

The Robotics Engineering Practicum (RBE 596) provides students an opportunity to put into practice the principles that have been studied in previous courses. It will generally be conducted off campus and will involve a real-world robotics-engineering situation. Overall conduct of the practicum will be supervised by a WPI RBE faculty member; an on-site liaison will direct day-to-day activity. For a student from industry, the practicum may be sponsored by his or her employer. The project must include substantial analysis and/or design related to Robotics Engineering and will conclude with a public presentation and substantial written report. There can be no confidential or proprietary company information in the project.

The Directed Research (RBE 598) option provides a research-oriented means to satisfy the capstone requirement. The student and research advisor will agree on the specific topics and deliverables on a per-project basis. The project must include substantial research, analysis and/or design related to robotics engineering and will conclude with a substantial written report and public presentation. The research advisor of the RBE 598 course must be affiliated with the RBE Department.

Item #	Title	Credits
	3-credit Robotics Engineering (RBE) capstone	3

Transfer Credit

A student may petition for permission to use graduate courses taken at other accredited, degree-granting institutions to satisfy RBE graduate degree requirements. A maximum of 12 graduate credits, with a grade of B or better, may be satisfied by courses taken elsewhere and not used to satisfy degree requirements at other institutions. Petitions are subject to approval by the RBE Graduate Program Committee, and are then filed with the Registrar. Transfer credit will not be allowed for undergraduate-level courses taken at other institutions. In general, transfer credit will not be allowed for any WPI undergraduate courses used to fulfill undergraduate degree requirements; however, note that there are exceptions in the case of students enrolled in the B.S./M.S. program.

A student with one or more WPI master's degrees who is seeking an RBE master's degree from WPI may petition to apply up to 9 prior credits toward satisfying requirements for the subsequent degree. Petitions are subject to approval by the RBE Graduate Program Committee. Students who take graduate courses at WPI prior to formal admission to the RBE graduate program may petition to apply up to 9 graduate credits to fulfill the RBE graduate degree requirements. Once again, petitions are subject to approval by the RBE Graduate Program Committee.

3-credit Robotics Engineering (RBE) capstone

3

As an alternative to a 9-credit research-based thesis, students may elect a 3-credit capstone from the following options:

- Capstone Project Experience in Robotics Engineering (RBE 594),
- Robotics Engineering Practicum (RBE 596),

or

- Directed Research (RBE 598).

Item #	Title	Credits
RBE 594	Capstone Project Experience in Robotics Engineering	3
RBE 596	Robotics Engineering Practicum	3
RBE 598	Directed Research	3