Available only on a full-time basis in:

- Master’s Programs
  • Physics
  • Operations and Information Technology
  • Mechanical Engineering
  • Mathematical Sciences
  • Materials Science and Engineering
  • Manufacturing Engineering
  • Marketing and Technological Innovation
  • Interdisciplinary Studies
  • Industrial Mathematics
  • Financial Mathematics
  • Construction Project Management
  • Computer Science

Available, on a full-time and part-time basis, in the following disciplines:

- Degree Programs
  • Master of Business Administration (M.B.A.) Program
  • Master of Mathematics for Educators (M.M.E.) Program

The number of courses offered each year may be limited in some disciplines; however, the schedule of courses over a period of time generally allows a student taking three or four courses per semester to complete the course requirements in about two years. Students taking two courses per semester complete the course requirements for the master of science or engineering degrees in about three years, or the master of business administration degree in about four years.

Questions relating to these programs should be referred to the discipline department heads or the Graduate Studies & Enrollment Office.

Master of Science (M.S.) Degree Programs
Available, on a full-time and part-time basis, in the following disciplines:

- Applied Mathematics
- Applied Statistics
- Biomedical Engineering
- Chemical Engineering
- Chemistry and Biochemistry
- Civil and Environmental Engineering
- Computer Science
- Construction Project Management
- Electrical and Computer Engineering
- Financial Mathematics
- Fire Protection Engineering
- Industrial Mathematics
- Interdisciplinary Studies
- Marketing and Technological Innovation
- Manufacturing Engineering
- Materials Science and Engineering
- Mathematical Sciences
- Mechanical Engineering
- Operations and Information Technology
- Physics

Master’s Programs
Available only on a full-time basis in:

- Biology/Biotechnology
- Chemical Engineering

Master of Engineering (M.E.) Programs
Offered in:

- Biomedical Engineering
- Civil and Environmental Engineering

Master of Business Administration (M.B.A.) Program
Provides students with strategies for the successful application of technology to complex business environments. The degree requirements are described in this catalog and in a separate brochure available from the Department of Management at 508-831-5218.

Master of Mathematics for Educators (M.M.E.) Program
WPI offers a specific part time program (since 1975), Masters in Mathematics for Educators, for teachers of mathematics at the middle school, secondary, and junior college levels. Students in this program may earn a content-based degree afternoons and evenings while still teaching full time. Taught by professors of mathematics at WPI, the program is designed to permit the teachers to learn from professors’ research interests and includes an understanding of current developments in the field. Scholarship aid, which covers approximately 40% of the cost of tuition, is available to qualified participants. This degree may be used to satisfy the Professional License requirements of Massachusetts for teachers holding the Initial License.

Interdisciplinary Masters Programs
New fields of research and study that combine traditional fields in innovative ways are constantly evolving. Because of this, WPI encourages the formation of interdisciplinary master’s programs to meet new professional needs or the special interests of particular students. Currently there are 3 Interdisciplinary MS degree programs: Impact Engineering, Manufacturing Engineering Management, and Power Systems Management.

Interdisciplinary master’s programs may include a thesis or project requirement and require at least 30 credits beyond the bachelor’s degree. Proposals for such programs are initiated by groups of at least two faculty members from different academic departments who share a common interest in a cross-disciplinary field and are submitted to the Committee on Graduate Studies and Research (CGSR). At least one member of the group submitting the proposal must be from a department or program currently authorized to award the master’s degree, and no more than half of the total academic credit may be taken in any one department.

Application requirements include a graduate studies application, $70 application fee, official academic transcripts from all post-secondary institutions, three letters of reference, and a plan of study signed by advisors from the cooperating departments. All documents are to be sent to the Graduate Studies & Enrollment Office.

The Doctor of Philosophy (Ph.D.) Program
Available in biomedical science, mathematical sciences and all of the disciplines outlined previously except management programs, mathematics for educators, financial mathematics and industrial mathematics.
Interdisciplinary Doctoral Programs

New fields of research and study that combine traditional fields in innovative ways are constantly evolving. In response to this, WPI encourages formation of interdisciplinary doctoral programs to meet new professional needs or the special interests of particular students. Such programs are initiated by groups of at least three full-time faculty members who share a common interest in a cross-disciplinary field. A sponsoring group submits to the Committee on Graduate Studies and Research (CGSR) a proposal for an interdisciplinary degree, together with the details of a program of study and the credentials of the members of the group. At least one member of the group must be from a department or program currently authorized toward the doctorate.

If the CGSR approves the proposal, the sponsoring group serves in place of a department in establishing specific degree requirements beyond those of the Institute, in advising, in preparing and conducting examinations, and in certifying fulfillment of degree requirements.

WPI and the University of Massachusetts Medical School have developed a graduate biomedical engineering program, jointly administered by the two institutions.

Graduate and Advanced Certificate Programs

Keeping pace with technological advancement today is a never-ending task. At WPI, our innovative graduate level certificate programs are strategically established to help update a professional person’s understanding of advancing technology with insights and the study of new concepts, without necessitating a major commitment of the student’s time and resources.

WPI offers two certificate program options for individuals wishing to pursue graduate course studies: the Graduate Certificate Program (GCP), and the Advanced Certificate Program (ACP). Each program offers the benefit of academic advising by WPI faculty, without necessitating a commitment to a full degree program. Upon completion of the appropriate course series, the student is awarded the applicable certificate in the area of specialization. GCP course credits may be applied to a WPI graduate degree, at the discretion of the appropriate department graduate committee, if the student is admitted to a degree program at a later date in the same discipline.

Graduate Certificate Programs

The Graduate Certificate Programs (GCP) provide an opportunity for students holding undergraduate degrees to continue their study in an advanced area. A B.S. or B.A. degree is the general prerequisite; however, some departments look for related background when making admission decisions. These programs require students to complete four to six (depending on the certificate) thematically related courses in their area of interest. The details of individual certificates, and the number of courses involved, are listed in the “WPI Graduate Certificate Programs” publication. Each student’s program of study must be approved by their Academic Advisor at the start of the program. The number of courses required for a certificate is generally set by the department awarding the certificate, and (at the discretion of the assigned Academic Advisor) may include an extra course, for example to compensate for weak preparation in a specific area.

Biomedical Engineering
- (Undergraduate degree in engineering or science preferred)
- Medical Instrumentation and Devices

Civil and Environmental Engineering
- (Undergraduate degree in Civil Engineering or another acceptable field preferred)
- Construction Project Management
- Environmental Engineering
- Master Builder
- Materials/Transportation
- Structural Engineering
- Geotechnical Engineering

Computer Science
- (Undergraduate degree in Computer Science or Computer Engineering preferred; students with other backgrounds may need to take additional courses prior to admission into these programs)
- Artificial Intelligence
- Computer and Communications Networks
- Database Design
- Graphics/Image Processing/Visualization
- Programming Languages
- Software Engineering and Interface Design

Electrical and Computer Engineering
- (Undergraduate degree in Electrical or Computer Engineering preferred)
- Computational Fields
- Computer Systems
- Computer and Communications Networks

Fire Protection Engineering
- (Undergraduate degree in science or engineering preferred)
- Computer Modeling
- Industrial Applications
- Failure Analysis/Investigation
- Performance-based design
- Other mutually agreed theme

Mathematical Sciences
- (Knowledge of differential equations equivalent to that provided by an introductory college course required for the Industrial Mathematics Certificate Program; knowledge of statistics equivalent to that provided by an introductory college statistics course required for the Industrial Statistics Certificate Program)
- Industrial Mathematics
- Industrial Statistics

Management
- (Undergraduate degree in science, engineering or management preferred; individuals holding bachelor’s degree in other disciplines with relevant work experience also considered.)
- Information Security Management
- Information Technology
- Management of Technology
- Technology Marketing
- Customized Certificate of Management

Manufacturing Engineering
- (Undergraduate degree in engineering, mathematics or computer science preferred)

Materials Science and Engineering
- (Undergraduate degree in engineering, chemistry, physics or mathematics preferred)

Additional concentrations may be developed in consultation with an academic advisor.
Advanced Certificate Programs

The Advanced Certificate Programs (ACP) provide Master’s degree holders with an opportunity to continue their studies in advanced topics in the disciplines in which they hold their graduate degree or that are closely related to their Master’s degree fields. The ACP programs consist of a set of five courses, none of which were included in the student’s formal Master’s program, or in another certificate program. The courses may include either a depth or a breadth option.

Each participating department identifies one or more guideline programs; however, each student’s program of study may be customized to satisfy the student’s unique interests. The program of study is reviewed and approved by an Academic Advisor who is assigned upon the student’s acceptance to the program.

Advanced Certificate individuals may also apply for admission to department M.S. or Ph.D. graduate programs closely related to their previously earned Master’s degree fields. Each department’s Graduate Committee will review such applications on a case-by-case basis to determine the applicant’s eligibility. ACP individuals applying to graduate programs under this scenario would follow the same admission procedures as individuals applying to graduate programs who do not hold a WPI Master’s degree. Credits used towards another WPI certificate or degree may not be applied to an Advanced Certificate. Advanced certificates are available in the following (with a few example specializations areas listed as bullet items):

Civil and Environmental Engineering
- Waste Minimization and Management
- Building Regulatory Integration in Construction Management
- Computer Based Support Systems for Construction Management

Computer Science
- Advanced Computer Systems
- Advanced Computer Science
- Artificial Intelligence
- Data and Knowledge Based Systems
- Compilers and Languages
- Image Science

Electrical and Computer Engineering
- Electrical and Computer Engineering
- Computational Fields
- Computer and Communications Networks
- Advanced Computer Systems

Fire Protection Engineering
- Computer Modeling
- Industrial Applications
- Failure Analysis/Investigation
- Performance-based design
- Other mutually agreed theme

Mechanical Engineering
- Computational Mechanics
- Fluid Mechanics
- Stress Analysis
- Vibrations and Controls
- Manufacturing Engineering
- Materials Science and Engineering

Additional specializations may be developed in consultation with an academic advisor.

General Information on Certificates

Application
Application to a GCP or ACP program requires submitting an official application form, official copies of transcripts for all college course work completed, and a $70 application fee (waived for WPI alumni) to the Graduate Studies & Enrollment Office. Management certificate applicants must also submit three letters of recommendation and GMAT/GRE scores. International students may apply to these programs, however for WPI to issue the Form I-20 for a student visa, international students must be registered for a minimum of 9 credits during their first semester, and must complete their program within one academic year.

Admission and Matriculation
No certificate will be awarded without prior acceptance into a certificate program. Admission to a certificate program of any department is granted by the faculty of the sponsoring department. A student accepted into a M.S. or Ph.D. degree program cannot retroactively apply to a certificate program.

Casual Course Takers Not Yet Admitted to a Certificate or Graduate Program

Casual course takers with an earned bachelor’s degree may elect to take one or two courses without applying to a certificate program. This is considered non-degree status. But the fact that a student has been allowed to register for graduate courses (and earn credit) does not guarantee that student will be admitted to that department’s certificate or graduate program at a later date. Students are therefore encouraged to apply for admission to a certificate program prior to any course registration.

If a student intends to apply to a certificate program, the student must be admitted prior to the completion of the 2nd course. Only two courses taken prior to application to a certificate program may be counted toward the certificate. If the student goes beyond the second course as a non-degree student, then that student may apply to a WPI graduate degree program, but will not be eligible to apply to or receive a graduate certificate.

Switching From a Certificate Program to a Graduate Degree Program

Many certificate students eventually choose to apply to a WPI graduate degree program. Admission to a certificate program is not equivalent to admission to a degree program. Students enrolled in a certificate program who would like to pursue a M.S. or Ph.D. degree must meet the application and admission requirements for the degree program as specified in the graduate catalog.

Certificate students who have been denied admission to a degree program, have not applied to a degree program, or have an incomplete degree program application on file, will receive pass-fail grades for all credit earned beyond the certificate requirements.

Once accepted to both a GCP program and a degree program, no more than 6 credits from a degree program may be used to meet the GCP requirements. No credits may be double counted between an ACP and a graduate program.
**Earning a Second Certificate**

If a certificate student intends to pursue a second certificate in the same discipline, an application for admission to a degree program is required prior to the completion of the first course taken as part of the additional certificate. After applying to WPI’s graduate program, if the student chooses not to complete that degree, he/she can still continue with the second certificate if accepted into that second certificate program.

A student admitted into a certificate program who wishes to work towards a second certificate offered by a different department or program must apply to that second certificate program for admission.

Courses counted towards one certificate may not count towards another certificate.

**Registration Procedures**

GCP and ACP students register at the same time as regular WPI graduate students, follow the same registration procedures, and participate in the same classes.

**Tuition and Fees**

Tuition and fees for GCP and ACP students are the same as for all other WPI graduate students on a per-credit-hour basis.

**Academic Policies**

Certificate academic policies regarding acceptable grade point averages follow the same guidelines as those established for degree-seeking graduate students, with the following exception: if after completing 9 credits, a certificate program student’s grade point average falls below 2.5, he/she will be withdrawn from the program unless the academic department intervenes.

**Program Planning**

Certificate students will be assigned a faculty Academic Advisor, and will be required to complete a Plan of Study. The Plan of Study must be approved and signed by the Academic Advisor before the end of the student’s first semester in the program. The student, the Academic Advisor and the department will maintain copies of the plan. Students may initiate written requests to the advisor, via the Program Modification Form, to modify the Program of Study. The student, the Academic Advisor and the department should retain copies of any approved program modification(s).

**Completion Time Limit**

Certificate students will have four years from the date of matriculation to complete their program. International students may apply to these programs, however for WPI to issue the required student visa, international students must be registered for a minimum of 9 credits during their first semester, and must complete their program within one academic year.

**Transfer of Credits**

A maximum of 6 credits from another university may be used towards a certificate.

**Program Completion**

Satisfactory certificate completion requires a cumulative grade point average of 3.0 or better (A = 4.0), with individual course grades of C or better in each course completed in the certificate program. Upon satisfactory completion of the program, students will receive a certificate of graduate study or advanced graduate study in the chosen discipline. Students are responsible for submitting the signed completed plan of study to the Registrar’s office to receive the approved certificate.

**Combined Bachelor’s/Master’s Program**

The Combined Bachelor’s/Master’s Program is a unitary program leading a student to a bachelor of science degree and to a master of business administration, master of engineering, or master of science degree. The purpose of the Combined Bachelor’s/Master’s Program is to give WPI undergraduates an opportunity to earn a bachelor’s and a master’s degree from WPI concurrently in less time than would be required if the student were to complete work on the bachelor’s degree before beginning work on the master’s degree. To gain the full benefit of this program, a student should apply for the Combined Program well before the bachelor’s degree is completed. Application at the beginning of the junior year is recommended.

For the master of science and master of engineering degrees, the Combined Program typically allows a student to complete requirements for both degrees in about one more year of full-time study than would be required to earn the bachelor’s degree. With careful planning, a student can obtain a similar reduction in the amount of time required to earn an M.B.A. Undergraduate students may apply up to four courses to the master’s degree, with prior written approval from professors and the academic department. The M.S. portion of the program must be completed as a full-time student. See page 19 and 23 for more details.

**Advanced Study for Nondegree Students**

For those who do not want to commit themselves to a degree program but who wish to enroll in a single course or a limited number of courses in a specialized field, WPI provides the opportunity to participate in graduate level courses on an ad hoc basis. When registering for courses as a nondegree student, grading may be either conventional (A, B, C) or Pass/Fail. Pass/Fail grading must be elected at the time of registration, and courses taken on the Pass/ Fail basis are not transferable to any master’s degree program. The maximum number of courses that may be taken as a nondegree student is four, with the following exceptions: three-course maximum in biomedical engineering, and electrical and computer engineering; two-course maximum in Management.

**Intercollege Studies and the Consortium**

The Colleges of Worcester Consortium was established in 1967. In the Consortium, 20,000 students of eight four-year colleges with graduate programs, two two-year schools, a medical school and a veterinary school have access to all the educational benefits of these institutions as well as nine other specialized institutions in the area. The Consortium members and associates whose facilities and programs have been particularly useful to WPI graduate students are Assumption College, Clark University, College of the Holy Cross, Tufts School of Veterinary Medicine, University of Massachusetts Medical School, Worcester Foundation for Biomedical Research and Worcester State College. Cross-registration in courses and the use of special laboratory facilities are encouraged. The Consortium operates a free bus service for transporting students between the colleges. Schedule for services can be found in the Gordon Library.