

UNIQUE OPPORTUNITIES AT WPI

SECTION

five

The Collaborative for Entrepreneurship & Innovation	248
Student Exchanges	248
3-2 Programs	250
Project-Based Learning Community Option (PLC).....	250
Worcester Consortium Course Cross-Registration	250
Cooperative Education Program	251
Summer Study (Term E)	252
Societies, Registration and Licensing	252

THE COLLABORATIVE FOR ENTREPRENEURSHIP & INNOVATION

Today, it would be hard to find a high school student in the U.S. (and many other nations) who is not aware of the possibilities of starting and owning a business. Everyday, the newspaper, radio, television, and Worldwide Web are full of stories about people who have started their own businesses and become wildly successful. Considerably less attention is paid to the point that virtually every one of those successful businesses was founded through innovation, the act of commercializing an invention.

At WPI, we know that most inventions come from the engineers and scientists of the world. Of course, we want to attract students and faculty members who want to be inventors. But we want more for them, too. We want them to understand the innovation process so they can turn their inventions into businesses. That is why we developed the COLLABORATIVE FOR ENTREPRENEURSHIP & INNOVATION.

The Collaborative for Entrepreneurship and Innovation (CEI) at WPI is part of the Department of Management. It coordinates opportunities for undergraduate and graduate students within WPI, such as the WPI chapter of the international organization, Collegiate Entrepreneurs Organization (CEO), and is available for consultation on Intellectual Property issues and concerns that students and faculty members might have related to projects. The other major component of the CEI, the WPI VENTURE FORUM, coordinates the outreach opportunities for WPI students and faculty members, as well as those outside of WPI.

Everything we do in the CEI is driven by our mission and goals, which you will find below. That is because we are providing our students with an integrated experience that will help them become the very best entrepreneurs in the world.

OUR MISSION

The Collaborative for Entrepreneurship and Innovation inspires and nurtures people to discover, create, and commercialize new technological products and services, and to create new organizations based on those products and services, thereby advancing economic development and improving society.

OUR GOALS

We will:

- Attract students and faculty members to WPI who are interested in using inventions and technology to foster new businesses;
- Foster informed risk-taking among our undergraduate and graduate students and others wishing to pursue the dream of entrepreneurship;
- Build bridges between WPI students, staff, faculty, and alumni, and the wider entrepreneurial business community;
- Encourage corporations to develop an environment that celebrates entrepreneurship as a combined act of discovery, creativity, and innovation; and

- Achieve a leadership role among the preeminent entrepreneurship programs in the U.S.
- Currently the CEI offers a number of opportunities to WPI students. These include:
- A minor in Entrepreneurship through our parent organization, the Department of Management.
 - Courses in Entrepreneurship for those who do not wish to take a minor.
 - MQP and IQP opportunities in Entrepreneurship.
 - An Entrepreneur-in-Residence, a rotating position staffed by an entrepreneur who offers a course in entrepreneurship once a year.
 - An external advising team of entrepreneurs and investors who are available to mentor aspiring entrepreneurs among our students.
 - The New England Collegiate Entrepreneur Award, which students can apply for if they have their own business while still undergraduates. Even though it is a region-wide competition, it has thus far been won only by WPI students.
 - Networking opportunities through activities with our community outreach arm, the WPI Venture Forum.
 - A student organization, the Collegiate Entrepreneurs Organization (CEO) at WPI, part of a nationwide organization that supports and fosters entrepreneurial intentions among college students.

The CEI@WPI ALL-OUT Business Plan Challenge. All WPI students are eligible to compete for \$50,000 in prizes and the opportunity to advance to other competitions.

For more information on the Collaborative for Entrepreneurship and Innovation, please contact Gina Betti, Associate Director, CEI, 226 Washburn at 508-831-5075; gbetti@wpi.edu.

STUDENT EXCHANGES

As technology and commerce become increasingly international in outlook, students in engineering, science and management must learn about countries and cultures other than their own. To respond to this need, WPI offers its students an extensive range of opportunities to broaden their academic and cultural perspectives through study in a foreign country. Unlike many other exchanges, the WPI program is structured to allow students to work directly with foreign students, faculty, and professionals, and to live in residences with the students of the host institution. For WPI students on these exchanges, time is usually available for additional travel, before or after the formal academic period.

WPI presently offers undergraduate exchanges with universities in Canada, Germany, Mexico, Sweden and Switzerland as described in detail below.

These exchange programs typically involve third-year students, though qualified sophomores and seniors have been accepted. Students could go on these exchanges for a semester or a full year. Where perfecting a foreign language is part of the program, as in Switzerland, Germany, or Sweden, a full year abroad is more common.

The principal academic emphasis in all exchanges is upon course work. In such programs, students must work closely with their advisor, the academic advisor of the exchange program, and the program coordinator at the site to design an individual program of study. Students have the responsibility of obtaining prior tentative approval from their department that courses taken abroad will count towards departmental distribution requirements. For final transfer credit evaluation, students must provide upon return the necessary detailed information on the content of courses taken abroad and the satisfactory completion of all work. In some exchanges, opportunities exist to complete project work (IQP, MQP, and Sufficiency). The exchanges offer exceptional possibilities for projects comparing American and overseas applications of technology and the impact of technology on society.

For more information on these programs, consult with Pamela O'Bryant in the Project Center or the academic advisor listed for each program.

LANGUAGE REQUIREMENTS

The usual language of instruction at most of the exchange institutions is the official language of the host country. While these institutions may offer a few courses taught in English, most lectures will be given in a foreign language. Thus, exchange students who intend to complete substantial course work must acquire the necessary language background. In some cases intensive language instruction can be arranged on site. In other cases, students acquire the language background through courses taught at WPI or other colleges, or by self study. A few exceptions exist at some technical universities where the official language of instruction may be English. For information about language requirements, inquire with the academic advisor listed for each program or Pam O'Bryant in the Project Center.

ECOLE POLYTECHNIQUE; MONTREAL, QUEBEC, CANADA; EXCHANGE

Coordinator: Pam O'Bryant, Project Center
Academic Advisor: Prof. W. A. Bland Addison, Salisbury Labs 02

The Ecole Polytechnique de Montreal provides WPI students with the opportunity to study in French without incurring the cost of transatlantic travel. École Polytechnique is located in the beautiful cosmopolitan city of Montréal, known for a rich variety of cultural activities and easy access to winter sports. This program offers a unique opportunity for an inside look at the cultural and political struggles for francophone identity within Québec today. Students reside among French speaking students in the residence halls of École Polytechnique. Students can work on both projects and courses in Montreal, including French language courses at the University of Montreal and courses in English at McGill University.

FEDERAL TECHNICAL INSTITUTE; ZURICH, SWITZERLAND; EXCHANGE

Coordinator: Pam O'Bryant, Project Center
Academic Advisor: Prof. David Dollenmayer, Alden 209

WPI and the Federal Technical Institute (Eidgenoessische Technische Hochschule, ETH) in Zurich, Switzerland, have arranged an exchange for WPI students learning German. ETH is a technical university of international reputation offering degree programs in agriculture, architecture, astronomy, botany, chemical engineering, chemistry, civil engineering, computer science, crystallography, electrical engineering, forestry, geography, geology, mathematics, mechanical engineering, meteorology, microbiology, petrography and physics. ETH is located in Zurich, the largest city in Switzerland, and has a student population of approximately 6,000 undergraduates and 1,000 doctoral students.

MONTERREY INSTITUTE OF TECHNOLOGY; MONTERREY, MEXICO; EXCHANGE

Coordinator: Pam O'Bryant, Project Center
Academic Advisor: Angel Rivera, Salisbury Labs 15

WPI has established an exchange agreement with Monterrey Institute of Technology (The Instituto Tecnológico y de Estudios Superiores de Monterrey, ITESM). ITESM was founded in 1943 and is the foremost private technological and management university in Mexico, with programs available in Spanish at the main campus in Monterrey in northern Mexico. Some opportunities also exist for study at selected ITESM satellite campuses at 25 other locations in Mexico, by special arrangement in advance. WPI students have excellent opportunities to study engineering, science, and management in this leading Spanish-speaking university. In addition, ITESM offers special courses for North Americans wanting to learn how to do business in Latin America, and a full program of residential and academic study for English-speaking students seeking to increase their knowledge of Spanish language and culture.

ROYAL INSTITUTE OF TECHNOLOGY; STOCKHOLM, SWEDEN; EXCHANGE

Coordinator: Pam O'Bryant, Project Center
Academic Advisor: Holly Ault, Higgins Labs 207

WPI and the Kungliga Tekniska Hogskolan (Royal Institute of Technology, KTH) in Stockholm, Sweden, have arranged an exchange for WPI students learning Swedish. KTH is a four-year technical university which is divided into ten different schools of engineering which are relatively independent of each other and control their own admissions.

The academic year, approximately August 25 to May 31, is divided into eight periods of four weeks (three weeks of classes and one week of unscheduled activities). Most

courses last three to four periods; others may be shorter or longer. Final examinations for courses are normally given three to four times a year and can be taken repeatedly without having to repeat a course. There are some courses with regular examinations. Many students live in rooms and apartments in the city of Stockholm; some live in accommodations provided by the student union. Some scholarship aid is available, and students may fulfill their Sufficiency requirement through the exchange.

TECHNICAL COLLEGE; MUNICH, GERMANY; EXCHANGE

Coordinator: Pam O'Bryant, Project Center

Academic Advisor: Prof. David Dollenmayer, Alden 209

The "Technical College" is an institute for applied technology studies. Located in Munich, the FHSM has approximately 10,000 students. It offers degree programs in civil engineering, mechanical engineering, electrical engineering and computer science/engineering. For students who have developed adequate proficiency in German, the FHSM offers the possibility of completing a co-op assignment in Germany.

TECHNICAL UNIVERSITY; DARMSTADT, GERMANY; EXCHANGE

Coordinator: Pam O'Bryant, Project Center

Academic Advisor: Prof. David Dollenmayer, Alden 209

WPI established a student exchange program with the Technische Hochschule in Darmstadt (THD) in 1989. The THD, one of the oldest in Germany, is located in central Germany, close to the main financial and transportation center of Frankfurt. In addition to providing WPI students with the opportunity to perfect their German and to study in their major fields, THD provides support for IQPs through the faculty of its Zentrum fuer Interdisziplinare Technikforschung (Center for Interdisciplinary Study of Technology).

3-2 PROGRAMS

WPI has established cooperative arrangements with Anna Maria College, Assumption College, Atlantic Union College, Clark University, Emmanuel College, Regis College, St. Lawrence University, Wheaton College and Worcester State College which enable students enrolling at those colleges to establish a program which will provide both a degree from that college and one from WPI. Students in this program would spend three years at the cooperating college and the final two years at WPI.

PROJECT-BASED LEARNING COMMUNITY OPTION (PLC)

WPI offers a program that blends Physics, Math, and Humanities together in a unified learning experience constructed around group projects and intensively utilizing educational technology. The students involved are provided with a special opportunity to explore the relationship between mathematics and science and to appreciate their place in history and society.

First Year Students who take math and physics courses and a humanities course in history of science or technology, history, literature, or philosophy during A and B Terms, are eligible for the Project-Based Learning Community option (PLC).

Benefits of the PLC include an outstanding student-to-teacher ratio (about 25 to 3); emphasis on group interaction over multiple projects; a new social community and meeting place to form lasting relationships with other students.

Each term the PLC participants take calculus, physics, and a broad humanities course designed to interrelate the three disciplines. All of these classes are held in the same room that is equipped with computers, white boards, and an ample amount of space. The environment is notably different from conventional lectures.

WPI's Project-based Learning Community (PLC) is committed to experimenting with ways of learning through the structure of small group projects and study communities.

Enrollment is limited.

WORCESTER CONSORTIUM COURSE CROSS-REGISTRATION

The Worcester Consortium for Higher Education consists of the following institutions: Anna Maria College, Assumption College, Atlantic Union College, Becker College, Clark University, College of the Holy Cross, Nichols College, Quinsigamond Community College, Massachusetts College of Pharmacy, Tufts School of Veterinary Medicine, University of Massachusetts Medical School, Worcester State College and WPI. Full-time WPI students who cross-register for courses at other Worcester Consortium colleges pay no extra fees. Students are limited to one course per semester. The no-charge plan does not include evening colleges or summer school. The Consortium provides buses which make frequent trips every day to all participating institutions.

Students interested in registering for Worcester Consortium courses should discuss their program with their advisors, and then obtain regulations and registration forms from the Director of Academic Advising or the Projects and Registrar's Office. Worcester Consortium college catalogs are available at the Gordon Library.

COOPERATIVE EDUCATION PROGRAM

THE CO-OP PROGRAM

A Division of the Career Development Center

The WPI Cooperative Education Program provides an opportunity for students to alternate time in the classroom with extended periods of paid, full-time, career-related work experience in industry or private and government agencies. The program, which is optional at WPI, entails work assignments from six to eight months in duration which begin in either January or May.

Most students elect to participate in one co-op placement, though students may choose to work for more than one assignment. Participation in the Co-op program may delay the student's graduation date by 1/2 year (or longer if the student chooses to take more than one assignment). Preparation of a total college plan with the student's academic advisor is required to ensure a compatible scheduling of work periods and academic courses.

In order to qualify for the co-op program, students must meet the following requirements:

1. they must have completed two years of study but may not participate once they have started their senior year,
2. they must be in good academic standing (students cannot be on academic warning or probation),
3. they are only permitted to register for project credit during the co-op assignment with the approval of their academic and project advisors, co-op supervisor and co-op program coordinator, and
4. they must be full-time students.

Exceptions to any of these requirements are made by submitting a written petition to the Coordinator of Cooperative Education who consults with the WPI Registrar for a final decision.

ADVANTAGES TO STUDENTS AND EMPLOYERS

Co-op offers several advantages to students:

1. Participating in co-op helps students make career-related decisions.
2. Students can test classroom learning in the real world.
3. Co-op earnings enable students to pay a significant portion of their college expenses.
4. Students improve their after-graduation job prospects by gaining valuable work experience. In fact, more and more companies are using their co-op program to identify candidates for full-time permanent positions when the students graduate and/or seek candidates with co-op experience from other companies.

Employers also benefit in a number of ways:

1. Co-op students can handle assignments that may be difficult for untrained personnel, but that do not require the talents of full-time professionals.
2. The program gives employers the chance to judge the actual on-the-job performance of potential permanent employees.

3. Retention rates for permanent employees recruited through a co-op program are higher than for those hired through other routes.

THE PLACEMENT PROCESS

Students who are interested in participating in the co-op program must register with the Career Development Center (CDC) several months before the start date of the work assignment. Registration deadlines are announced at the mandatory Co-op Orientation meeting which is held throughout the year.

Once students complete the training in resume writing and interviewing skills that the CDC provides, the placement process begins. Employers seeking to fill a co-op position provide the CDC with a brief job description. Students decide which jobs they are interested in applying for and the CDC forwards their resume to the appropriate companies. Some employers interview candidates on campus; others review resumes and then invite selected students for on-site interviews. The final hiring decision is left to the employer. The student is free to interview with more than one employer and to choose among the employment offers received. It often takes several months before the student is placed in a co-op assignment.

A co-op position is not guaranteed, but every effort is made to locate appropriate work assignments for qualified students. More than 300 employers have provided co-op opportunities to over 2000 students since the program began in 1976. The search for additional employers is an on-going activity.

OTHER CONSIDERATIONS

The employment experiences gained through the Cooperative Education Program do not substitute for, nor qualify as Major Qualifying Project (MQP) or Interactive Qualifying Project (IQP) requirements. These experiences, however, often generate ideas for qualifying projects with the cooperating companies.

For some students, the co-op orientation and registration period overlaps with an off campus activity, usually involvement with an IQP at one of our project centers. Students should not think that this prevents them from applying for co-op positions since our office has developed systems for dealing with their absence. Students who will be off campus during the orientation and registration period should contact the co-op program coordinator **before** their departure to complete the registration process in advance.

INFORMATION AND REGISTRATION

Students interested in exploring the possibility of participating in the program should contact:

Career Development Center
Coordinator, Cooperative Education Program
Project Center, Lower Level
(508) 831-5260

During the summer, many courses central to planning major programs of study are offered at a time when all facilities are easily accessible. This is a great time to

- Make up a missing course
- Lighten the load for the next year
- Speed up your time to degree completion

This term also offers an exceptional opportunity to participate in certain types of project activity on a convenient basis since classrooms and laboratories will be less crowded and outside field work unlimited due to weather conditions. The use of the independent study has made it possible to present more individually-oriented course work during this term where class sizes are generally smaller. Many courses offered during Term E are included in the supplement to the catalog which is distributed to all students in March. A special summer

study website is available at www.wpi.edu/+Summer, in March. Students planning to participate in Term E should register at the regular spring registration period.

Term E also offers an excellent opportunity to complete a qualifying project or Sufficiency through a full-time effort during a single term. Students from other campuses are also invited to participate in the work of this term.

Admission to the summer session does not imply admission to regular academic year programs. Students desiring to continue their work at WPI following the summer session should seek admission following standard WPI admissions procedures issued through the Admissions Office.

For more information on the summer session, contact the Summer Session Office at (508) 831-5999.

SOCIETIES, REGISTRATION AND LICENSING

ENGINEERING SOCIETIES

All engineers are professionals in accordance with the definition of engineering, one of which states that "engineering is the profession in which a knowledge of the mathematical and natural sciences gained by study, experience and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind." Professional engineers also observe a code of ethics, exercise judgment and discretion while providing their services, and are involved in a confidential relationship with their clients. Professional engineers enjoy legal status, use professional titles, and associate together through professional societies.

An excellent way to begin learning about the status of the professional engineer is to join the student branch of a professional society relevant to your interests. At WPI, students are encouraged to join the student branches of such societies as the American Society for Metals (ASM), American Society of Mechanical Engineers (ASME), the Institute of Electrical and Electronic Engineers (IEEE), the American Society of Civil Engineers (ASCE), the American Institute of Chemical Engineers (AIChE), the American Institute of Aeronautics and Astronautics (AIAA), the Association of Computing Machinery (ACM), the American Nuclear Society (ANS), the Society of Automotive Engineers (SAE), the Society of Manufacturing Engineers (SME), the Society of Fire Protection Engineers (SFPE), the Society of Women Engineers (SWE), and the American Chemical Society, (ACS). For information on these organizations, see the appropriate department head.

Undergraduate students should begin the process of becoming professionally registered and licensed by following the steps detailed in the next section.

ENGINEERING REGISTRATION AND LICENSING

In order to become a "Professional Engineer" (P.E.) and enjoy the legal status which affords certain rights, privileges and responsibilities, engineers must qualify through the formal procedures of registration and licensing. Procedures vary from state to state, but in most cases, the applicant must pass a Fundamentals of Engineering Examination.

FUNDAMENTALS OF ENGINEERING EXAMINATION

To become legally registered as a professional engineer (P.E.), candidates must submit data regarding formal education and technical ability to the appropriate state Board of Registration for Professional Engineers. Two major examinations, The Fundamentals of Engineering Examination (also called Engineering-in-Training, E.I.T.) and the Professional Practice Examination (P.P.E.), must be successfully completed as a measure of technical ability. The Fundamentals Examination must be taken first; the Professional Practice Examination must then be taken after a designated period of substantial professional experience, usually a minimum of four years. File applications for E.I.T. by January 1. The E.I.T. Examination will be given in mid-April and late-October. File applications for Professional Practice Examinations (P.P.E.) six months in advance.

There are several possible qualification paths to registration as a P.E. The quickest and most common route is to obtain a degree from an ABET (Accreditation Board for Engineering and Technology—formerly ECPD) accredited curriculum, and to acquire the specified amount of suitable professional level experience in addition to pass-

ing the two examinations mentioned above. There are seven ABET accredited curricula at WPI—biomedical engineering, civil engineering, chemical engineering, electrical and computer engineering, manufacturing engineering, industrial engineering, and mechanical engineering. Persons with an unaccredited degree can still become registered in most, but not all, states by submitting evidence of a longer “apprenticeship” period (variable by states) before taking the two examinations. Students should strive, if at all possible, to pursue a program which is accredited by ABET and should work closely with their advisors and appropriate major departments to assure that the total program qualifies for accreditation, since this will greatly facilitate the achievement of registration in the future.

ALL SENIOR ENGINEERING MAJORS IN BME, CE, CHE, ECE, ME AND MFE ARE URGED TO TAKE THE FUNDAMENTALS OF ENGINEERING EXAMINATION WHICH IS GIVEN ON CAMPUS EACH FALL AND SPRING. There will never be a better time!

Refresher courses for students, alumni and practicing engineers are available. Successful completion of this examination is normally the first step in eventually obtaining the right to use the initials “P.E.”

WPI’s Office of Continuing Education sponsors an eleven session EIT Refresher course from mid-January through mid-April on the WPI Campus. The course, which is taught by WPI faculty, includes reviews of the major topics covered on the exam. For further information, call 508-831-5517.

DESCRIPTION OF FUNDAMENTALS OF ENGINEERING EXAMINATION (F.E.E.)

Typical Date Given: Last Saturday in October (also in April).

Typical Application Deadline: First week in September (also in January).

Duration: Eight hours.

Type: Multiple choice, open book.

Sample Questions: A set of typical questions asked on the Fundamentals of Engineering Examination may be obtained by applicants from the reserve section of Gordon Library.