# The WPI Plan

## Section 1

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The Mathematics and Science Requirement defines a standard of scientific, technological, engineering, and mathematical literacy for graduates of WPI, regardless of major field. Most degree programs will provide a substantial level of preparation in most of these areas, far beyond this standard. Students will satisfy this requirement by satisfying the program requirements of their individual major programs.

The goals of the Mathematics and Science Requirement at WPI are that students will be able, in their careers and daily lives, to: 1) explain and apply key concepts and principles of scientific disciplines and use an understanding of scientific methods to make critical judgments, 2) apply mathematical methods to understand the solution of real-world problems, 3) productively and appropriately use computers and other technology, 4) use methods from the quantitative, natural, or engineering sciences to systematically identify, formulate, and solve problems.

The specific requirement is two units of work in science, engineering, mathematical science, or computer science. Two-thirds of units of work must be in Quantitative Science (courses with prefixes CS or MA count by default); two-thirds of units of work must be in Natural or Engineering Science (courses with prefixes BB, BME, CHE, CE, CH, ECE, ES, GE, ME, PH or RBE count by default); the final two-thirds unit may be from any of the Quantitative, Natural or Engineering Sciences. Each major program may set more restrictive requirements as the program sees fit. Programs may also propose other work to fulfill any portion of the two-unit Requirement; such alternatives must be approved by the Committee on Academic Policy and the Dean of Undergraduate Studies.

3. The Interactive Qualifying Project (See page 17)
Successful completion of a qualifying project relating science and/or technology to society (the Interactive Qualifying Project, or IQP) representing at least one unit of credit in project or independent study work. The format of the documentation is to be in accordance with current WPI policy on such documentation.

4. The Major Qualifying Project (See page 16)
Successful completion of a qualifying project in the major area of study (the Major Qualifying Project, or MQP) representing at least one unit of credit in project or independent study work. The format of the documentation is to be in accordance with current WPI policy on such documentation.

5. Distribution Requirements (See program description for specified departments — page 40)
Satisfaction of published academic activity distribution requirements in or relating to the major area of study. These requirements typically total no more than ten units (including the MQP and two units to fulfill the Mathematics and Science Requirement) and are specified by general topical subject area, not by specific courses. Completion of distribution requirements will be certified by the appropriate Program Review Committee (PRC), upon recommendation by the student's academic advisor. For students desiring designation of a major area for which a determination regarding distribution requirements has not previously been made and published, a faculty committee will be appointed by the department head or IGSD dean to review and approve the student’s program of study.
6. **Social Sciences** (See page 38)
   Completion of 2/3 unit of work in the social sciences, exclusive of qualifying project.

7. **Residency Requirement**
   A minimum of eight units **must** be completed satisfactorily in residence at WPI. (It is anticipated the normal residence at WPI will be 16 terms.)

8. **Minimum Academic Credit**
   The minimum academic credit required for the Bachelor degree is 15 units. Credit accumulated beyond the published distribution requirements shall be accomplished by the addition of “free elective” work.

9. **Physical Education** (See page 107)
   Qualification in physical education shall be established by completing 1/3 unit of course work (four PE classes) or its equivalent. Such an equivalent, for example, may be participation in club or varsity sports.

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**MAJOR AREAS OF STUDY**

Guidelines for the construction of the most common major programs are given alphabetically by area in the “Department and Program Descriptions” section beginning on page 40. The exact program of study for any student, however, is developed by the student with the aid of an advisor.

All of the majors below, with the exception of Environmental and Sustainability Studies, and Liberal Arts and Engineering, are awarded with the B.S. degree. Some programs are listed that are developed through the departments indicated in parentheses. In the past, WPI has graduated students in the following fields, but this list should not be interpreted as necessarily putting any restriction on a student’s “major”:

- Actuarial Mathematics (MAC)
- Aerospace Engineering (ME) (accredited by ABET)
- Applied Physics (PHA)
- Architectural Engineering (AREN)
- Biochemistry (CBC) (certified by the American Chemical Society)
- Bioinformatics and Computational Biology (BCB)
- Biology/Biotechnology (BB)
- Biomedical Engineering (BME) (accredited by ABET)
  Specializations in:
  - Biomaterials and Tissue Engineering
  - Biomechanics
  - Biomedical Instrumentation, Biosignals, and Image Processing
- Chemical Engineering (CHÉ) (accredited by ABET)
  Concentrations in:
  - Biochemical
  - Biomedical
  - Environmental
  - Materials
- Chemistry (CBC) (certified by the American Chemical Society)
  Concentration in:
  - Medicinal Chemistry
- Civil Engineering (CEE) (accredited by ABET)
  Subareas in:
  - Structural and Geotechnical Engineering
  - Environmental Engineering
  - Transportation Engineering
  - Urban and Environmental Planning
  - Construction Engineering and Project Management
  Concentration in:
  - Environmental

- Computer Science (CS)
- Economic Science (SSPS)
  Concentrations in:
  - Sustainable Economic Development
  - Computational Economics
- Electrical and Computer Engineering (ECE) (accredited by ABET)
  Subdisciplines in:
  - Robotics
  - Power Systems Engineering
  - RF Circuits and Microwaves
  - Communications and Signal Analysis
  - Biomedical Engineering
  - Analog Microelectronics
  - Computer Engineering
- Environmental Engineering (CEE; CHE) (accredited by ABET)
- Environmental and Sustainability Studies (B.A. degree) (ID)
- Humanities and Arts (HU)
  Concentrations in:
  - American Studies
  - Environmental Studies
  - Humanities Studies of Science and Technology
  - History
  - Literature
  - Music
  - Philosophy, Religion
  - Drama/Theatre
  - Writing and Rhetoric
  - Art History
  - German Studies
  - Hispanic Studies
  - Science and Technology
- Industrial Engineering (BUS) (accredited by ABET)
- Interactive Media & Game Development (HU; CS)
  - Artistic Track
  - Technical Track
- Interdisciplinary (by arrangement) (IGSD)
- International and Global Studies (HU)
- Liberal Arts and Engineering (B.A. degree) (HU)
- Management (BUS) (accredited by AACSB)
Management Engineering (BUS)(accredited by AACSB)  
Concentrations in:  
- Biomedical Engineering  
- Chemistry  
- Civil Engineering  
- Electrical and Computer Engineering  
- Mechanical Engineering  
- Manufacturing Engineering  
- Operations Management  
Management Information Systems (BUS)(accredited by AACSB)  
Mathematical Sciences (MA)  
Subareas in:  
- Algebraic and Discrete Mathematics  
- Computational and Applied Analysis  
- Operations Research  
- Probability and Statistics  
Mechanical Engineering (ME)(accredited by ABET)  
Concentrations in:  
- Biomechanical  
- Engineering Mechanics  
- Manufacturing  
- Materials Science and Engineering  
- Mechanical Design  
- Robotics  
- Thermal-Fluid Engineering  
Physics (PH)  
Professional Writing (IGSD)  
Psychological Science (SSPS)  
Robotics Engineering (CS; ECE; ME)(accredited by ABET)  
Society, Technology and Policy (SSPS)  
System Dynamics (SSPS)  

Programs for students interested in medicine, law or pre-college education can be readily developed from many of the above majors.  
Interdisciplinary (individually-designed) majors (ID) may also be developed under the B.S. or B.A. degree; see Interdisciplinary Programs, page 90.  
WPI undergraduate diplomas designate “Bachelor of Science” or “Bachelor of Arts” as appropriate. The transcript will list the student’s major. If a Minor or Concentration was completed, this will also be included on the transcript.  
The number of majors associated with a single WPI Bachelor’s degree is limited to two.

PROFESSIONALLY ACCREDITED PROGRAMS

WPI is accredited as an institution by the New England Association of Schools and Colleges. In addition, the aerospace engineering, biomedical engineering, chemical engineering, civil engineering, electrical and computer engineering, environmental engineering, industrial engineering, mechanical engineering, and robotics engineering programs are accredited by the Engineering (or Computing) Accreditation Commission of ABET, http://www.abet.org. The Chemistry and Biochemistry Department and its program are approved by the American Chemical Society. The bachelor’s and master’s degree programs offered by the Robert A. Foisie School of Business are accredited by AACSB International — The Association to Advance Collegiate Schools of Business.
WPI’s advising program is based on a cooperative and understanding relationship between the students and advisors. Under the WPI Plan, students have the final responsibility for designing their own educational experience at WPI which includes understanding all their degree requirements and making sure all those requirements have been satisfied for graduation. The role of the faculty advisor is to help his/her advisees design a program of study which reflects the students’ interests and professional goals. While advisors are willing to suggest specific programs of study, they will not insist that students follow a particular path. Advisors also help students choose among academic alternatives, help them interpret catalog requirements and review degree audits and grade reports with them. Students are expected to understand these documents and their implications for academic progress and act accordingly. Therefore it is critical that students take the initiative to consult regularly with their academic advisors.

The Office of Academic Advising at WPI has three main areas of focus: 1) general academic advising; 2) academic resources; and 3) pre-health programs.

GENERAL ACADEMIC ADVISING
Students can come to the Office of Academic Advising to get general advising help in areas such as course selection, academic status concerns, major and advisor selection, and individualized academic coaching. The Office of Academic Advising oversees programming for the First Year, including the Insight Program and the Insight Wellness course.

The academic coaching program includes counseling from an Academic Advisor (or PAC - Peer Academic Coach) in areas such as learning styles, effective study strategies, problem solving and critical thinking skills, and time management. Students work on setting their academic goals, discovering their strengths and weaknesses, and designing learning and study strategies that work best for them.

ACADEMIC RESOURCES CENTER
The Academic Resources Center (ARC) at WPI is located in Daniels Hall, and houses the academic tutoring program, MASH (Math and Science Help) and the Peer Academic Coaching program. Peer tutors and academic coaches are students who have demonstrated a mastery of material, and have been trained in peer tutoring and communication.

The MASH program is an academic support program for students enrolled in math and science classes. Offered to all students in a supported course, MASH provides assistance in regularly scheduled weekly study sessions beginning the first week of every term.

MASH review sessions are offered for a limited number of courses which students and faculty have identified as challenging. Many of the courses are typical first year classes, allowing extra support for students transitioning to college-level work. Each session is guided by a MASH leader, an undergraduate student who has taken the course before and has excelled. He/she understands the course material and what the instructor expects. MASH leaders attend lectures so they are prepared for questions that might arise in a MASH session.

Through the MASH, tutoring, and PAC program, students become actively involved with the content material in a supportive environment. Studies show that students who attend MASH, tutoring, and see a PAC regularly earn higher grades than students electing not to participate. But even more importantly, they learn how to master new concepts, learn how to put ideas into perspective, develop a better way to study, and effectively manage their time.

PRE-HEALTH ADVISING
The Pre-Health Advisor works with students who are interested in pursuing careers in the health professions. Students may meet with the Pre-Health Advisor to a) explore various careers in health care and receive assistance in selecting the most suitable path for themselves; b) receive advice regarding pre-requisite courses and other preparation for various health professions programs (e.g. medicine, dentistry, veterinary medicine, optometry, physician assistant studies, physical therapy, among others; c) receive assistance throughout the professional school application process, including the arrangement of a committee recommendation letter; d) take advantage of academic coaching or receive general help. The Office of Academic Advising collaborates with the Career Development Center and other offices on campus to offer special programming for pre-health students. Students may make an appointment for any of these services by contacting the Office of Academic Advising at 508-831-5381.

OFFICE OF DISABILITY SERVICES
Academic accommodations are available for students with documented disabilities. Please see page 212 for more information.
### Concentrations

#### Definition
A Concentration is an option associated with a Major which provides recognition for focused and coordinated academic work either within the Major or within an area of study closely related to the Major.

#### Rules
1. All Concentrations require completion of two units of integrated academic study plus an MQP with a topic and content appropriate to the given Concentration.
2. Concentrations deemed to belong exclusively or primarily within the stated Major must be accommodated within the distribution requirements of that Major.
3. Concentrations deemed to have a substantial interdisciplinary nature can exceed the normal 10-unit allotment of the Major by as much as 1 unit, provided that the additional requirements do not include or permit academic work designated by the Major prefix or coursework normally taken to satisfy the Major's portion of the distribution requirements. Furthermore, Concentrations of an interdisciplinary nature are permitted to use up to 1 unit of the academic program beyond the distribution requirements of the Major, including the IQP, Social Science requirement, and Free Electives, as deemed appropriate.
4. The requirements of the Concentration must be designed to offer choices for the student within the Major area and, if relevant, outside the distribution requirements of the Major; however, the Concentration requirements must not preclude meeting the normal distribution requirements for the Major.
5. Rules and guidelines for each Concentration will be formulated by the faculty associated with the governing Major, and must be reviewed by the Committee on Academic Operations (CAO) and subsequently approved by the Faculty. CAO is empowered to rule on whether a proposed Concentration is disciplinary or interdisciplinary.
6. An individual program of study leading to a Major with a Concentration will be planned by a student in consultation with his/her academic advisor. The student's intention to pursue a Concentration will be declared by application to the appropriate Program Review Committee in accordance with that Committee's schedule of deadlines. Application deadlines should be designed to enable Committee review and communication of decisions to students at a sufficiently early point that flexibility of schedule still exists. Extenuating circumstances may be considered at the discretion of the Program Review Committee.
7. Concentrations and minors are additional degree designations. Any credit earned for an additional degree designation must not overlap with credit earned for another additional degree designation by more than one unit. Also, no credit-bearing activity may be triple-counted towards degree designations or degree requirements.

Listings of Concentrations may be found in the “Department and Program Descriptions” section beginning on page 39.

### Minors

#### Definition
A Minor is a thematically-related set of academic activities leading to a degree designation in addition to but separate from that granted by the Major. A Minor should be available to students of any Major, with the exception of a Minor which overlaps with a Major area to such an extent that it is not sufficiently distinct from that Major. The Committee on Academic Operations (CAO) is responsible for the review of proposed Minor Programs and decisions regarding allowed Major/Minor combinations.

#### Rules
1. A Minor requires completion of two or more units of thematically related activity. Individual departments may impose additional restrictions such as a capstone or integrative experience. Students should consult individual Minor Program descriptions in Section 2 of this catalog for these restrictions.
2. It is expected that Minor requirements will be structured so that all acceptable Major/Minor combinations can be accommodated within a normal 16 term framework.
3. A Minor may include any portion of the academic program, excluding the MQP. Academic activities used in satisfying the regular degree requirements may be double-counted toward meeting all but one unit of the Minor requirements, subject to the following restrictions:
   a. The one unit of double-counted work may include at most 1/3 unit of the IQP, 3/3 units of the Humanities and Arts Requirement, or a combination thereof.
   b. At least one unit of the Minor must be free elective choices. For the social science exception see page 119.
4. The Program Review Committee for a Minor area will consist of faculty members designated by the sponsoring faculty members.
5. A Minor area must be proposed by a sponsoring group of faculty and must be defined by the purpose of achieving an educational goal beyond those apparent or implicit in the regular degree requirements. Student-initiated Minor Programs must be developed with the approval of a sponsoring group of faculty advisors. Each Minor Program must be reviewed by CAO for its individual merit.
6. Minors are additional degree designations. Any credit earned for an additional degree designation must not overlap with credit earned for another additional degree designation by more than one unit. Also, no credit-bearing activity may be triple-counted towards degree designations or degree requirements.
Minors are described in the “Program Description” section of this catalog. Minors sponsored by a department are described following the department. Others are listed alphabetically by title. As of the printing of this catalog, the following Minors have been approved:

- Astrophysics
- Biology
- Biochemistry
- Bioinformatics and Computational Biology
- Business
- Chemistry
- Chinese Studies
- Computer Science
- Drama/Theatre
- Economics
- Electrical and Computer Engineering
- English
- Entrepreneurship
- Environmental and Sustainable Studies
- German
- History
- Industrial Engineering
- Interactive Media & Game Development
- International and Global Studies
- Law and Technology
- Management Information Systems
- Manufacturing Engineering
- Materials
- Mathematics
- Mechanical Engineering
- Media Arts
- Music
- Nanoscience
- Philosophy and Religion
- Physics
- Political Science and Law
- Psychology
- Robotics Engineering
- Social Entrepreneurship
- Social Science
- Sociology
- Spanish
- System Dynamics
- Statistics
- Writing.

Interdisciplinary or Individually Designed (ID) minors are approved by the Committee on Academic Operations (CAO). The form needed to declare a minor or to propose an interdisciplinary or individually designed minor can be found in the Registrar’s Office.

### DOUBLE MAJORS

An option for some students who wish to broaden their WPI experience is the completion of two distinct majors through the double major option. The choice to pursue a double major should be made early in a student’s career. No student shall complete more than two undergraduate majors.

For double majors, the diploma may list both majors (in order of preference by the student), either major, or no major as indicated by the student.

A double major should signify capacity in two distinct disciplines. Some combinations of double majors are not sufficiently distinct to merit this designation. Departments and programs decide whether any combinations of double majors overlap to such an extent as to be disallowed. As of the publication date of this catalog, the following combinations are not allowed:

- Actuarial Mathematics and Mathematics
- Aerospace Engineering and Mechanical Engineering
- Biochemistry and Chemistry
- Civil Engineering and Architectural Engineering
- Civil Engineering and Environmental Engineering
- Computer Science and Computers with Applications
- Humanities and Arts and International and Global Studies
- Industrial Engineering and Management Engineering with Concentration in Operations Management
- Physics and Applied Physics

Students who wish to pursue any double major should consult with faculty advisors in both majors. Exceptions to disallowed double majors must be approved by the Committee on Academic Operations.

Degree requirements for double majors are as follows:

1. **The Humanities and Arts Requirement.**
   No modifications are made to the Humanities and Arts Requirement for double majors. All students, including majors in Humanities and Arts or International and Global Studies must satisfactorily complete the Humanities and Arts Requirement culminating in an Inquiry Seminar or Practicum.

2. **The Interactive Qualifying Project.**
   If one of the majors of a double major is in Social Science and Policy Studies, a single project bearing at least one unit credit may be used to satisfy both the MQP requirement for the SSPS major and the IQP requirement. In order to be used to satisfy both requirements, the combined social science MQP and IQP must meet the goals of both projects. It must be interactive in nature involving an aspect of technology, and must also be an application of social science knowledge and analytical techniques. In order to select a single project that satisfies both the goals of the MQP and the goals of the IQP, the decision to pursue a social science double major needs to be made fairly early in the student’s career.

3. **The Major Qualifying Project.**
   At least one separate and distinct major qualifying project of at least one unit of work must be completed for each major, unless a student receives permission from his/her MQP advisor to pursue a single interdisciplinary MQP of at least 4/3 units of credit (See the Major Qualifying Project.)

4. **Distribution Requirements.**
   The distribution requirements of each major must be met, but requirements common to both majors have to be met only once. The MQP requirements for Double Majors may be fulfilled in either one of two ways:
   - Two distinct projects, one in each major, each of at least one unit of credit.
   - One interdisciplinary project of at least 4/3 units of credit, and having significant work associated with each major. An interdisciplinary project must be:
     - jointly advised by at least two faculty members, one associated with each of the relevant degree programs; OR
     - advised by a single faculty member who is associated with both of the relevant degree programs.
Faculty associated with each degree program are listed in Section 2 of the WPI Undergraduate Catalog.

An interdisciplinary MQP involving social science may not be used as an IQP.

The interdisciplinary MQP option takes advantage of the value of interdisciplinary work at the intersection of the two majors. Students undertaking an interdisciplinary MQP must complete an interdisciplinary MQP approval form in advance of project registration, and this form must be signed by all advisor(s) on the project. This form must contain a summary of the proposed project work indicating the content relating to each major. The interdisciplinary MQP option is available only at the discretion of the faculty and only when all faculty advisor(s) agree on the project content. Students planning to use this option should identify and consult with their faculty advisor(s) well before the end of their junior year.

For a double major, completion of a 4/3 unit interdisciplinary MQP completes the 1 unit MQP requirement for each major. The assignment of credit is as follows: 2/3 unit is double counted toward each major, and the remaining 2/3 unit is allocated as 1/3 unit to one major and 1/3 unit to the other major.

Note: It is anticipated that in some cases a student pursuing a double major will join a project team whose other members are pursuing a single major. The double-majoring student will bring the interdisciplinary content to the project, and this additional work will be represented by the additional credit that that student (perhaps only that student) earns, and with an enlarged report prepared by that student.

For students wishing to pursue double majors, the program audit for each intended major must be completed and certified by the review committee of each department involved. Academic activities appropriate to both majors may be counted in both majors. For the policy in the special situation of double majors involving the social sciences see the Social Science and Policy Studies department description in Section 2 and the Double Major Distribution Requirements in Section 4 of the Undergraduate Catalog.

Certain interdisciplinary MQP’s and corresponding double-majors in the same department are not allowed.

Interdisciplinary MQP’s with two faculty advisors: All faculty advisors have equal status in approving the final project, and a single grade is submitted for each term’s work and a single project grade is submitted on the CDR form. Should an interdisciplinary MQP, once completed, be deemed acceptable as an MQP for one of the two majors, but not for the other, and/or if the faculty advisors cannot agree on a single grade after much effort to do so, the project may be considered as the MQP for a single major. This conversion can only occur with the consent of the student and the advisor(s) from the single major being selected.
Project activity is an integral part of the educational experience for all students under the WPI Plan. The two types of qualifying projects are:

1. A project in the major field of study (the Major Qualifying Project, or MQP).

2. A project which relates technology and science to society or human needs (the Interactive Qualifying Project, or IQP).

Projects should be chosen in consultation with the student’s academic advisor and must be accepted by a project advisor before project registration can be completed. Many project opportunities come from off-campus organizations, and provide challenges to solve real-world problems and thus gain experience invaluable for seeking jobs and for professional practice.

Students are encouraged to develop their own projects, to solicit support for their ideas from potentially interested faculty, and to form teams to pool resources and share points of view.

The Major Qualifying Project should focus on the synthesis of all previous study to solve problems or perform tasks in the major field with confidence, and communicate the results effectively.

The Interactive Qualifying Project should challenge students to relate social needs or concerns to specific issues raised by technological developments.

RESOURCES - GETTING STARTED
Students are encouraged to avail themselves of the many resources and advice areas found in the Projects Program web page (projects.wpi.edu).

In addition, personal advice can be provided by meeting with the project coordinators listed on page 206.

AVAILABLE PROJECTS
Students may obtain information about new or ongoing projects from a variety of sources. Principal sources include discussions with other students, especially those currently involved in a project, the Projects Program web site, department offices, or their web pages. Off-campus projects are discussed annually in the fall. In the spring, “Available Projects” on the Projects Program web site (www.wpi.edu/Academics/Projects/) can be used as a directory of specific IQP projects or as a source of ideas for developing your own projects. Some students will find a project listed which fits their needs and interests exactly. In other cases, the listing will serve to lead students to a faculty member with whom project involvement can be negotiated. The proposals in the Projects Program web page are updated periodically to provide an accurate listing of available projects.

Students are encouraged to check the web site of the department of their major for MQP opportunities, as well as consult with their academic advisor.

PROJECT ADVISOR
Academic advisors can assist students in identifying a project. They are aware of the project interests of many other faculty members, and have a list of faculty interests which will enable a student to find a faculty member who can help to develop a project idea. Faculty associated with the Interdisciplinary and Global Studies Division (IGSD) are available to assist students in interdisciplinary and interactive projects.

PROJECT PERFORMANCE AND TIME-ON-TASK
A student is normally expected to expend 15-17 hours per week on the average for each 1/3 unit of credit for project work, and expected achievement is based upon that commitment.

A project group, whether it involves one student or more, should have a minimum of one scheduled conference per week with the advisor(s). Additional time should be scheduled when the effort exceeds 1/3 unit per student or when more students are involved.

Students should be prepared to submit interim project reports to the advisor each week. Students are also encouraged to complete a proposal at the beginning of the project activity to define the scope and timeline for completion of the effort. In addition, oral reports may be required as determined by the advisor. At the end of the project, a report must be prepared to the satisfaction of the project advisor. For projects sponsored by off-campus organizations, both a written and oral report for the sponsors is normally expected.

QUALIFYING PROJECT GRADING
The Faculty of WPI has endorsed the following grading guidelines for qualifying project activity:

1. Each term a student is registered for a qualifying project, the student receives a term grade reflecting assessment of his or her accomplishments for that term.

2. Upon completion of a project, each student will receive an overall project grade (also known as the “CDR grade,” since it certifies completion of the degree requirement) reflecting his or her individual overall accomplishments for the project.

3. The term grades and the overall project grade reflect both the products of the project (e.g., results, reports, etc.) and also the process by which they were attained. The term grades and the overall project grade may be different.

The following are some characteristics that faculty should use in communicating expectations and evaluating the quality of each student’s project work.

The degree to which the student:

• developed effective or creative goals or approaches,
• demonstrated initiative and originality,
• showed depth and critical thought in analysis,
• produced high quality results,
• took the lead in discussion, planning, and analysis,
• produced a clear, professional-level report with excellent drafts along the way,
• anticipated work that needed to be done and completed it in a timely manner, and
• worked to advance the success of the team.

For both terms and overall project, the available grades and interpretations are:

A: This grade denotes excellent work that attains all of the project goals and learning outcomes. The product and process of this work meet all of the expectations and exceed them in several areas.

B: This grade denotes consistently good work that attains the project goals and learning outcomes. The product and process of this work meet but generally do not exceed all of the expectations.

C: This grade denotes acceptable work that partially attains project goals and learning outcomes. The product and process of this work meet some but not all expectations.
SP: This grade denotes satisfactory progress and certifies sufficient accomplishments to earn credit for that term. Faculty who assign this grade should provide clear feedback to the student regarding his or her progress during the term. The use of the SP grade is discouraged except in circumstances where the faculty member is unable to judge the quality of the work, yet can attest that the granting of credit is appropriate. This is a temporary grade and must be replaced by a permanent grade consistent with the criteria outlined above by, if not before, the end of the project.

NR: This grade denotes work that did not attain the project goals or learning outcomes and is insufficient for registered credit. Both product and process were inconsistent with acceptable project work at WPI as outlined above.

NAC: This grade is reserved for performance that is unacceptable. It might mean that a student's performance (or lack of it) has seriously impeded group progress, or it has embarrassed the group, a project sponsor, or WPI. Note that this grade remains on the transcript.

4. Project goals should be established and clearly articulated early in the project. This may be done in the form of a formal project proposal. Learning outcomes for the qualifying projects have been established by the faculty and are published in the undergraduate catalog.

5. Project advisors should clearly convey their expectations for learning and performance to project students at the start of the project, and provide students with substantive feedback on a regular basis during the project.

ELECTRONIC PROJECT SUBMISSION

WPI requires that all undergraduate students submit their Interactive Qualifying Project (IQP) and Major Qualifying Project (MQP) electronically (“eProjects”).

Students must be registered for a minimum of 1/6 unit of qualifying project credit in the term in which the final project report is submitted. An eProject must be submitted via the web site, wpi.edu/+eprojects, following the steps outlined there.

No matter which format is used to create the original report document (Microsoft Word, Latex, or other), the final report must be converted to a PDF format in order to be submitted as an eProject. For information on converting to a PDF, go to wpi.edu/+ATC/Collaboratory/HowTo/. Every eProject must include a title page and must follow the formatting guidelines described at wpi.edu/+Projects/finishing.html.

The deadline for the submission of the initial report draft and the final document may be established at the discretion of the project advisor. Drafts and reports need not be accepted by the advisor after the established deadline.

The final PDF is required, but additional related files such as simulations, computer programs, multimedia, and data sets may be submitted as a component of the project.

A project that is completed by a team of students, except in extenuating circumstances, will submit ONE project report from the group. After the MQP or IQP team submits the final version of the project report, the advisor must review the work and approve or reject it online at wpi.edu/+eproject.

The final project report should be carefully proofread. Once the submitted project has been approved by the advisor and released for archiving by the Registrar’s Office, it is considered an academic record and cannot be edited.

A completed electronic Completion-of-Degree-Requirement (eCDR) form, must be printed for signature by each student and signed individually by the advisor as the final step in the submission process. The eCDR form must be submitted in person by the project advisor or a member of the academic department of the advisor to the Office of the Registrar by no later than the tenth day of the next academic term.

A student who has filed an application to receive their degree in May must submit a completed eCDR to the Office of the Registrar by the last Thursday in D-term.

GROUP QUALIFYING PROJECT EFFORTS

Students meeting a qualifying project degree requirement by participation in a group, or team effort, will submit, at the discretion of the project advisor, either a single, comprehensive written report from the group, or individual written reports from each member of the group. A single, comprehensive written report must, however, include some means by which each individual’s contribution to the group effort may be clearly identified. This identification may take the form of an “authorship page,” simply a list of individual chapters and their respective authors, or of a prefacing statement in which each contributing group member is named as having carried out one or more specific tasks within the overall project effort.

In the case where one or more students leave an ongoing group project after having contributed at least one unit each of project effort, those students, again at the discretion of the project advisor, will submit either a single written report or individual written reports in satisfying the qualifying project documentation requirement. The same means of identifying individual contributions will be employed as described above.

DISSEMINATION OF PROJECT REPORTS

MQPs and IQPs completed for off-campus agencies are usually distributed within the sponsoring agency by the agency project liaison. A project report may be restricted from public viewing if it contains confidential or proprietary information of a sponsoring agency. Completed project reports are electronically archived at WPI’s Gordon Library, are indexed and are available to the public (http://www.wpi.edu/+library).

Students are responsible for keeping personal copies of project reports for their own permanent professional records. In this way, reports can be reviewed for later use, and incorporated into a professional portfolio.

Thus, MQPs and IQPs are best viewed as research reports which establish good professional practices as well as being potential sources for further study and research.

PAY AND CREDIT (for students working on sponsored projects)

A student may receive pay for work associated with a registered project under the following conditions:

1. The work done for pay is clearly distinguished from the work defined for academic credit for the project. This distinction must be clearly articulated in a conflict of interest statement signed by all participating parties before the project begins.

2. Results obtained from paid or unpaid work performed while students are not registered for project credit at WPI may be used in projects only after consultation with the project advisor. When possible, such consultation should take place before work begins.
The qualifying project in the major field of study should demonstrate application of the skills, methods, and knowledge of the discipline to the solution of a problem that would be representative of the type to be encountered in one’s career. The project’s content area should be carefully selected to complement the student’s total educational program. In defining the project area within which a specific topic is to be selected, the student and academic advisor should pay particular attention to the interrelationships that will exist between the bodies of knowledge represented by courses, independent studies, and Preliminary Qualifying Projects; and by the Interactive Qualifying Projects.

MQP activities encompass research, development, and application, involve analysis or synthesis, are experimental or theoretical, emphasize a particular subarea of the major, or combine aspects of several subareas. In many cases, especially in engineering, MQP’s involve capstone design activity. Long before final selection of a project topic, serious thought should be given as to which of these types of activities are to be included. Beyond these considerations, the MQP can also be viewed as an opportunity to publish or to gain experience in the business or public sectors.

Off-campus MQPs are also very valuable for access to state-of-the-art resources and contacts for future professional work.

GETTING STARTED ON AN MQP
Project topics are originated by students, faculty, or practicing professionals participating in WPI’s off-campus project programs. A faculty member in each academic department acts as Project Coordinator for all majors within the department. The Project Coordinator has assembled MQP topic descriptions being proposed and has identified the faculty who will serve as project advisors for each topic. All project opportunities-MQP, IQP, PQP, on-campus originated and off-campus originated are made available to the student body through a planned information-sharing program of activities during C and D terms of the academic year prior to the start of the project.

PROJECT PROPOSALS
Students are strongly encouraged to begin their MQPs with a project proposal. A detailed guide to preparing project proposals is available in department offices or on the Projects Program web page (www.wpi.edu/academics/Projects/).

MQP LEARNING OUTCOMES
By completing their MQP, WPI students will achieve the following learning outcomes at a level at least equivalent to that of an entry level professional or graduate student.

1. apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study.
2. demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study.
3. use effectively oral, written and visual communication.
4. identify, analyze, and solve problems creatively through sustained critical investigation.
5. integrate information from multiple sources.
6. demonstrate an awareness and application of appropriate personal, societal, and professional ethical standards.
7. practice the skills, diligence, and commitment to excellence needed to engage in lifelong learning.

Specific disciplinary programs may add additional MQP outcomes, such as design or mathematical skills or teamwork, as appropriate.

MQP PROJECT CENTERS
Each project center has a WPI faculty member as the director, well-defined procedures for completing project work, and selective admissions processes. The Centers tend to be highly structured and require superior performance.

At the present time, the WPI project center close to campus is:
• University of Massachusetts Medical School Project Center/Tufts University Cummings School of Veterinary Medicine.

See also page 19 for residential Project Centers at a distance from WPI.

UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL PROJECT CENTER/ TUFTS UNIVERSITY CUMMINGS SCHOOL OF VETERINARY MEDICINE
Major qualifying projects are available at nearby University of Massachusetts Medical School (UMMS) and Tufts University Cummings School of Veterinary Medicine (TUCSVM) for students from many disciplines on campus. These institutions are nationally recognized for research and medicine and offer project opportunities over a wide range of research areas.

Students performing projects at these centers work in cutting edge research programs and typically interact with graduate and post-doctoral researchers to solve real-world problems.

It is recommended that students spread their projects over the entire academic year. Students from any major interested in project opportunities should contact Dr. Destin Heilman in the department of Chemistry and Biochemistry.
At WPI, students are expected to develop an understanding of how science and technology are embedded in the fabric of society. The Interactive Qualifying Project (IQP) challenges students to address a problem that lies at the intersection of science or technology with society. During the IQP, students work in interdisciplinary teams, often with an external sponsoring organization, to develop solutions to real world problems. In doing so, students learn something about the role of science and technology, its impact on society, its place in meeting human needs and human efforts to regulate, control, promote and manage our changing technologies. The IQP is equivalent to three courses, typically undertaken in a student's junior year. It can be completed over three terms, or as a full course load for a student for one term, and it can be completed on-campus, or at one of our many residential project centers in the U.S. and abroad. For more on the IQP see the websites of the Interdisciplinary and Global Studies Division (IGSD) at http://www.wpi.edu/academics/igsd/iqp.html. For more on the IQP and study abroad, see the Global Perspective Program website: http://www.wpi.edu/academics/igsd/gpp.html. Completed IQPs are electronically archived at WPI's Gordon Library, are indexed and are available to the public (http://www.wpi.edu/+library).

IQP LEARNING OUTCOMES
The Faculty adopted the following statement defining learning outcomes for the IQP. Successful completion of an IQP is an important element in helping students achieve WPI’s overall undergraduate learning outcomes.

Students who complete an Interactive Qualifying Project will:
1. Demonstrate an understanding of the project's technical, social and humanistic context.
2. Define clear, achievable goals and objectives for the project.
3. Critically identify, utilize, and properly cite information sources, and integrate information from multiple sources to identify appropriate approaches to addressing the project goals.
4. Select and implement a sound methodology for solving an interdisciplinary problem.
5. Analyze and synthesize results from social, ethical, humanistic, technical or other perspectives, as appropriate.
6. Maintain effective working relationships within the project team and with the project advisor(s), recognizing and resolving problems that may arise.
7. Demonstrate the ability to write clearly, critically and persuasively.
8. Demonstrate strong oral communication skills, using appropriate, effective visual aids.
9. Demonstrate an awareness of the ethical dimensions of their project work.

PREPARING FOR AND FINDING AN IQP
Students are encouraged to view the IQP as a learning opportunity – a chance to gain knowledge outside their major field – while working with others to solve open-ended, complex problems. The best approach is to consult with one's academic advisor and select courses to be taken in the first and second year at WPI that can provide a foundation for an IQP in the junior year. Often project preparation involves developing an understanding of the social sciences and humanities, as the concepts and analytical techniques of these disciplines are important in understanding the social context of science and technology. In addition, students enrolled in the Global Perspective Program will be expected to complete a course devoted to project preparation in advance of their travel. Project topics originate with external organizations, faculty and students. Students who complete IQPs at a residential project center through the Global Perspective Program work on project topics identified by external sponsoring organizations. Students can explore these opportunities at the Global Opportunities Fair organized each September by the Interdisciplinary and Global Studies Division (IGSD). Students completing projects on campus are encouraged to seek faculty members that share their interests to advise projects. Faculty interested in advising specific IQPs will post their project topics on-line at the IQP Registry. See http://www.wpi.edu/Academics/Projects/available.html. The IGSD also hosts an On-Campus Project Opportunities Fair each March where students can meet faculty advisors to discuss projects being offered on campus during the following year. The IGSD (http://www.wpi.edu/academics/igsd.html) offers administrative support for project activities. Students are welcome to seek further assistance from the staff on the second floor of the Project Center.

WHAT ARE IQPS ABOUT? SCIENCE, TECHNOLOGY AND SOCIETY
Most, but not all, IQPs are indexed according to the following IQP Divisions. These Divisions assist students in locating proposed projects by topical area in the Registry of IQP opportunities (http://www.wpi.edu/Academics/Projects/available.html). IQP (and MQP) projects are searchable in the Library’s catalog (http://www.wpi.edu/+library).

Division 41: Technology and Environment. Subjects have included a wide range of environmental problems, for example, water quality and supply, climate change, open space and growth, hazardous waste and acid rain.

Division 42: Energy and Resources. These projects have focused on energy supply, alternative energy technologies, conservation, and the economic and policy choices made or proposed to govern this industry.
**Division 43: Health Care and Technology.** Projects in this division have focused on the technologies and cost of health care delivery in the US. Ethical questions in health care have also been addressed, including abortion, stem cell research, cloning, and “right to die” issues.

**Division 44: Urban and Environmental Planning.** Land use planning, historic preservation, urban renewal, transportation systems and the impacts of infrastructure design are among the subjects studied in this division.

**Division 45: Science and Technology – Policy and Management.** IQPs in this area focus on public policy as it is used to promote or constrain technology. Examples include both public and private efforts to promote scientific research, manage innovation and understand how changes in technology result in a changing business and economic environment.

**Division 46: Social Studies of Science and Technology.** Students working on these projects use a socio-logical approach to understanding the impact of technology on society. Topics have included equity issues (gender, race, ethnicity), technological literacy, and technology assessment and forecasting.

**Division 47: Safety Analysis and Liability.** The study of safety analysis introduces students to the subjects of risk analysis, negligence, and standards of care in product design and use. Projects have also focused on fire risk and safety, risks associated with natural disasters and risk management.

**Division 48: Humanistic Studies of Technology.** Humanistic studies illuminate the social context of science and technology. History, literature, philosophy, religion and the fine arts all speak of the nature of human problems and the scientific and technological approaches used to address personal and social problems. Each discipline provides analytic methods for examining society/technology problems. Students working in this division should prepare by taking appropriate humanities courses before beginning their project.

**Division 49: Economic Growth, Stability and Development.** Division 49 focuses both on problems of stability and change in mature economies, and the economic problems of developing nations. Tools of economics are used to understand the relationship between technology and growth. Projects address policy issues of appropriate technology, technology transfer among countries and trade, among others.

**Division 50: Social and Human Services.** These projects address the problems and technologies involved in the provision of community services, broadly defined. Projects have addressed services for the mentally or physically disabled, for juveniles, seniors, consumers, and public school students.

**Division 51: Education in a Technological Society.** Many WPI students have helped design and test science and engineering curricula for students at all grade levels, from elementary to high school. Projects in this area have also addressed the design and testing of computer assisted learning environments and other applications of technology to learning.

**Division 52: Law and Technology.** Legal systems regulate technology in all aspects of life, from food safety to pollution control to intellectual property (patents, copyright). Projects in this division explore the role of courts, agency regulations and legislation in controlling the impacts and use of technology.

**Division 53: Historic and Artistic Preservation Technology.** The technologies of art conservation and restoration, combined with the policy and values issues involved in the preservation of historic places and works of art, form the subject matter of IQPs completed in this division.
In addition to IQP and MQP opportunities on campus, through the Global Projects Program, overseen by the Interdisciplinary and Global Studies Division, WPI students have many opportunities to complete a project for a term at one of WPI’s off-campus project sites. Some centers are residential, with students traveling to and living on site for a term, while others offer the opportunity to complete an off campus project in Worcester, Boston, or other nearby communities. Project work conducted at these sites provides teams of students with extraordinary opportunities to learn by solving real-world problems provided by industrial, non-profit, non-governmental or government agencies.

Application for IQP work in these programs begins in the fall with the Global Fair. At the Fair, IQP, MQP, HUA and exchange program directors will be available to talk with students about these opportunities. Students should apply in Term A of the year preceding the year in which they would like to participate. Further information is available at the Interdisciplinary and Global Studies Division in the Project Center or through the WPI Global Portal: http://www.wpi.edu/+globalportal

Application processes are competitive and accepted students must complete a series of pre-departure orientations and submit required paperwork to be eligible to travel.

All students accepted to an off-campus IQP Center will be registered for the preparation course ID 2050 in the term immediately preceding their time off campus. Students must be making satisfactory progress in their academic program in order to participate. Students are highly discouraged from overloading during the preparatory term.

Prior to leaving campus for a project program site, each student is required to complete a project registration form as described on page 204.

### OFF-CAMPUS PROGRAMS

All programs offer students the opportunity to complete a project in one term of full-time work. Advance preparation is required. Faculty advisors are in residence at IQP sites and some Humanities and Arts and MQP sites.

### PROGRAMS IN NORTH AMERICA

#### BAR HARBOR PROJECT CENTER – IQP and HUA

**Director:** Prof. F. Bianchi, Alden Memorial, 205

The Bar Harbor Project Center is located in one of the most beautiful areas of the country on the coast of Maine. Students live and work in close proximity to the Acadia National Park and numerous research, historical, environmental, and arts organizations. Students stay in cottages on the College of the Atlantic (COA) campus. In addition to traditional dorm living amenities, students have in-house kitchens, optional meal plans, and campus security. While similarities to college living are noticeable, the resemblance quickly disappears.

Nestled on the east side of Mt. Desert Island, the rocky coast, mountainous terrain, and ocean vistas of the area have long been the destination of researchers, explorers, scientists, artists, and curious visitors. In addition to the academic and scholarly experiences that await WPI students, the summer in Bar Harbor offers the lure of hiking, biking, rock climbing, swimming, sailing, nature walking, kayaking, whale watching, and more.

Bar Harbor Projects have a strong focus on the relationship between the humanities, technology, the arts, and the environment. Projects involve research and creative activities intended to offer insight into the preservation, improvement, appreciation, and sustainability of the natural environment.
**BOSTON PROJECT CENTER – IQP**

Co-Directors: Prof. S. Tuler, Project Center, 211A  
Prof. P. Mathisen, Kaven Hall, 209E

Boston is a world-class city, featuring a wealth of cultural, educational, recreational, and tourist attractions. Students at the Boston Project Center complete their projects while living in Worcester and commuting to Boston. This arrangement helps to reduce student expenses while also providing ample opportunities to explore the City’s many offerings—they can trek the Freedom Trail, visit the Museum of Science, take in a Red Sox game at Fenway Park, relax at the Boston Public Garden, and head over to Boston’s many shopping areas, restaurants, and entertainment venues.

Projects typically address topics related to sustainability and climate change, the environment, and public health, and often include field work in the City’s neighborhoods and the greater Boston area. Sponsors have included the US Environmental Protection Agency, Massachusetts Department of Environmental Protection, Massachusetts Department of Energy Resources, Massachusetts Department of Public Health, City of Chelsea and MIT Sea Grant, Boston Fire Department, New England Aquarium, the Boston Harbor Association.

**GALLO-MODESTO, CA PROJECT CENTER – MQP**

Co-Directors: Prof. H. Nowick, Goddard Hall, 123  
Prof. N. Kazantzis, Goddard Hall, 224A

E & J Gallo Wineries, headquartered in Modesto, has winery operations in Sonoma and Napa Valleys, in Livingston and Fresno. Modesto is located in the San Joaquin Valley, which is approximately 88 miles east of San Francisco and 84 miles northeast of San José. Livingston is approximately 45 minutes south of Modesto and Fresno is approximately two hours south of Modesto.

Students participating in E & J Gallo Wineries-sponsored MQPs in C-Term also take part in a Preliminary Qualifying Project (PQP) in B-Term. During this PQP, students perform background research in their project area, learn about the company and industry where they will be completing their project, and hold discussions with their Gallo mentors and WPI advisors. Outcomes of the PQP include a detailed proposal describing the overall project, background related to the project, specific problems to be addressed, the approach the students will adopt to solve project problems, and project deliverables.

Acceptance to the E & J Gallo Wineries MQP program is based on judicial and academic standing and performance, essay response, demonstration of maturity, independence and teamwork, availability of projects in a specific area, qualifications relevant to the project offered, and completed interviews.

The projects are conducted during C-Term in California. Students work full-time at one of the sponsor’s sites (most likely Modesto) for eight to nine weeks, from early January through early March. Student teams work with a mentor from the company and WPI faculty advisors. The project work will include the completion of a PQP, an MQP report, and final presentations to Gallo representatives at the MQP site.

*Application to this site is restricted to Chemical Engineering majors only.*

**MASSACHUSETTS WATER RESOURCE OUTREACH CENTER – IQP**

Co-Directors: Prof. C. Dehner, Project Center, 210B  
Prof. P. Mathisen, Kaven Hall, 209E

The Massachusetts Water Resource Outreach Center (WROC) is an off-campus project center operating in both Central & Eastern Massachusetts. The WROC is affiliated with both the Worcester Community Project Center (WCPC) and the Boston Project Center. Students will commute to work at the Worcester Community Project Center offices in downtown Worcester or at their sponsoring organization or municipality.

The WROC is dedicated to assisting Central and Eastern Massachusetts municipalities or watershed associations with their water resource needs. Students will have the opportunity to work on groundbreaking water issues such as storm water management, climate change mitigation, and drinking water infrastructure.

WCPC-WROC students will be partnered with a Central Massachusetts municipality and a water resource expert. WROC students will receive regular water related tutorials during their PQP meetings. The WROC will complete non-advocacy, hands-on, action oriented, research projects of immediate utility to Central and Eastern Massachusetts cities and towns.

**MICROSOFT-CAMBRIDGE, MA PROJECT CENTER – MQP**

Director: Prof. M. Claypool, Fuller Laboratories, B24A

Students at the Microsoft Project Center have the opportunity to work with one of the largest companies in the software industry in one of the most progressive and engaging cities in the world. Students conduct their projects at the Microsoft New England Research and Development (NERD) Center, a hub of activity and research that draws local high-tech talent from the greater Boston area.

The NERD Center is located near Kendall Square in Cambridge, Massachusetts. Cambridge offers easy access to the many highlights of Boston and also boasts several prestigious universities and cultural, historic, and artistic enterprises.

Students begin their project experience by conducting a Preliminary Qualifying Project (PQP) during A-Term. They perform background research in their project areas, learn about the industry, and hold discussions with Microsoft mentors.

Projects are conducted during B-Term, when students work full-time at the NERD Center or approximately eight weeks, from mid-October through mid-December. Each project team works with a mentor from Microsoft and a WPI faculty advisor. Project work concludes with an MQP report and a presentation to Microsoft.

*Application to this site is restricted to Computer Science majors only.*
MIT LINCOLN LABORATORY-LEXINGTON, MA
PROJECT CENTER – MQP

Director: Prof. E. Clancy, Atwater Kent Laboratories, 304
MIT Lincoln Laboratory was founded in 1951 as a federally
funded research and development center for MIT. Lincoln
Laboratory’s fundamental mission is to apply science and
advanced technology to critical problems of national security.
The scope of these problems includes air defense, communica-
tions, space surveillance, missile defense, tactical surveillance
systems, and air traffic control.

All projects are conducted at Lincoln Laboratory, located in
Lexington, MA. Students commute from WPI to Lexington by
chartered bus (provided by WPI).

Projects at Lincoln Laboratory focus on a variety of areas,
and project teams are often interdisciplinary. Teams work with a
mentor from Lincoln Laboratory as well as one or more WPI
faculty advisors.

During A-Term, students work on their MQPs at Lincoln
Laboratory full-time (five days a week) for approximately nine
weeks. The first two weeks, arranged immediately prior to the
start of A-Term, serve as a PQP period.

Many students selected for this program also seek summer
employment at Lincoln Laboratory for the summer preceding
the project.

Application to this site is restricted to Aerospace Engineering,
Computer Science, Electrical and Computer Engineering, Math-
ematical Science, Mechanical Engineering, Physics, Robotics
Engineering majors.

MITRE-BEDFORD, MA PROJECT CENTER – MQP

Co-Directors: Prof. C. Shue, Fuller Laboratories, 236
Prof. A. Wyglinski, Atwater Kent, 230

MITRE is a nonprofit organization chartered to work on
federally funded research projects for the Department of
Defense (DoD), Federal Aviation Administration (FAA), and
other government agencies.

All MITRE projects are conducted at the Mitre-Bedford
center in Bedford, MA. Students commute from WPI to
Bedford by bus. Only U.S. citizens can be considered for this
program.

MITRE provides project opportunities for Electrical and
Computer Engineering and Computer Science majors. Most
students begin with a paid internship at MITRE during the
summer before their project work commences. The internship
enables students to perform background research in their project
areas and liaise with MITRE company mentors.

WPI provides daily transportation from campus to Bedford
at no cost to student participants. Each team works with a
company-designated mentor and WPI faculty advisor. Project
work concludes with an MQP report and formal presentation at
MITRE.

Admission is competitive, limited to U.S. citizens, and based
on academic performance, maturity, independence, and
project-relevant skills determined during interviews.

Application to this site are primarily sought from Computer
Science, Electrical and Computer Engineering, Physics, and
Robotics Engineering majors. All other majors interested in this site
need to contact the project center co-directors.

NANTUCKET, MA PROJECT CENTER – IQP

Director: Prof. D. Golding, Project Center, 212
Located 30 miles south of Cape Cod, the island of Nantucket is
14 miles long and about 3.5 miles wide. It has a population of
10,000 year-round residents and attracts an additional 40,000
tourists each summer.

Nantucket was once a booming whaling center but is now
primarily a summer resort and tourist destination. The island
itself has changed little since the 17th century and retains many
cobblestone streets, historic homes, and shops. The entire island
is a National Historic District and has several excellent muse-
ums, many wonderful public beaches, and protected conserva-
tion land covering about 40% of the island.

The Nantucket Project Center is a residential program with
two resident faculty advisors.

Nantucket offers a unique project environment because of its
distinctive conflicting features. It is a high-end tourist destina-
tion in the summer, when tourists draw on the island’s limited
resources; it is a historic site deeply committed to preservation;
and it is an environmentally sensitive site where much of the
land is protected. These features often clash, creating on-going
challenges for town government, island residents, and local
businesses. Many projects seek to resolve such issues in mutually
beneficial ways.

Past projects have focused on issues of environmental
sustainability (e.g., alternative energy and energy conservation),
assisting town departments (e.g., in education about tick-borne
diseases and developing information security protocols), and on
museum studies (e.g., evaluating museum exhibits and programs
and providing improved methods of wayfinding and interpreta-
tion). Project sponsors have included the Maria Mitchell
Association, the Nantucket Historical Association, the Athene-
um, the Nantucket Public Schools, Sustainable Nantucket,
Housing Nantucket, ReMain Nantucket, and various depart-
ments and committees of the Town of Nantucket.

PIONEER VALLEY, MA PROJECT CENTER – IQP

Director: Prof. K. Sweeney, 50 Prescott, Suite #1324
The Pioneer Valley Project Center is devoted to social innova-
tion and economic development in western Massachusetts. The
Center tackles community-based challenges with student team
projects that link business, science, and technology to social
innovation in western Massachusetts. IQP student teams and
Robert A. Foisie School of Business graduate independent study
teams collaborate with community organizations and Spring-
field Technical Community College Honors Program students
on major projects in the Pioneer Valley of Massachusetts. The
Project Center has a particular focus on the urban core and
communities surrounding Springfield, Chicopee, and Holyoke,
but it supports projects throughout the region that have a
genuine impact on important issues like healthy food, local
agriculture, the environment, urban revitalization, and
entrepreneurship.

For example, as part of a recent project sponsored by the
non-profit, community development firm DevelopSpringfield,
IQP students played a pivotal role in developing an operational
model for a full-service, healthy, supermarket in an urban “food
desert” in the Mason Square section of Springfield, Massachusetts. The USDA defines a food desert “as urban neighborhoods and rural towns without ready access to fresh, healthy, and affordable food.” The lack of access contributes to a poor diet and can lead to higher levels of obesity and other diet-related diseases, such as diabetes and heart disease. The students evaluated the feasibility of three operating models for the supermarket, and they analyzed various critical considerations for the market, including environmental sustainability, energy efficiency, safety and security, and local community concerns.

If you are interested in joining the Pioneer Valley Project Center for your IQP, your full-time assignment will be in either C or D Term. You will generally work in western Massachusetts two or three days per week, and you will spend the remainder of your time at WPI conducting your research and preparing your analysis. Because of the relatively close proximity of Springfield to Worcester (less than 1 hour’s commute), you may continue to reside in the Worcester area if you choose.

In addition to offices and other facilities in the Robert A. Foisie School of Business in Gateway Park at WPI, our base of operations locally in western Massachusetts is in the Springfield Technology Park. The Technology Park is situated in a unique historic setting on the grounds of the former Springfield Armory. The Springfield Armory, founded by George Washington and Henry Knox in 1777, is now a U.S. National Park, featuring the world’s largest historic firearms collection. Today, the site also provides modern, technologically enabled workspaces in original 1880s Armory buildings. The Technology Park shares the Armory grounds with Springfield Technical Community College, where students may access academic resources just across Federal Street.

**SANTA FE, NM PROJECT CENTER – IQP**

Director: Prof. F. Carrera, Project Center 214B

The capital of New Mexico, Santa Fe is the oldest (1610 AD) and highest (7,199 ft.) state capital in North America. Nestled at the foot of the Sangre de Cristo Mountains, this quaint town of 70,000 is perched high above the Rio Grande in north-central New Mexico. In less than half an hour, it is possible to travel from downtown Santa Fe to the national forest, where skiing above 13,000 feet is available until April.

Santa Fe is a major center for Native American culture, a mecca for both active and retired scientists and avant-garde artists. Due to the proximity of the Los Alamos National Lab and the establishment of the world-renowned Santa Fe Institute, founded by George Cowan (WPI Class of ’41), the city has attracted world-class researchers, including several Nobel-prize winners, in the fields of physics, biology, economics, and political science.

Recently, the Santa Fe Complex (SFXs) was created to provide a space where art and science can interact for the benefit of the community. The WPI Santa Fe Project Center has established a solid collaboration with the SFXs, and most projects are hosted in the SFXs refurbished warehouse, near the rail yard in downtown Santa Fe.

Despite its small size, Santa Fe is a sophisticated cosmopolitan and eclectic place where exciting opportunities for projects exist, particularly in three areas: Water Conservation, Renewable Energy, and Urban Planning. Most projects are conducted through the Santa Fe Complex for city and state departments or for local nonprofits.

Given the inter-ethnic history of this part of the United States, research collaborations are often established with local Native American institutions on important environmental, cultural, and societal issues.

**SILICON VALLEY, CA PROJECT CENTER – MQP**

Director: Prof. M. Claypool, Fuller Laboratories, B24A

Silicon Valley, a region of California in the San Francisco Bay area, is home to many dynamic companies in the computer industry and related high-tech fields. Students at the Silicon Valley project center have opportunities to work with companies such as SRI International (a research center), Disney Interactive, NVIDIA, and others. Several students have taken full-time positions with sponsors and other companies in Silicon Valley following their projects.

During their stay in Silicon Valley, students can also explore area attractions including theme parks, vineyards, gardens, sporting arenas, shopping centers, and more. Silicon Valley is home to San Jose, the third largest city in California, and provides a gateway to both urban and natural points of interest.

Students participating in the Silicon Valley Project Center conduct a Preliminary Qualifying Project (PQP) in the term preceding the project. During their PQP, students perform background research in their project areas, learn about the companies and industries they will be working with, and hold discussions with their company mentors.

Projects are completed during C Term in Silicon Valley. Students work full-time at sponsors’ sites for approximately nine weeks. Each team works with a mentor from the sponsoring company and a WPI faculty advisor. Project work includes the completion of an MQP report and a presentation to the sponsoring organization.

Admission to the Silicon Valley Project Center is based on judicial and academic standing and performance, essay response, evidence of maturity and independence, availability of projects in a specific area, qualifications relevant to the project offered, and an interview.

Application to this site is restricted to Computer Science and Interactive Media and Game Development majors.

**WALL STREET PROJECT CENTER – MQP**

Director: Prof. K. Sweeney, 50 Prescott, Suite #1324

In its more than fifteen year history, the Wall Street Project Center has been dedicated to student-led, project-based learning in finance and technology. The Project Center supports some of the top global financial services firms with critically important strategic and operational initiatives (with a particular emphasis on financial technology).

Each year, senior undergraduate student teams from WPI complete MQPs in B Term with investment banking and other financial firms on Wall Street and elsewhere (including sometimes the United Kingdom). The Wall Street Project Center is a great stepping stone for motivated students who are looking to make the transition to a career in the financial services industry. It provides both the student and financial services sponsor with
an opportunity to accomplish a real world project in highly regarded and recognizable financial firms like Barclays, Angelo Gordon, BNP Paribas, and JP Morgan.

Students typically work in teams of two to three. The teams are interdisciplinary, and they can include students with backgrounds in technology, management, and math. Students from any of the following majors are eligible to participate in the Wall Street Project Center: Management, Management Engineering, Industrial Engineering, Computer Science, Electrical & Computer Engineering, Mathematical Science, and Actuarial Science. Each of the project sponsors has needs for committed project team members with interest in technology, finance, and investments.

Most projects are based in the metropolitan New York City area. The New York area is a high-powered center of global financial activity, vibrant art and entertainment, and world-class multicultural cuisine. Other possible locations (like London) share these attributes. The combination of unique and exciting project locations combined with significant, high-impact project initiatives makes the Wall Street Project Center an excellent MQP choice.

WASHINGTON DC PROJECT CENTER – IQP

Director: Prof. K. Rissmiller, Salisbury Laboratories, 315
The Washington, D.C., Project Center offers students the opportunity to work on projects with prestigious sponsoring agencies while living in the heart of the District of Columbia. The Project Center is located in an attractive neighborhood near Dupont Circle, the National Mall, businesses, embassies, and international agencies. Students can take advantage of this ideal location and easy access to the Metro to enjoy an endless supply of free museums, national monuments, and impressive buildings that house the seat of national government.

Many projects have been completed with agencies such as the U.S. Coast Guard, the Environmental Protection Agency, the U.S. Patent and Trademark Office, the National Science Foundation, and the Consumer Product Safety Commission.

WORCESTER COMMUNITY PROJECT CENTER – A CENTER FOR COMMUNITY EMPOWERMENT AND ENVIRONMENTAL RESPONSIBILITY – IQP

Director: Prof. C. Dehner, Project Center, 210B
Assistant Director: L. Roberts, Project Center
The Worcester Community Project Center (WCPC) is an off-campus project center. Students will commute to work at the Worcester Community Project Center offices in downtown Worcester or at their sponsoring organization.

The Worcester Community Project Center develops projects both from the grass roots and from the public sector. This means that project teams work hand-in-hand with government agencies, local politicians and Worcester based organizations on important social and environmental issues that impact your Worcester neighbors.

Students who choose the WCPC get to have diverse cultural experiences without leaving Worcester. Projects focus on questions of science and technology as they relate to different social groups. Through community engagement students learn how such questions affect people with different incomes, races, ethnicities, and genders.

WPI-STANTEC-BOSTON, MA PROJECT CENTER – MQP

Co-Directors: Prof. F. Hart, Kaven Hall, 206
Prof. S. LePage, Kaven Hall, 209A
Stantec is a global consulting firm specializing in engineering, architecture, environmental sciences, project economics, and more. The firm has operations in Canada, the United States, and the Caribbean. To date, students have completed projects for Stantec in Edmonton, Alberta; Lexington, Kentucky; and Halifax, Nova Scotia. C’16 project location will be at the Stantec Office in Boston and the Stantec Office in Westford.

A range Civil and Environmental Engineering project topics are possible at both Stantec offices in the Boston area (Boston and Westford). You should visit stantec.com to get more information on featured projects that have been conducted at these offices. Depending on student interest and available project opportunities, an appropriate CEE faculty advisor will be available for your project. You are also encouraged to speak to a CEE faculty member to discuss their project topic interests.

PROGRAMS IN EUROPE

ALBANIA PROJECT CENTER – IQP

Co-Directors: Prof. P. Christopher, Stratton Hall, 305B
Prof. R. Hersh, Project Center, 211B
Albania is located in southeastern Europe, bordering the Adriatic Sea, across from Italy and north of Greece. It is a small mountainous country with both Mediterranean and Alpine climates. After centuries of foreign occupation followed by decades of oppressive communist rule, Albania is embracing democracy and capitalism. Although it is a poor, developing nation, today Albania has one of Europe’s fast growing economies. Travel guide Frommer’s declared Albania to be the “Top Value Destination for 2012.” The following is from Lonely Planet, which ranked Albania as the Number One destination in the world in 2011: “Not just the preserve of the adventurous, Albania is a warm and sincerely hospitable country – with enough rough edges to keep it interesting.” While Albania has numerous small cities of historical or archeological interest, the capital, Tirana, is a bustling metropolis with heavy traffic and chaotic construction, but also with cultural activities, museums, good restaurants, cafes and nightlife. It has a large population of students eager to practice their English.

Albania has many needs that lend themselves to IQPs. In addition to environmental projects, we are planning projects in education, tourism and business. In its first year, 2013, students worked on projects with the following titles: Advancing E-waste Recycling in Albania; Community-based Tourism at Pellumbas Village, Albania; Developing a Water Education Program in Albanian High Schools. In the future we will be working with a pre-engineering high school in Tirana, to introduce programs in fields such as robotics or game design. We have also connected with an agency in Albania whose mission is foster innovation and entrepreneurship through technological training. We expect
to have an agro-business project involving beekeeping. Another example of an agro-business project involves the sustainability of harvesting medicinal herbs from Albania’s forests. Albania is not all fun and games, but if you like adventure and are willing to accept some challenges living there, Albania may be the site for you.

**BUDAPEST PROJECT CENTER – MQP**

Director: Prof. G. Sarkozy, Fuller Laboratories, 141

Hungary has gone through a deep-rooted transformation during the past 20 years, and today it is a free and democratic country with a smoothly working market economy. The country has enjoyed steady GDP growth, a bullish stock market, and a decreasing inflation rate. Hungary became a full member of the European Union on May 1, 2004, and took the rotating EU presidency in 2011.

The country is a link between Eastern and Western Europe. Currently, new investment is revitalizing Hungary and grand old Budapest is being restored with breathtaking Old World grandeur and thriving cultural life. It is the country’s cultural, political, intellectual, and commercial heart, teeming with cafés, restaurants, and markets.

Situated on both banks of the Danube River, the city unites the colorful hills of Buda and the wide boulevards of Pest. Budapest is simultaneously peaceful and bustling—it treasures the old and embraces the new. With all of its changes, it’s an exciting place to visit.

Computer Science MQPs will take place at the Computer and Automation Research Institute in Budapest (MTA SZTAKI), Hungary’s national research center for information technology, computer science, and related fields. In addition to pursuing basic and applied research, system design and integration, consulting, and software development are among activities of the Institute. A special emphasis is placed on education-related activities; the center has close affiliations with several Hungarian and European universities, including the Budapest University of Technology and Economics and the Eötvös Loránd University.

Application is restricted to Computer Science and Mathematical Sciences majors.

**DENMARK PROJECT CENTER – IQP**

Director: Prof. S. Taylor, Washburn Shops, 101

IQP projects in Denmark span a wide range of topics, with an emphasis on environmental issues. (although projects have included other topics such as technologies for people with disabilities, museums, and education). Most projects are sponsored by not-for-profit agencies such as the Danish Consumer Council, Miljøpunkt Norrebro, and the Danish Waste Association (Dansk Affaldsforening).

**GREECE PROJECT CENTER – IQP**

Director: Prof. R. Hersh, Project Center, 211B

Founded in 315 BC, Thessaloniki, located in northern Greece, is a modern, bustling city, the second largest in the country. It is located on the Aegean Sea, less than 60 miles from Mt. Olympus and some 300 miles from Istanbul. For more than two millennia it has been the major seaport for southeastern Europe, linking the Mediterranean with the Balkans, Europe with Asia. The city’s rich and diverse history can be seen in its architecture: a vast Roman forum was uncovered in the commercial heart of the modern city; in the old part of the city, Ano Poli, a UNESCO World Heritage Site, one can visit Turkish bathhouses from the 14th century and Byzantine churches. The city, a former Culture Capital of Europe, is well known for its cuisine, its open air markets, and its lively student population—Aristotle University, the country’s largest, is located near the city center. The beautiful beaches of Halkidiki are less than 30 minutes away, as are well known archaeological sites and outdoor recreational activities, such as hiking, rafting, and wind surfing.

The WPI Thessaloniki Project Center will collaborate with the students and faculty at Perrotis College of Agriculture, Environment, and Life Sciences, which is part of the highly regarded American Farm School. The college is located on the outskirts of Thessaloniki a short bus ride away from the city center. Students will work on projects proposed by community organizations, farmers’ associations, and others participating in the region’s food sector. Likely topics include developing innovative food production practices to promote small scale urban agriculture, xeriscape technologies to reduce water use, marketing strategies for new producers, and developing food planning policies to help create a more resilient and sustainable food system. Projects will take place in Thessaloniki and surrounding rural areas. We are seeking motivated students who want to be part of the Center’s ground breaking first year.

**KONSTANZ, GERMANY EXCHANGE PROGRAM**

Director: Prof. U. Brisson, Salisbury Laboratories, 333

Students will study at the University of Applied Sciences (HTWG-Hochschule für Technik, Wirtschaft und Gestaltung) in Konstanz, located on beautiful Lake Constance. Konstanz is situated in the southwest corner of Germany, literally across the street from Switzerland and also very close to Austria. Konstanz is 214 miles from Frankfurt and 46 miles from Zürich. With a population of 81,000, it is intimate in size and charm, with stunning architecture in its historic town center and a history that reaches back to the first century BC. The HTWG is situated on the left bank of the Rhine where it exits Lake Constance and sets out on its journey to the Netherlands, 820 miles to the north (1320 km). Konstanz is located in the
German state of Baden-Württemberg and is known for its particular specialties such as Felchen (fish from Lake Constance) and Flammkuchen (a kind of pizza).

Courses: To complete their Humanities and Arts Requirement, students can take language and culture courses offered at the HTWG. Culture courses usually include a field trip -- to Berlin for example. For courses toward specific majors at WPI, students need to clarify with their professors whether credits are transferable or not.

Opportunities: German language and culture courses; subject specific science and engineering courses in German depending on language skills.

**LONDON HUMANITIES PROGRAMS**

Co-Directors: Prof. V. Manzo, Alden Memorial, 209
Prof. K. Boudreau, Salisbury Laboratories, 125

*Newsweek* has dubbed London “the coolest city on the planet.” It is home to some of the world’s most vibrant theatre and music, outstanding museums, and ambitious architecture.

Once the center of an empire, London today is the political, economic, and media hub of the British Isles, with an influence that continues to radiate well beyond its borders. A designated long weekend makes possible travel to Scotland, Wales, or Ireland; students may also plan shorter trips to places such as Oxford or Canterbury.

The London Humanities and Arts program is interdisciplinary in scope and intended for students with a background in a variety of areas in the humanities and arts. Students will study, with a WPI advisor, topics that might include the history, literature, music, theatre, or culture of Britain and Europe.

Students also complete individual projects on a theme that can draw on the unique resources of London, such as Shakespeare’s Globe Theatre, the Imperial War Museum, the Science Museum, and much more. An interdisciplinary program, humanities and arts topics are not limited to the history or literature of London, but all of the projects take advantage of the city.

The London humanities and arts program is appropriate for students interested in art history and architecture, drama and theatre, history, literature, music, philosophy, religion, or writing and rhetoric. Humanities and arts minors and MQP team members may participate at the discretion of the professor advising in London during the term.

**LONDON PROJECT CENTER – IQP**

Director: Prof. D. Golding, Project Center, 212

*Newsweek* has dubbed London “the coolest city on the planet.” It is home to some of the world’s most vibrant theatre and music, outstanding museums, and ambitious architecture. London was once the center of an empire, and today it is the political, economic and media hub of the British Isles, with an influence that continues to radiate well beyond its borders.

Many interesting cities (e.g., Bath, Brighton, Oxford) and tourist attractions (e.g., Stonehenge) are within easy reach, and a designated long weekend allows students to travel further afield in the UK and the rest of Europe.

The London Project Center challenges students to identify practical solutions to real-world problems. Many projects deal directly with sustainable development in the urban environment, ranging from efforts to promote alternative energy and reduce carbon emissions to efforts to provide better services (e.g., housing and transportation) to disadvantaged members of the community. Teams work with local government agencies and NGOs on strategies that entail careful consideration of the issues environmental protection, economic development, and social justice. An equally large number of projects focus on exhibit development and evaluation and visitor education and outreach at famous museums, such as the British Museum, the Museum of Science, and the London Transport Museum.

**MOSCOW PROJECT CENTER – IQP**

Co-Directors: Prof. S. Nikitina, Salisbury Laboratories, 22
Prof. O. Pavlov, Salisbury Laboratories, 310A

Spanning a wide expanse of Europe and Asia, all of 12 time zones, Russia is the largest country in the world in terms of land mass, natural resources and opportunities for economic and technological growth. Students at the Moscow Project Center have a unique opportunity to become acquainted with the people of Russia (both in Moscow and Saint-Petersburg) and to help address local problems by working on a variety of technological, human resources, cultural and environmental projects.

Despite its challenges, Russia is enormously appealing because of its rich history, highly educated population, unique scientific and cultural contributions and unbounded potential for further development. The months of October–September in Moscow are balmy and bountiful and offer great opportunities for WPI students to explore the city and the countryside, sample Russian achievements in space exploration, see the museums and sites of the Kremlin, Vladimir and Suzdal and marvel at ingenious design of bridges and fountains of Saint Petersburg.

WPI students work in multicultural work settings on projects proposed by local nonprofit organizations, universities, and governmental and non-governmental organizations. Most projects provide the opportunity to work on urgent technological and sustainability issues and are completed in close partnership with the students of the Financial University, which adds a special dimension to cultural immersion of all participants in this truly international work experience. WPI Moscow Center is based on the Financial University Campus which offers centrally located dorm lodgings, Russian language and cultural programs and many opportunities to interact with local students and participate in the Russian college life – theater, dance, music, athletics and discussion clubs. Introductory Russian classes will be offered to all students to equip them with essential language skills. While most projects take place in the city of Moscow, there will be opportunities for a trip to Saint-Petersburg and a visit to the ancient cities of the Russia’s Golden Ring, Vladimir and Suzdal.
NANCY PROJECT CENTER – MQP

Director: Prof. S. Kmiotek, Goddard Hall, 120

Nancy is a medieval city of about 350,000, located in the heart of the beautiful Lorraine region. The city is well connected by train to Paris, Frankfurt, and Brussels (each about 200 miles), and Luxembourg (75 miles). With the newly launched TGV Est service, travel from Paris to Nancy is reduced to 90 minutes and the trains are frequent and comfortable.

The “vieille ville” (old city) region of Nancy is known for its small streets, beautiful mansions, museums, and historic walks. There is a large student population, and Nancy offers plenty of sports, concerts, movies, shopping, and eating places that are of interest to students.

Projects will be done in collaboration with l’Ecole Nationale Supérieure des Industries Chimiques (ENSIQ), comprising five separate laboratories: Laboratoire de Chimie Physique Macromoléculaire (LPCM, Physical Chemistry of Macromolecules), Département de Chimie Physique des Réactions (DPCR, Physical Chemistry of Reactions), Laboratoire de Thermodynamique des Séparations (LTS, Thermodynamics and Separation Processes), and Laboratoire des Sciences du Génie Chimique (LSCG, Chemical Engineering Sciences).

Projects are chosen based on the interests and majors of applicant students. Application to this site is restricted to Chemical Engineering and Environmental Engineering majors.

VENICE PROJECT CENTER – IQP

Director: Prof. F. Carrera, Project Center, 214B

Called the most beautiful city in the world, Venice features a haunting atmosphere that exudes the splendor of its past. A city without cars, filled with outstanding historical, artistic, and architectural heritage, Venice owes much of its uniqueness to its symbiotic relationship with the sea and the lagoon.

Yet, despite its millenary history, the historic city of Venice is trying to adapt to 21st century lifestyles, while preserving its environmental, artistic, and cultural heritage. The rising cost of living in Venice has led to a dramatic exodus of its population, which decreased since WWII from 200,000 to 60,000, while tourism has ballooned to 12 million visitors per year.

Venice is a microcosm that reflects and magnifies many of the issues confronting the rest of the world; at the same time it is a place that will allow you to experience a unique, more relaxed pace of living.

Since its founding in 1988, IQPs at the Venice Project Center provide an opportunity for students to see the implementation of their projects for the benefit of an entire city.

Projects are conducted for Venetian, American, and international organizations and include environmental, socioeconomic, artistic, cultural, and technical concerns important to the revitalization of this historic city.

WORCESTER, ENGLAND PROJECT CENTER – IQP

Director: Prof. R. Krueger, Salisbury Laboratories, 223C

Just two hours northwest of London and less than an hour to Birmingham and its international airport, Worcester is well-connected to the rest of the UK and a popular choice for students.

PROGRAMS IN AFRICA/MIDDLE EAST

CAPE TOWN PROJECT CENTER – IQP

Director: Prof. S. Jiusto, Project Center, 205

Cape Town is one of the world’s most beautiful cities. Located at the southern tip of South Africa, the city is situated between the Atlantic and Indian Oceans, with the Table Mountain range running through the city and down the Cape of Good Hope.

Cape Town is both a cosmopolitan city with visitors and residents from around the globe, and a city dealing with problems many developing nations face, such as poverty and rapid urban growth.

South Africa is culturally diverse and still creating a future for itself in the aftermath of apartheid. Cape Town offers music, art, and theatre; it is home to many important historical and cultural sites.

Students arrive just as the wonderfully temperate summer is beginning, and travel to some of the most interesting landscapes in Southern Africa. Students can visit the African bush to see wild animals, hike along stunning terrain, go surfing, enjoy great food, and meet interesting people.

Cape Town projects typically focus on sustainable community development in lower-income areas, including “shanty towns,” where people live in shacks and without adequate provision of basic services. Many exciting projects have been completed with local partners on themes such as sustainable water and sanitation, energy, early childhood development, micro-business, multimedia communications, and urban planning. Students often work closely with community members and other teams to share insight and plan innovative, integrated solutions. Some projects involve hands-on construction activities. This project center is for intrepid, hardworking students eager to work in challenging environments to help “make a difference” in South Africa.

ISRAEL PROJECT CENTER – MQP

Director: Isa Bar-On, Washburn Shops 224

Israel is a young country based on a more than 2000-year history. It is a very diverse country where people of different origins and ethnicity live in dynamic tension. It is the cradle of three world religions; Judaism, Christianity and Islam, each with its corresponding holy sites. In recent years there has been rapid development in high technology innovation; water technology, software development, pharmaceuticals and others. Israel has been dubbed ‘Start-up Nation’, in a much-cited book published in 2009.
MQP sites for this project center will be dispersed over Israel depending on the major of interested students. The Eilat project site is located in a Kibbutz, a communal settlement, 20 mins north of Eilat in the desert. The Kibbutz houses the Arava Institute, a research center that focuses on environmental research; water, renewable energy, and sustainable agriculture. The Institute trains junior level students who originate from Israel, Palestine, Jordan and other countries worldwide. The educational program endeavors to promote cultural understanding and conflict resolution amongst these differing populations.

Application to this site is restricted to Biology & Biotechnology, Biomedical Engineering, Computer Science, Environmental Engineering, Industrial Engineering and Mechanical Engineering majors.

### MOROCCO HUMANITIES PROGRAM

Directors: Prof. W. A. B. Addison, Salisbury Laboratories, 238 Prof. T. El-Korchi, Kaven Hall, 101

Morocco, a developing nation, is a Muslim country located on the far Western tip of North Africa. While the country strives to preserve its historic traditional crafts in rug weaving, wood carving, and mosaic art, it is also seeking to improve through modernization the socio-economic welfare of its citizens. While student project work and educational travel will be conducted throughout Morocco, the project center is based in Rabat, the grand capital of the nation founded in 1146.

Students complete three one-third units to earn one unit of academic credit with studies in Arabic language, culture, and history. Their capstone project will involve learning from Moroccans about shared values, Islam, similarities and differences in popular culture, the effects of globalization, and other important contemporary issues.

### MOROCCO PROJECT CENTER – IQP

Co-Directors: Prof. W. A. B. Addison, Salisbury Laboratories, 238 Prof. T. El-Korchi, Kaven Hall, 101

Morocco, a developing nation, is a Muslim country located on the far Western tip of North Africa. While the country strives to preserve its historic traditional crafts in rug weaving, wood carving, and mosaic art, it is also seeking to improve through modernization the socio-economic welfare of its citizens. While student project work and educational travel will be conducted throughout Morocco, the project center is based in Rabat, the grand capital of the nation founded in 1146.

Projects address issues of water conservation and alternative agriculture in the Middle Atlas countryside, promoting ecotourism, developing the artisanal industry in textile weaving and mosaic tiles, restoration of historic Kasbah in Fes and Rabat and Roman ruins at Volubilis, financial support for orphans.

All students take an intensive course on the Arabic language.

### NAMIBIA PROJECT CENTER – IQP

Director: Prof. C. Peet, Salisbury Laboratories 331

The Republic of Namibia in southern Africa is characterized by extensive national parks, deserts, seaside ports, livestock farms, and small towns and villages. It also maintains an excellent infrastructure of maintained roads, and in the capital city there is clean water and a high-level services, although no real public transportation system. Students at the Namibia Project Center are based in Windhoek, the capital city, and stay in comfortable bed and breakfast lodging near WPI’s partner university, the Polytechnic of Namibia (soon to be the Namibia University of Science & Technology). Students work in the city as well as other parts of the country. They have numerous opportunities to visit national parks and other tourist attractions and to become familiar with African rural life.

Namibia’s well-developed governmental and non-governmental agencies at the national and municipal levels sponsor most projects, which generally focus on issues of sustainable development. Private sector organizations may also sponsor projects. Some projects take place in towns and peri-urban informal settlements. No prior knowledge of Africa is needed, but preparation includes a heavy commitment to learning about the culture of Namibia while preparing specifically for the project.

### PROGRAMS IN ASIA

### BANGKOK PROJECT CENTER – IQP

Co-Directors: Prof. R. Vaz, Project Center, 2nd Floor Prof. S. Tuler, Project Center, 211A

Situated in the heart of Southeast Asia, Thailand is an intensely beautiful country: a land of gilded temples, outdoor markets, and golden beaches.

Students at the Bangkok, Thailand Project Center have a unique opportunity to become acquainted with the people of Thailand and address some of the challenges common to developing nations by working on a variety of social and environmental projects. Thai people are among the friendliest and most hospitable in the world and have a great talent for enjoying life.

Accommodations near the prestigious Chulalongkorn University in the heart of Bangkok enable students to explore the city’s many attraction.

WPI students work in multicultural teams with students from Chulalongkorn University on projects proposed by local nonprofit organizations, universities, and governmental and non-governmental organizations. Projects take place in the city of Bangkok and surrounding rural areas, with many focusing on underserved communities.
BEIJING PROJECT CENTER – MQP
Co-Directors: Prof. J. Liang, Washburn Shops 311A
               Prof. A. Zeng, Washburn Shops 308

China is the largest exporter of goods and is considered the biggest consumer market for the world economy. Beijing is China’s capital city and a modern, industrialized metropolitan with rich cultural and historical heritage, as well as easy access to other major cities by train or airplane. Gaining a deep understanding of this country by conducting a Major Qualifying Project in Beijing is an effective way for WPI students to acquire and enhance their global competency. Moreover, the Beijing Project Center offers real-world project experiences for students to simultaneously practice their technical skills, apply their innovative ideas, expand their interpersonal abilities, and cultivate their entrepreneurial spirit in a global and innovative world. In particular, the Center expects to accept about 20 WPI students each year to work in teams with about 30 students from our partnering university in Beijing – Beijing University of Chemical Technology (BUCT), a highly ranked key technological university in China.

Each project team is formed by WPI students and Chinese students and guided by co-advisors from WPI and BUCT. Projects are completed within 7-8 weeks, and are sponsored by global companies with operations in China. WPI students will live on BUCT campus and may travel to other cities based on their project sponsor locations and project requirements. Applicants majoring in Chemical Engineering, Environmental Engineering, Industrial Engineering, Management Engineering, and Mechanical Engineering are considered for this Center.

Application to this site is restricted to Chemical Engineering, Environmental Engineering, Industrial Engineering, Management Engineering, and Mechanical Engineering majors.

HANGZHOU, CHINA PROJECT CENTER – IQP
Director: Prof. J. Rudolph, Salisbury Laboratories, 408B

Hangzhou is located on China’s booming southeastern coast and is one of China’s most beautiful and bustling cities. The capital of China’s richest province (Zhejiang) and one of China’s ancient imperial capitals, Hangzhou exemplifies China’s quest to become a modern economic power while retaining its unique historical identity. Students will see firsthand the beauty of China’s antiquity when walking along World Heritage Site West Lake in downtown Hangzhou and experience on a daily basis the booming growth of Hangzhou, China’s 4th largest metropolitan area with a population of 8 million. From Hangzhou, students can easily travel to Shanghai, only an hour away on the high-speed train, and to many cities on China’s seaboard as well as inland.

Project Types: green energy, urban housing, innovation and entrepreneurship, sustainable development, historical preservation, education reform, water challenges

HONG KONG PROJECT CENTER – IQP
Director: Prof. C. Peet, Salisbury, 331

The Hong Kong Project Center provides a gateway to one of the most dynamic and significant regions on the planet. Hong Kong radiates energy as it rapidly modernizes and takes the lead in economic development, high-rise building and urban planning, efficient transportation, artistic expression, educational reform, and environmental conservation. Students at the project center live in furnished apartments with small kitchens located in a typical Chinese residential neighborhood.

Students at the project center live in furnished apartments with small kitchens located in typical Chinese residential neighborhoods.

Project Types: Urban planning, greener environment, sustainable resource use, education innovation, economic and social issue.

JAPAN PROJECT CENTER – MQP
Director: Prof. J. deWinter, Salisbury Laboratories, 15

Japan is a country of contrasts: from the breathtaking natural beauty of Hokkaido to the frenetic sprawl of the Tokyo megalopolis; from the centuries-old tradition of Japanese calligraphy to the quirky humor of Anime; from kimono-wearing women to purple-haired punk rockers; and from world-leading electronic gadgetry to hand-made porcelain. Japan provides something unexpected at every turn.

Students at the Japan Project Center conduct their projects at either Osaka University or Ritsumeikan University, two of Japan’s leading universities. The city of Osaka is located in the Kansai region of Japan’s main island of Honshu and is Japan’s third largest city. Filled with business, food, and entertainment venues, as well as historic and cultural attractions, Osaka offers an eclectic mix of old and new.

Osaka is located within an hour of several other major cities: Kyoto, the “heart of Japan” that boasts many important cultural sites; Kobe, a harbor town with an interesting flavor; and Nara, a center of commerce and government. Projects run from about mid-June through A-Term, so students spend about four months abroad. This gives participants a much richer experience in Japan and ensures that teams have sufficient time to produce outstanding work. The first part of the project is considered an internship, while the actual MQP takes place during A-Term.

Admission to the CS/IMGD MQP Program in Kansai is based on the following criteria: academic standing and performance, evidence of maturity and independence, qualifications relevant to the anticipated projects, faculty references, and an interview. Interested students are also strongly encouraged to learn some elementary Japanese, although language proficiency is not required.

Application to this site is restricted to Computer Science and Interactive Media and Game Development majors.
INDIA PROJECT CENTER – IQP

Director: Prof. I. Shockey, Project Center, 209

The small city of Mandi, India is a community of 60,000 located in the northwestern foothills of the Himalaya in Himachal Pradesh. Outside the center, in a quiet valley, the IIT-Mandi is one of the newest additions to the Indian Institute of Technology, known as a premier Institution of National Importance in India. It is the only IIT in the Himalayas, set on a 500-acre campus with views of the foothills. The immediate area balances wildlife with facilities, providing access to hiking, bird watching, and plenty of outdoor recreation. This IIT was founded in July 2009 with the vision “To be a leader in science and technology education, knowledge, creation, and innovation, in an India marching towards a just, inclusive, and sustainable society”. With several hundred new students enrolled each year, the IIT plans to grow to host 6,000 Indian students in the next decade.

We are one of two project centers that work directly with fellow students at a project site. WPI students join with third year IIT students to form collaborative teams that work together with WPI and IIT faculty on each project. WPI students are hosted on campus, live in dorms, have the opportunity to join the campus meal plan, and enjoy all use of the facilities.

In addition to IIT collaboration, IQPs in Mandi, India will engage community agencies, local governmental agencies, and NGOs on issues primarily of sustainability. The India Project Center themes feature the social and environmental dimensions of urban and rural infrastructure, and community and ecosystem resilience in sub-Himalayan or high mountain regions. We are seeking adaptable and committed students that are willing to participate a highly rewarding program under changeable and possibly challenging conditions.

SHANGHAI, CHINA PROJECT CENTER – MQP

Co-Directors: Prof. D. DiBiasio, Goddard Hall, 125
Prof. H. Zhou, Life Sciences & Bioengineering Center, 4001

With 18.7 million inhabitants, Shanghai is the largest city by population in the world. It’s also the commercial and financial center of China and the largest base of Chinese industrial technology.

Modern Shanghai has three areas of interest to those who visit: sightseeing, business, and shopping. The city is home to several historical landmarks and attractions, many centered around the People’s Square or Huangpu River. Shanghai is also a mecca of fashion, art, cinema, museums, and sports, and offers a reprieve from the urban pace in extensive green areas and parks.

Projects are completed in collaboration with the School of Environmental Science and Engineering, at Shanghai Jiao Tong University (SJTU), one of the oldest and most prestigious universities in China.

Application to this site is restricted to Chemical Engineering and Environmental Engineering majors.

PROGRAMS IN LATIN AMERICA

COSTA RICA PROJECT CENTER – IQP

Director: Prof. Melissa Belz, Project Center, 210A

Costa Rica is a land of contrast: banana plantations, flaming volcanoes, misty black sand beaches, and a thriving modern capitalist economy. A remarkably stable country, both politically and economically, Costa Rica offers an opportunity for students to become immersed in a Central American culture where democracy, economic development, and concern for the environment are a permanent part of the landscape. Students stay in the capital city of San José and have ample opportunity to visit the country’s many attractions.

Projects are typically centered on issues in environmental conservation, sustainable development, and community development. Students work with government agencies, selected museums, and private organizations dedicated to these issues. Through project work students become familiar with the land and with the challenges involved in maintaining a clean environment in spite of pressures to develop the economy.

Prior knowledge of Spanish language is not required for participation. All students, however, must complete a two-week intensive language program on site. Those who already have Spanish skills will greatly improve them.

ECUADOR PROJECT CENTER – IQP

Director: Laureen Elgert, Salisbury Laboratories, 310

Cuenca, Ecuador is a modern city in the Andes mountains in southern part of Ecuador. It is located in a valley at approximate 8,400’ above sea level. Cuenca is a UNESCO World Heritage Trust site that is exemplified by the historical central district. The climate in Cuenca is moderate. Days are generally warm and nights are cool enough that sweaters or jackets are needed. A heavier jacket may be needed for hiking in the mountains, while summer wear is appropriate for weekends at the beach. Since Cuenca is just a couple of hundred miles from the equator, there is only a 20 minute difference in daylight between the longest and shortest days of the year.

There are three universities in Cuenca, the most prominent are the Universidad de Cuenca and Universidad del Azuay. Cuenca has been called “the Athens of Ecuador” due to an abundance of museums, galleries, concerts, and other cultural highlights. Most of these are free, with others costing just a couple of dollars.

Students working at the Cuenca center will enjoy interaction with students from the universities, resident Cuencaños, and people from indigenous communities. Ecuadorians are extremely warm, friendly people who make all visitors feel welcome.

While you will mainly walk around the city, there is ample public transportation in Cuenca, including a new light rail that runs from end-to-end through the city. Busses cost $0.25 and a taxi will usually cost around $2.00. Intercity busses provide inexpensive, safe transportation to other parts of Ecuador. The airport in Cuenca has relatively inexpensive flights to other Ecuador cities.
Students will work on projects sponsored by local nonprofit organizations, public city companies that manage transportation, water, and other major needs. There are opportunities working on environmental projects in the Cajas National Park, a UNESCO World Heritage site. Other projects may be sponsored by private service organizations, like the Rotary Club, non-government organizations who are working to improve the conditions for poor Ecuadoreans and indigenous communities, and public and private museums.

**PANAMA PROJECT CENTER – MQP**

Co-Directors: Aaron Sakulich, Kaven Hall 209C  
Laureen Elgert, Salisbury Laboratories 310

The Republic of Panama forms a link between Central and South America, constituting an isthmus 60 miles wide at its narrowest point. The country has over three million residents, with one-third living in the capital, Panama City.

World-famous for the engineering marvel of the Panama Canal, Panama City is the most cosmopolitan capital in Central America. It has seen significant growth and is known for international shipping and banking, transportation, insurance, warehousing, and sales. The combination of colonial ruins, modern high-rise office buildings, luxury homes, and squatters’ slums reflects the blend of cultures, eras, and economic levels that are found in the city.

Panama City has numerous tourist attractions, including Panamá la Vieja (the ruins of the original city), Casco Viejo (the Old Quarter), museums, and national parks. The country has a tropical maritime climate, with an average daily high temperature of 87°F.

IQP Projects at the Panama Project Center, which were first offered in 2015, involve a variety of governmental and non-governmental partners.

**PARAGUAY PROJECT CENTER – IQP**

Director: Prof. R. Traver, CC 209

Paraguay, located between Argentina, Bolivia and Brazil, is a beautiful country, served by two major rivers and comprised of several distinct natural regions. It is world famous for its bird life, and the mighty jaguar and feared anaconda, as well as many other beautiful and interesting creatures, call Paraguay home. Interestingly, the country’s culture and society represent a blend of both indigenous and colonizer influences, a dual inheritance that manifests in its unique commitment in South America to two official languages, Guaraní and Spanish. With only seven million people, Paraguay is small. But it has a robust economy based on remarkable agricultural production. Unfortunately, that wealth ensures a high standard of living for a small percent of the population, and poverty is wide-spread.

Student projects, to date, focus on poverty elimination efforts sponsored by Fundación Paraguaya. Fundación Paraguaya is an NGO, based in Asunción, and led by Martin Burt, an internationally acclaimed social entrepreneur and member of the WPI faculty. Specifically, student teams find themselves in the workshops, fields, homes, schools and wherever else poor people live and work, and in the offices of the Fundación itself, where staff and electronic resources are available to help document, diagnose, address and assess the poverty elimination effort.

Many projects involve field work with poverty elimination social workers or cost analysis of self-sufficient programs such as cheese manufacture and the improvement of green energy sources at the San Francisco School. Future projects will continue these efforts and likely include program analysis for Paraguay’s Habitat for Humanity and traffic management analysis for the City of Asunción.

**PUERTO RICO PROJECT CENTER – IQP**

Director: Prof. L. Matthews, Life Sciences & Bioengineering Center, 4006

The Puerto Rico Project Center offers an opportunity to be immersed in a Caribbean culture that is a unique and harmonious blend of Spanish and North American influences found nowhere else in the world. Located in San Juan, the Center offers the attractions of a large metropolitan area within easy reach of El Yunque National Park, white sand beaches, the historic El Morro Spanish fortress, Arecibo Observatory, and many other sites of interest.

Projects are completed in teams and focus on issues related to sustainability, including specific challenges in the areas of the environment, community development, public health and housing, transportation, and land use and agricultural development. Sponsoring agencies have included Commonwealth and federal governmental agencies, non-governmental organizations, and private sector businesses. Projects offer students the opportunity to make meaningful changes in the area of sustainable development in this thriving and dynamic island.

**PROGRAMS IN THE SOUTH PACIFIC**

**AUSTRALIA PROJECT CENTER – IQP**

Director: Prof. H. Ault, Higgins Laboratories, 208

Melbourne is the second largest city in Australia and the capital of the state of Victoria. Located on Australia’s southeast coast, the seaside city offers a rich array of culture, history, and entertainment. Melbourne has consistently been voted as “the world’s most livable city,” and it’s easy to see why—the city is immersed in a Caribbean culture that is a unique and harmonious blend of Spanish and North American influences found nowhere else in the world. Located in San Juan, the Center offers the attractions of a large metropolitan area within easy reach of El Yunque National Park, white sand beaches, the historic El Morro Spanish fortress, Arecibo Observatory, and many other sites of interest.

Projects are completed in teams and focus on issues related to sustainability, including specific challenges in the areas of the environment, community development, public health and housing, transportation, and land use and agricultural development. Sponsoring agencies have included Commonwealth and federal governmental agencies, non-governmental organizations, and private sector businesses. Projects offer students the opportunity to make meaningful changes in the area of sustainable development in this thriving and dynamic island.
NEW ZEALAND PROJECT CENTER – IQP

Director: Prof. M. Elmes, Washburn Shops, 203
Co-Director: Prof. I. Shockey, Project Center, 209

Since 2013 the New Zealand Project Center has introduced WPI students to challenging problems at the intersection of science, technology, and society on topics such as wildlife-human interaction, awareness of tsunamis, technological innovation, flood control and climate change, diabetes awareness, and Maori history and development. Located in New Zealand’s capital, Wellington, “the coolest little capital in the world” (Lonely Planet), the New Zealand Project Center has built close ties to a number of high-level government, quasi-government, and charitable organizations in Wellington and, with the help of many sponsors, has designed projects that engage and challenge our students.

The metropolitan population of Wellington is about 390,000. The city is located on Wellington Harbour on the southwestern tip of the North Island, between the Cook Strait and the Rimutaka Range. It serves as the capital of New Zealand and is home to Parliament, the head offices of most government ministries and departments, and most foreign diplomatic missions. It is also a cultural center with many museums (including Te Papa Tongarewa, the Museum of New Zealand), a vibrant film and theater industry, symphony and ballet companies, and the biennial New Zealand International Arts Festival. Wellington is also the home of the New Zealand movie industry with Peter Jackson, James Cameron and Weta Workshop nearby.

The Wellington Region and New Zealand as a whole are great places to explore with access to forests, mountains, and oceans and opportunities for hiking, biking, nature exploration, and kayaking in evenings or on weekends. It is also a vibrant bicultural country where New Zealanders of European decent, Maori, and other immigrant groups live and work together. On the recent Good Country Index, New Zealand ranked 5th in the world on the basis of low levels air and water pollution, significant educational and infrastructure investments in science and technology, and high levels of health and well-being.

ISRP PROCESS DEADLINES

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Consult the Global Portal at www.wpi.edu/+globalportal for ISRP Process Deadlines

Please contact IGSD at global@wpi.edu with any questions about the ISRP process.
INDIVIDUALLY SPONSORED ON-CAMPUS IQP PROGRAMS

CENTER FOR FINANCIAL ENGINEERING

Co-Directors, Professor Hossein Hakim (Atwater Kent 231) and Professor Michael J. Radzicki (Salisbury Labs 310C)
The WPI Center for Financial Engineering offers IQPs & MQPs in the area of trading and investment system development. The goal of the Center is to empower students to understand the world of finance by teaching them how to build scientifically-based systems for trading and investing in today’s increasingly complex, technology-intensive, financial markets. The projects span the entire school year beginning in A term with a mandatory course that teaches the basics of trading and investment system development, an interdisciplinary area that integrates (at a minimum) current events with relevant portions of the disciplines of economics, finance, psychology, mathematics, statistics, data science and computer science. This course accounts for one half of WPI’s social science requirement and is followed by project work in B, C and D terms.

For their projects, students work in teams to scientifically develop several systems (a “system of systems”) to trade/invest a significant sum of money in a simulated trading account. To facilitate the development of their systems each student is given access to an actual commercial trading platform to back-test their ideas and execute simulated trades live in the market. Each student can select the asset class he/she wishes to trade (e.g., stocks, options, exchange traded funds, futures contracts, currency pairs), the time frame over which he/she wishes to trade (e.g., long-term investing, mid-term swing trading, day trading), the market type/situation he/she wishes to exploit (e.g., trending, volatile, directionless, market openings), and the “style” he/she wishes to follow (e.g., value investing, growth investing, manual trading, algorithmic trading). Students must also determine how to integrate their systems with those of their teammates and decide how to measure the relative effectiveness of the systems and allocate financial resources among them. For more information contact either Professor Hakim (hakim@wpi.edu) or Professor Radzicki (mjradz@wpi.edu).

CENTER FOR SUSTAINABLE FOOD SYSTEMS

Prof. R. Hersh, Project Center

Responses to food insecurity usually focus on the individual and household level through food assistance and social welfare programs. By contrast, community food security emphasizes access to and availability of food at the community level, local/ regional food systems within a sustainable global continuum, and greater food self-reliance.

In this set of on-campus IQPs students will work collaboratively with community groups, public health agencies, farmers, ecological designers, and organizations involved in regional food planning to: 1) improve access to healthy food in low income and minority neighborhoods in central Massachusetts and regionally; 2) create closer links among food system activities (production, processing, distribution, consumption, waste disposal) 3) catalyze food business opportunities (e.g., urban farms, food processing, community kitchens, composting services) in these communities; and 4) collaborate with farmers on innovative designs for small scale food production (e.g., bioshelters, grain harvesters, vertical farms). For more information, please contact Prof. Robert Hersh (hersh@wpi.edu).

ENERGY SUSTAINABILITY PROJECT CENTER

Director, Professor John Orr, Atwater Kent 214

This center supports and helps to coordinate project work (both MQPs and IQPs) in all aspects of energy and across all areas of academic inquiry at WPI. The principles of sustainability, in both traditional and renewable forms of energy, will play important roles in all of the center’s activities. The center will provide resources to support these projects and to facilitate the organization of project teams with faculty advisors. Center activities include the following: communication of WPI’s activities in the energy area both internally and externally; establishment of a clearinghouse for project topics and the formation of project teams; organization of a forum for discussion of major energy-related topics, highlighting excellent energy-related projects; identifying externally-sponsored projects. For more information contact Prof. John Orr (orr@wpi.edu).

SUSTAINING WPI PROJECT CENTER

Director, Suzanne LePage, Kaven Hall 209A

Many activities are taking place to enhance the sustainability of the campus and of WPI as an institution. Most recent is the WPI Sustainability Plan, which addresses campus facilities, the educational curriculum, research and scholarship, as well as civic engagement. This center was developed to support and coordinate project work (both MQPs and IQPs) aimed at improving campus sustainability. The center identifies current project needs and provides support to the Administration, Faculty, Staff, and Students for a myriad of sustainability planning efforts. Center activities include the following: communication of WPI’s Sustainability Planning activities; establishment of a clearinghouse for project topics and the formation of project teams; organization of a forum for discussion of major energy-related topics, highlighting excellent energy-related projects; identifying externally-sponsored projects. For more information contact Suzanne LePage (slepage@wpi.edu).
OVERVIEW

The Humanities and Arts Requirement empowers students to meet the broad educational goals of WPI. The balance between technological and humanistic education and the emphasis on inquiry-based approaches to student learning have been and remain hallmarks of a WPI education. In concert with WPI’s other degree requirements, the Humanities and Arts Requirement embodies the institute’s definition of an educated person. The Humanities and Arts Requirement engages students with theory and practice – Lehr und Kunst – through the following educational goals.

GOALS OF THE HUMANITIES AND ARTS REQUIREMENT

- to introduce students to the breadth, diversity, and creativity of human experience as expressed in the humanities and arts;
- to develop students’ ability to think critically and independently about the world;
- to enhance students’ ability to communicate effectively with others in a spirit of openness and cooperation;
- to enrich students’ understanding of themselves;
- to deepen students’ ability to apply concepts and skills in a focused thematic area through sustained critical inquiry;
- to encourage students to reflect on their responsibilities to others in local, national and global communities;
- to kindle in students a life-long interest in the humanities and arts.

MEETING THE REQUIREMENT

Students fulfill the humanities and arts degree requirement by completing two units of work consisting of five student-selected courses followed by a 1/3 unit Inquiry Seminar or Practicum (HU 3900, HU 3910, or equivalent). In selecting the courses, students must complete depth and breadth components of the requirement, as described below. At the end of the Inquiry Seminar or Practicum, every student will submit a completion-of-degree requirement form (CDR) to certify completion of the requirement.

DEPTH COMPONENT:

The WPI Plan calls for students to develop a meaningful grasp of a thematic area of the humanities and arts. To ensure this depth, students complete at least three courses of thematically-related work prior to a culminating Inquiry Seminar or Practicum in the same thematic area. Thematically-related work can be achieved in two ways:

1. Focusing on one of the following disciplines or disciplinary areas:
   - art/art history (AR)
   - music (MU)
   - drama/theatre (EN/TH)
   - literature and writing/rhetoric (EN, WR, RH)
   - history and international and global studies (HI, HU, INTL)
   - philosophy and religion (PY, RE)

2. Defining the thematic area across disciplines or disciplinary areas in consultation with a Humanities and Arts faculty member.

To ensure that students develop a program of increasing complexity, at least one of the three thematically-related courses that precede the Inquiry Seminar or Practicum must be at the 2000-level or above. Students are strongly encouraged but not required to include a 3000-level course within their depth component. The structure of the requirement remains flexible so that students will become intentional learners as they select a sequence of thematically-related courses.

BREADTH COMPONENT:

To ensure intellectual breadth, before taking the final Inquiry Seminar or Practicum, students must take at least one course outside the grouping in which they complete their depth component. To identify breadth, courses are grouped in the following manner:

- art/art history, drama/theatre, and music (AR, EN/TH, MU);
- languages (SP, GN, ISE, AB, CN);
- literature and writing/rhetoric (EN, WR, RH);
- history and international and global studies (HI, HU, INTL);
- philosophy and religion (PY, RE).

WPI offers a flexible curriculum to entrust students with a significant amount of choice and responsibility for planning their own course of study. At the same time, WPI requires students to take at least one course outside the depth area in order to provide exposure to more than one disciplinary approach within the arts and humanities, which include the creativity of the fine and performing arts, modes of communication in languages and literature, and the cultural analysis of the past and present. Students are encouraged to experiment and to take courses in more than one group outside the depth area if they wish. By providing exposure to multiple areas, the breadth component encourages students to appreciate the fundamental unity of knowledge and the interconnections between and among diverse disciplinary fields.

The one exception to this breadth requirement is that students may take all six courses in a foreign language.

DEPTH AND BREADTH COMPONENTS IN FOREIGN LANGUAGES:

Development of proficiency in a language necessitates sustained engagement in the language beyond the elementary and intermediate level. Language instruction is broadly interdisciplinary and includes elements of the history, literature, and culture of a particular language area. A student in languages must still meet the depth component of the requirement by taking 6 courses in the language, one of which is approved as the final Inquiry Practicum or Seminar. Additional information about options for the Inquiry Practicum or Seminar in Chinese (CN), English for Non-Native speakers (ISE), German (GN) and Spanish (SP) can be found later in this section. A student who begins language study is not compelled to remain in that subject, but could choose to switch to another subject of study and complete the depth component in another thematic area.
INQUIRY SEMINAR OR PRACTICUM
The culmination of the depth component of the Humanities and Arts Requirement is an inquiry seminar or practicum. The educational goals for the seminar or practicum are the same regardless of the format.

OBJECTIVES OF THE INQUIRY SEMINAR OR PRACTICUM:

- **Critical inquiry**: to develop each student’s ability to apply concepts and skills learned in the humanities and arts, the seminar/practicum offers opportunities to engage in sustained critical inquiry, analysis, or problem-solving in a focused thematic area.

- **Research and investigation**: to engage students in research, discovery, creativity, or investigation, the seminar/practicum provides opportunities for students actively and critically to seek and evaluate new information and insights using multiple sources. These opportunities need not necessarily be research papers.

- **Communication and writing**: to develop each student’s ability to communicate effectively both orally and in writing, the seminar/practicum includes discussion of appropriate communications skills and provides opportunities to revise written work after receiving feedback from the instructor.

- **Intellectual independence**: to foster independence of thought, the seminar/practicum offers significant opportunities for individual, self-directed work.

- **Conversation and dialogue**: to promote individual reflection and the appreciation of diverse perspectives, the seminar/practicum consists of classroom activities other than traditional lecture to encourage discussion and collaborative learning in a spirit of openness, cooperation, and dialogue with peers. The thematic focus, structure, and assignments for each seminar or practicum are to be determined by each individual instructor to achieve these goals.

INQUIRY SEMINAR
The Inquiry Seminar, usually taken in the sophomore year, represents the culmination of the Humanities and Arts Requirement. The Seminar provides an opportunity for students to explore a particular topic or theme in the humanities in greater depth. The Seminar has two primary goals. The first is to foster independence of student thought, typically through some form of self-directed activity. The second is to encourage a cooperative, dialogic approach to inquiry, through open exchanges with peers in a small, intensive classroom setting (typically 12 students or fewer). Students learn how to frame questions in the context of a particular discipline or field of study, and to explore or investigate problems using methods appropriate to work in the humanities and arts.

As the student’s capstone experience in the humanities and arts, the Inquiry Seminar is intended to help students take their knowledge of the humanities to a higher level. The purpose of the Inquiry Seminar, therefore, is not to provide a broad survey or general introduction to a given discipline, but to provide a structured forum in which students might approach a specific humanities-related problem or theme at a deeper, more sustained level of intellectual engagement than would normally be possible within a traditional course setting. The pedagogical idea behind the Inquiry Seminar is that work in the humanities and arts is at once an intensely personal enterprise, in which the individual freely draws on her or his own particular interests, abilities, passions, and commitments, and at the same time a form of ethical community in which the practitioner is always in conversation with and accountable to others.

While the specific content and requirements of the Inquiry Seminar vary from instructor to instructor, all Inquiry Seminars incorporate self-directed learning as a significant part of the curriculum. It is the department’s expectation, therefore, that by the time they enroll in the Seminar, students should have sufficient background in the humanities and arts to be able to work independently and to pose questions of their own. Students will be asked to research and write a term paper, to assemble a portfolio of writings or exercises, or otherwise to demonstrate their ability to pose a question of relevance to humanities inquiry, and to answer it. At the same time, the Seminars are designed to foster an atmosphere of intellectual collaboration and discovery. Students are required to participate fully in seminar discussion, to share the results of their own research or activities, and to engage the ideas and interests of their peers in a constructive and collegial way.

INQUIRY PRACTICUM
Students in the performing arts have the option to complete their Humanities and Arts sequence with an Inquiry Practicum in music or drama/theatre. A practicum shares the same goals and objectives of an inquiry seminar but provides students with a production/performance experience which emphasizes the hands-on, practical application of skills and knowledge gained from previous Humanities and Arts courses. Samples of practicums in music include composing, arranging, or performing a solo recital. Drama/Theatre students may choose to act, direct, or design for a campus production. In addition to weekly meetings, students may be required to attend rehearsals and performances. The design of the final project is determined through conversations between instructors and students. Due to the unique nature of the practicum, permission of the instructor is required to enroll in a practicum.

LANGUAGES: PRACTICUM OR SEMINAR
Students in languages may complete the Humanities and Arts Requirement in one of the following three ways:

1. **Practicum in the sixth and final course in a language**. The practicum will include evaluative components or exams to demonstrate overall language skills in four areas: listening, speaking, reading, and writing. The practicum will require students to demonstrate breadth of cultural knowledge of the language area. (Examples of practicum courses: CN 2544, CN 3544, GN 3512, GN 3515; SP 3522; SP 3527)

2. **Advanced language seminar after five previous courses in the language**. The seminar will explore a thematic topic and provide opportunities for individual inquiry. (Seminar examples: GN 3513, GN 3514; SP 3523, SP 3524, SP 3525, SP 3526, SP 3528, SP 3529, SP 3530, SP 3531)
3. **Advanced language seminar after advanced-level language courses combined with courses from other areas of study.**

   Students who demonstrate basic oral, written, and cultural knowledge of a language in a placement test at the advanced level may combine courses from other areas for their requirement. (Seminar examples are the same as option 2.)

   International students who are non-native speakers may take a combination of ISE and WR courses and fulfill the HUA requirement by taking a 3000-level or above ISE/WR project-based course.

   Option 1 and 2 require students to take six courses in a language. For example, in option 1, a student without prior language training might begin with GN 1511 Elementary German I and conclude with a practicum in GN 3512 Advanced German II. In option 2, for example, a student might start with SP 2521 Intermediate Spanish I followed by five Spanish courses which culminate in one of the designated seminars. In option 3, students who demonstrate knowledge of the language at the advanced level may mix courses from other areas in their course sequence. For example, a student might take two courses from history, philosophy, music, etc. along with four advanced Spanish courses which would culminate in a designated seminar. Students in the English language track might begin with three ISE courses, take one WR course, one from history, and conclude with a 3000-level ISE/WR course. Students in all three options for languages would be required to submit the same materials to demonstrate completion of the requirement as students whose culminating experience was an inquiry seminar or practicum in another area of the Humanities and Arts.

**HUA FACULTY ARRANGED BY DISCIPLINARY GROUP**

**Art/Art History (AR)**
- Joseph Farbrook (AR)
- Joshua Rosenstock (AR)
- David Samson (AR)

**Music (MU)**
- Scott Barton (MU)
- Fred Bianchi (MU)
- Richard Falco (MU)
- V.J. Manzo (MU)
- Eunmi Shim (MU)
- Douglas Weeks (MU)

**Drama/Theatre (TH)**
- Erika Hanlan (TH)
- Susan Vick (TH)

**Languages (AB, CN, GN, SP)**
- Mohamed Brahimi (AB)
- Esther Boucher-Yip (ISE))
- Ulrike Brisson (GN)
- Aarti S. Madan (SP)
- Ingrid Matos-Nin (SP)
- Angel Rivera (SP)
- Xin Xin (CN)
- Huili Zeng (CN)

**Literature/Writing (EN, ISE, WR)**
- Alexandria Agloro (EN, WR)
- Esther Boucher-Yip (EN, ISE)
- Kristin Boudreau (EN)
- Joel Brattin (EN)
- Jim Cocola (EN)
- Jennifer deWinter (WR)
- Michelle Ephraim (EN)
- Brenton Faber (WR)
- Erika Hanlan (EN)
- Lorraine Higgins (WR)
- Kent Ljungquist (EN)
- Ryan Smith Madan (WR)
- Wesley Mott (EN)
- Svetlana Nikitina (EN, HI, HU)
- Lance Schachterle (EN)
- Ruth Smith (WR)
- Susan Vick (EN)

**History/International and Global Studies (HI, HU, INTL)**
- Bland Addison (HI, INTL)
- William Baller (HI, INTL)
- Steven Bullock (HI)
- Constance Clark (HI)
- Joseph Cullon (HI)
- James Hanlan (HI)
- Peter Hansen (HI, INTL)
- Thomas Robertson (HI, INTL)
- Jennifer Rudolph (HI, INTL)
- David Spanagel (HI)

**Philosophy/Religion (PY, RE)**
- Bethel Eddy (PY, RE)
- Roger Gottlieb (PY, RE)
- Jennifer McWeeny (PY)
- Geoff Pfeifer (PY, RE)
- John Sanbonmatsu (PY)
- Ruth Smith (PY, RE)

**AP CREDIT POLICY**

The Humanities and Arts Department will accept a maximum of 1/3 unit of AP credit towards the Humanities and Arts requirement. Students who score a 4 or 5 on the AP test in German or Spanish automatically receive 1/3 unit of credit in the language, provided they do not begin German or Spanish study at WPI with Elementary German I (GN 1511) or Elementary Spanish II (SP 1523). Students who score a 4 or 5 on the AP test in studio art may be eligible for HUA credit, subject to a portfolio review by art faculty. Students who score a 4 or 5 on the AP test in other subject areas of the humanities and arts will receive credit in the relevant discipline. AP credit beyond one course (1/3 unit) in the Humanities and Arts may be counted toward other requirements such as free elective credit or particular majors and minors at WPI.

**TRANSFER STUDENTS AND THE HUMANITIES AND ARTS REQUIREMENT**

Students who transfer fewer than six Humanities and Arts courses from another institution must complete an inquiry seminar or practicum to complete the Humanities and Arts Requirement. Students who transfer six or more courses in
Humanities and Arts will have the option of submitting a CDR form or engaging in additional work (or documentation of work) to earn an “A” on the CDR, in accordance with current transfer rules (see below).

All students may have the option of completing their Humanities and Arts Requirement while enrolled for 1 unit of coursework at an off-campus project center where one-third unit of the coursework shall include an inquiry seminar or practicum.

Transfer credit in the Humanities and Arts at WPI is granted on a course-for-course basis. All Transfer students entering WPI with fewer than six courses or their equivalent of transfer credit in the Humanities and Arts must complete work in the Humanities and Arts, including an Inquiry Seminar/Practicum to the extent that the overall Humanities and Arts credit totals two units.

No credit toward the Humanities and Arts Requirement is given for introductory-level foreign-language courses unless the entire program is in that foreign language. Usually only one transfer course in Freshman English can be applied toward the requirement. In all cases, the professor for the Inquiry Seminar/Practicum has the final decision on what courses are acceptable within the student’s sequence leading up to the project. Up to one unit (i.e. three courses) of transferred work in the Humanities and Arts that is not credited toward the Humanities and Arts Requirement can be credited toward the fifteen-unit graduation requirement; such courses shall receive credit under the category of EL 1000.

If a Transfer student has completed two units of acceptable college-level work in the Humanities and Arts prior to entering WPI, a Completion of Degree Requirement form will be submitted by the Humanities and Arts Department Coordinator for Transfer Students at the request of the student. The grade for such a Humanities and Arts Requirement met by transfer credit is normally a grade of “CR”. Students whose grades on transferred courses average A can engage in additional work or submit samples of their previous work and may be awarded an A for the Humanities and Arts Requirement. Alternately a transfer student may elect to undertake an Inquiry Seminar/Practicum in an effort to achieve an A grade. These evaluation options must be exercised prior to the Department’s submission of the Completion of Degree Requirement form to the Registrar.

Decisions concerning credit toward the Humanities and Arts Requirement are made by the Humanities and Arts Coordinator for Transfer Students, Professor James Hanlan. He can be contacted in room 28 of Salisbury Laboratories, or at extension 5438, or email jhanlan@wpi.edu.

GUIDELINES FOR GRANTING TRANSFER CREDIT TO U.S. STUDENTS FOR FOREIGN LANGUAGE STUDY

A. Credit for study on the high school level:

1. Transfer credit of 1/3 unit is given for Advanced Placement with a score of 4 or 5.
2. Students with three or more years of foreign-language study in high school, but who have not taken the Advanced Placement examination in that language, may receive 1/3 unit credit for their high school language study upon satisfactory completion of two courses in the same language on the intermediate level or above. (Note:

B. Credit for study at other colleges and universities:

1. Language study which is done at other universities and colleges prior to entering WPI, or done with the prior written permission of the student’s Humanities and Arts Consultant (not the Department Head) as part of an agreed-upon Humanities and Arts sequence, transfers on a course-for-course basis.
2. Language study which is done at foreign universities, language institutes, cultural institutes, etc., prior to entering WPI, or done with the prior written permission of the student’s Humanities and Arts Consultant (not the Department Head) as part of an agreed-upon Humanities and Arts sequence, is assessed by the Foreign Languages Consultant on the basis of matriculation papers and the level of work accomplished.

OTHER OPTIONS

INTERDISCIPLINARY STUDY AT THE AMERICAN ANTIQUARIAN SOCIETY

A unique opportunity for interdisciplinary work in the humanities and arts is offered by the American Studies Seminar sponsored each fall by the American Antiquarian Society. Organized in collaboration with Worcester’s five undergraduate colleges and universities, this seminar focuses on topics that allow students to investigate the Society’s rich holdings in early American history, literature, and culture. The Society’s unparalleled collection of documents is a short walk from the campus. Information on application deadlines and academic credit toward the Humanities and Arts Requirement is available from the WPI Campus Representative to the American Antiquarian Society.

OFF-CAMPUS HUMANITIES AND ARTS OPTION

WPI offers the option to complete the Humanities and Arts Requirement during one term of study at several Project Centers. Normally, students complete the requirement through at least six courses or independent-study projects on campus. However, the “Off-Campus” option allows students to combine at least three courses on campus with one term studying the humanities and arts at a Project Center. Since this one-term project is equivalent to three courses, students may use it to complete the requirement.

Off-campus projects are available in Germany for the study of foreign languages and in London and Morocco for other fields. These off-campus programs have a flexible format. Students devote themselves to one term studying the history, literature, language or culture at the project site with a WPI faculty advisor. The program might combine a thematic seminar in an area of the faculty advisor’s expertise with visits to museums, the theatre, musical performances, or cultural excursions.
Although themes or areas of emphasis vary from year to year, all off-campus Humanities and Arts activities culminate in a written report in an area of interest to the student.

To be eligible for this one-unit activity, students must have already completed three courses in humanities and arts before they leave campus. Students may apply to the off-campus program before they have taken all three courses. However, students may not participate in the program unless they successfully complete one unit of work in humanities and arts before the term of the project. In addition, students going to any Project Center must complete all of the forms required by the Interdisciplinary and Global Studies Division.

Requirements:

• Students must have completed at least three courses in the Humanities and Arts at WPI, or have earned equivalent course credit approved by the Humanities and Arts Department, before the term of the off-campus activity. The Department may allow students to count transfer or advanced placement credits toward the three course minimum;

• Students must be accepted into the off-campus Humanities and Arts program by the Humanities and Arts Department, and complete all forms required by the Interdisciplinary and Global Studies Division, in order to register for these projects.

• Students might be required by the faculty advisor to complete a PQP or attend required meetings before the off-campus project;

• Students must submit a written report or paper at the end of the project. Students also may be required to submit written updates at various times in the course of the project. In all cases, the faculty advisor at the project site will determine the precise form of the written requirements.

• Students may be required to give an oral presentation at the end of the project;

• Under normal circumstances, students must complete the project within one term in order to receive the full unit of credit;

• Only members of the Humanities and Arts faculty at WPI may advise off-campus Humanities and Arts projects.

OFF-CAMPUS RECOMMENDATIONS

All off-campus programs benefit from advance planning. Discuss the possibility of an off-campus activity with your academic advisor at the beginning of the freshman year. Consult with the WPI faculty who will advise these off-campus projects as early as possible, since they may be able to suggest useful courses or other background resources for the projects. Also keep in mind that three courses are the minimum required, but many students find it advantageous to take additional courses before going away.

The interdisciplinary London and Morocco programs are open to students with a background in areas of the humanities and arts besides foreign languages, including art history and architecture, drama/theatre, history, literature, music, philosophy, religion, or writing/rhetoric. After taking at least three courses in any of these areas on campus, you could then go to London to complete your project. Some students also have gone to London with this program to study beyond the Humanities and Arts Requirement for international and global studies, history, literature, music, theatre, or other areas.

WPI offers programs in the German language at Darmstadt. This program requires completion of foreign language courses through the level of intermediate II or above (2000-level or above) before going abroad. For students who have taken foreign language courses in high school, language placement exams are available during New Student Orientation. Some students with basic foreign language preparation have completed their arts projects in Germany. We welcome a creative approach to off-campus study.

More advanced students may participate in these off-campus programs by doing work toward a minor or major. A student who had already completed their Humanities and Arts Requirement on campus, for example, might be able to work in the humanities and arts on an Independent Study Project that could count toward a minor. Or a student at one of these sites could work on a Major Qualifying Project in fields such as Humanities and Arts, International and Global Studies, or Professional Writing.

The Humanities and Arts Department advertises upcoming project locations and application deadlines at the Global Opportunities Fair each September. Future project opportunities might include other foreign locations or projects that provide the context for an intensive study of humanistic themes associated with particular locales within the United States. Contact the Department of Humanities and Arts for more information.
Social science deals with the behavior of individuals and groups as well as the functioning of the economic and political systems and institutions that shape and control our lives. As such, it offers a perspective that is essential for anyone desiring a well-rounded education.

Therefore, WPI, in common with other colleges, requires some exposure to the social sciences for its graduates. In satisfying the two-course social science requirement, students are free to take courses in any of the traditional social sciences: economics, political science, sociology, and psychology. Courses with the following prefixes may be counted toward the social science requirement: ECON, ENV, GOV, PSY, SD, SOC, SS, STS. The social science courses offered at WPI are grouped into two broad categories. The first consists of core courses that introduce students to the social sciences and help them understand the scope and limits of social science approaches and how they might be related to the design of Interactive Qualifying Projects. The second, more advanced, set of courses looks in depth at particular issues and problems, providing students with a more detailed understanding of social science disciplines and their use in social problem solving and interactive projects.

To obtain maximum benefit from their study of social science, students should choose courses that will provide knowledge and skills relevant to their Interactive Qualifying Project. These courses should be taken prior to or concurrent with undertaking the IQP and should be selected, if possible, after the student has identified the general topic area in which his or her interactive project work will be carried out.

More information on the alternatives available and the factors that should be considered in choosing courses to satisfy the social science requirement are available on the Social Science and Policy Studies department website at www.wpi.edu/Academics/Depts/ssps.html.