



Institutional Self-Study

Worcester Polytechnic Institute • March 2012

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Institutional Characteristics Form

Date: **August 15, 2011**

1. Corporate name of institution: **Worcester Polytechnic Institute**
2. Date institution was chartered or authorized: **May 10, 1865**
3. Date institution enrolled first students in degree programs: **November 11, 1868**
4. Date institution awarded first degrees: **July 26, 1871**

5. Type of control:

Public

☐ State

☐ City

☐ Other

(Specify) _____

Private

☒ Independent, not-for-profit

☐ Religious Group

(Name of Church) _____

☐ Proprietary

☐ Other: (Specify) _____

6. By what agency is the institution legally authorized to provide a program of education beyond high school, and what degrees is it authorized to grant?

Commonwealth of Massachusetts; Bachelors, Masters, and Doctoral degrees

7. Level of postsecondary offering (check all that apply)

☐ Less than one year of work

☐ At least one but less than two years

☒ Diploma or certificate programs of at least two but less than four years

☐ Associate degree granting program of at least two years

☒ Four- or five-year baccalaureate degree granting program

☒ First professional degree

☒ Master's and/or work beyond the first professional degree

☐ Work beyond the master's level but not at the doctoral level (e.g., Specialist in Education)

☒ A doctor of philosophy or equivalent degree

☐ Other doctoral programs _____

☐ Other (Specify) _____

8. Type of undergraduate programs (check all that apply)

- ☐ Occupational training at the crafts/clerical level (certificate or diploma)
 ☒ Liberal arts and general
- ☐ Occupational training at the technical or semi-professional level (degree)
 ☒ Teacher preparatory
- ☐ Two-year programs designed for full transfer to a baccalaureate degree
 ☒ Professional
- ☐ Other _____

9. The calendar system at the institution is:

- ☒ Semester
 ☐ Quarter
 ☐ Trimester
 ☒ Other: 7-week terms

Undergraduate courses use a 7-week term schedule while graduate courses use a semester schedule.

10. What constitutes the credit hour load for a full-time equivalent (FTE) student each semester?

- a) Undergraduate 18 credit hours
 b) Graduate 9 credit hours
 c) Professional 18 credit hours

11. Student population:

- a) Degree-seeking students (from October 2011 snapshot):

	Undergraduate	Graduate	Total
Full-time student headcount	3627	613	4240
Part-time student headcount	119	944	1063
FTE	3674	974	4648

- b) Number of students (headcount) in non-credit, short-term courses: N/A

(Writing for non-native speakers of English)

12. List all programs accredited by a nationally recognized, specialized accrediting agency.

Program	Agency	Accredited since	Last Reviewed	Next Review
Aerospace Engineering	ABET	2006	2009	2015
Biomedical Engineering	ABET	2003	2009	2015
Chemical Engineering	ABET	1942	2009	2015
Civil Engineering	ABET	1936	2009	2015

Computer Science	ABET	1986	2009	2015
Electrical & Computer Engineering	ABET	1936	2009	2015
Environmental Engineering	ABET	2006	2009	2015
Industrial Engineering	ABET	1996	2009	2015
Mechanical Engineering	ABET	1936	2009	2015
Robotics Engineering	ABET	2010	2010	2012
Business	AACSB	2003	2006	2012

13. Off-campus Locations. List all instructional locations other than the main campus. For each site, indicate whether the location offers full-degree programs or 50% or more of one or more degree programs. Record the full-time equivalent enrollment (FTE) for the most recent year. Add more rows as needed.

N/A

14. International Locations: For each overseas instructional location, indicate the name of the program, the location, and the headcount of students enrolled for the most recent year. An overseas instructional location is defined as “any overseas location of an institution, other than the main campus, at which the institution matriculates students to whom it offers any portion of a degree program or offers on-site instruction or instructional support for students enrolled in a predominantly or totally on-line program.”

N/A

15. Degrees and certificates offered 50% or more electronically: For each degree or Title IV-eligible certificate, indicate the level (certificate, associate’s, baccalaureate, master’s, professional, doctoral), the percentage of credits that may be completed on-line, and the FTE of matriculated students for the most recent year. Enter more rows as needed.

Name of program	Degree level	% on-line	FTE
Environmental Engineering	MS	50%	23.5
Fire Protection Engineering	MS	50%	150.0
Mechanical Engineering	MS	50%	415.9
System Dynamics	MS & Certificate	100%	3.7
Business Administration	MBA	50%	194.0
Information Technology	MS & Certificate	50%	86.3
Operations Design and Leadership	MS	50%	43.5
Marketing and Technological Innovation	MS	50%	105.8
Systems Engineering	MS & Certificate	50%	122.0
Information Security Management	Certificate	50%	0.0
Management of Technology	Certificate	50%	0.7

Note: The FTE students reported here are based on all credits delivered in the courses in the program, both on campus and on-line, and the FTE reported is 1/18 (using 18 credits to define full-time) of the credits delivered for the academic year. In all cases, except for System Dynamics, courses offered on campus have parallel on-line versions. In the last academic year, less than 7 percent of the credits delivered in graduate and certificate programs were for on-line students.

16. Instruction offered through contractual relationships: For each contractual relationship through which instruction is offered for a Title IV-eligible degree or certificate, indicate the name of the contractor, the location of instruction, the program name, and degree or certificate, and the number of credits that may be completed through the contractual relationship. Enter more rows as needed.

N/A

17. List by name and title the chief administrative officers of the institution. (Use the table on the following page.)

18. Supply a table of organization for the institution. (On following pages.)

19. Record briefly the central elements in the history of the institution:

Worcester Polytechnic Institute was incorporated under the name “Worcester County Free Institute for Industrial Sciences” under MGLA Ch. 180, Sec. 1-11 as an educational institution by an act of the Massachusetts Legislature on May 9, 1865. It was granted the power and authority to grant degrees “appropriate to the several courses of study pursued in said intuition” on March 3, 1870. On May 26, 1887, the Legislature endorsed the Institute’s change of name to its present title, Worcester Polytechnic Institute.

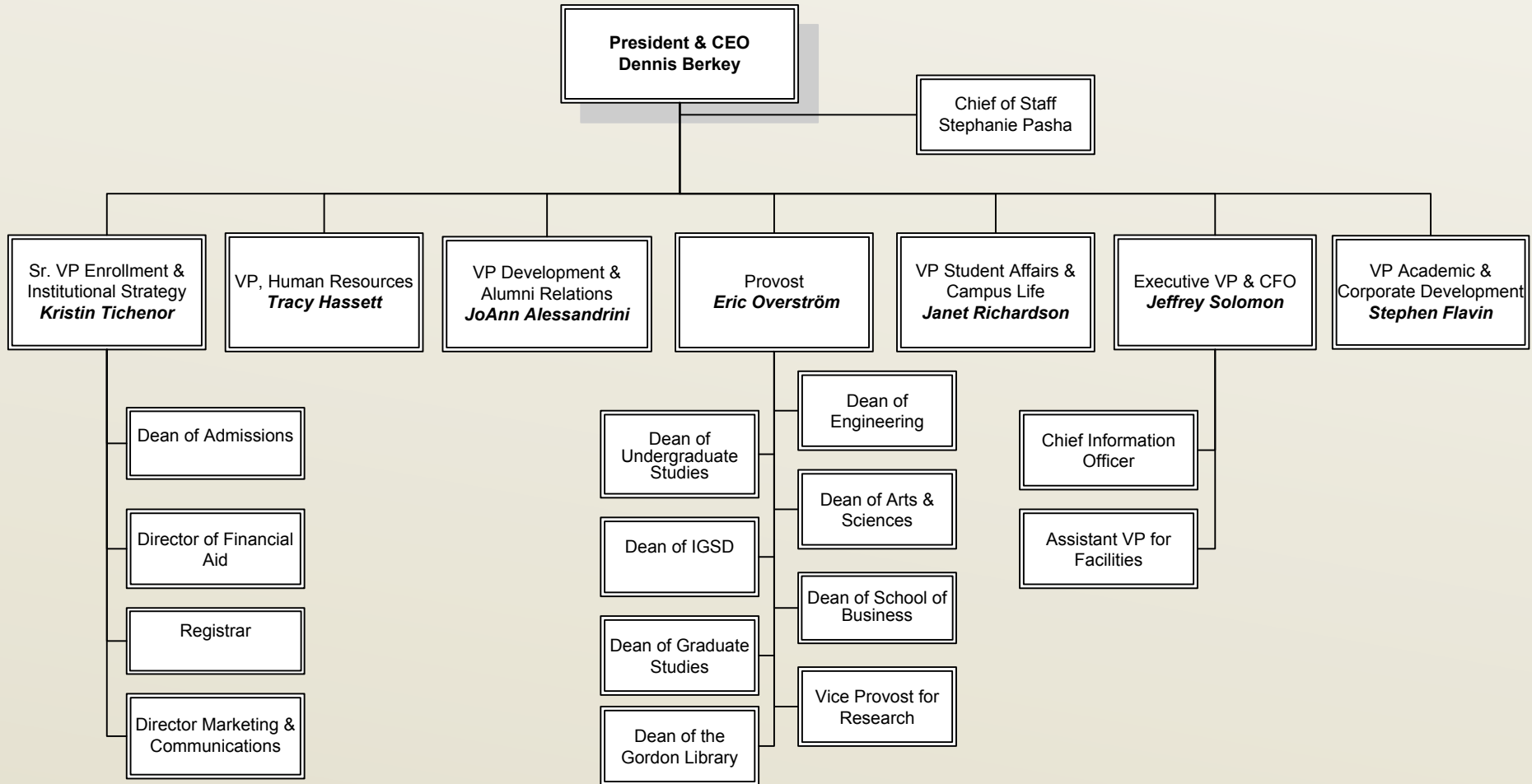
The first Bachelor of Science degrees were awarded in 1871 and the first graduate degrees were awarded 1898. A formal athletic program began in 1916 and the first dormitory was built in 1926, with fraternities providing the only campus-related housing prior to that time. Women undergraduates were first enrolled in 1968. WPI was first accredited by NEASC in 1937. The programs in civil, electrical, and mechanical engineering were accredited by the Accreditation Board for Engineering and Technology (ABET) in 1936, with chemical engineering added in 1942. The computer science program was first accredited by the Computer Science Accrediting Board in 1986. The program in management was accredited by the Association to Advance Collegiate Schools of Business (AACSB) in 2003. The first Bachelors of Arts degree was awarded in 2009. In 2010, WPI’s robotics engineering program became the first such program accredited by ABET in the United States.

CHIEF INSTITUTIONAL OFFICERS

<i>Function or Office</i>	<i>Name</i>	<i>Exact Title</i>	<i>Year of Hire</i>	<i>Year of Most Recent Appointment</i>
Chair Board of Trustees	Stephen Rubin	Chair Board of Trustees	N/A	2010
President/CEO	Dennis Berkey	President and CEO	2004	2004
Executive Vice President	Jeffrey Solomon	Executive Vice President and Chief Financial Officer	2005	2007
Chief Academic Officer	Eric Overström	Provost	2004	2011
Deans of Schools and Colleges	Selcuk Guceri	Dean of Engineering	2011	2011
	Karen Oates	Dean of Arts & Sciences	2010	2010
	Mark Rice	Dean of Business	2010	2010
Chief Financial Officer	Jeffrey Solomon	Executive Vice President and Chief Financial Officer	2005	2007
Chief Student Services Officer	Janet Richardson	VP, Student Affairs & Campus Life	1980	2004
Planning	Kristin Tichenor	Sr. VP, Enrollment & Institutional Strategy	2008	2010
Institutional Research	Melissa Leahy	Enrollment Analyst and Coordinator of Institutional Research	1997	2010
Assessment	Arthur Heinricher	Dean of Undergraduate Studies	1992	2008
Development	Jo-Ann Alessandrini	Interim VP for Development & Alumni Relations	2008	2011
Library	Tracey Leger-Hornby	Dean of Library Services	2008	2010
Chief Information Officer	Deborah Scott	Chief Information Officer	2010	2010
Corporate & Professional Education	Stephen Flavin	VP, Academic & Corporate Development	2005	2010

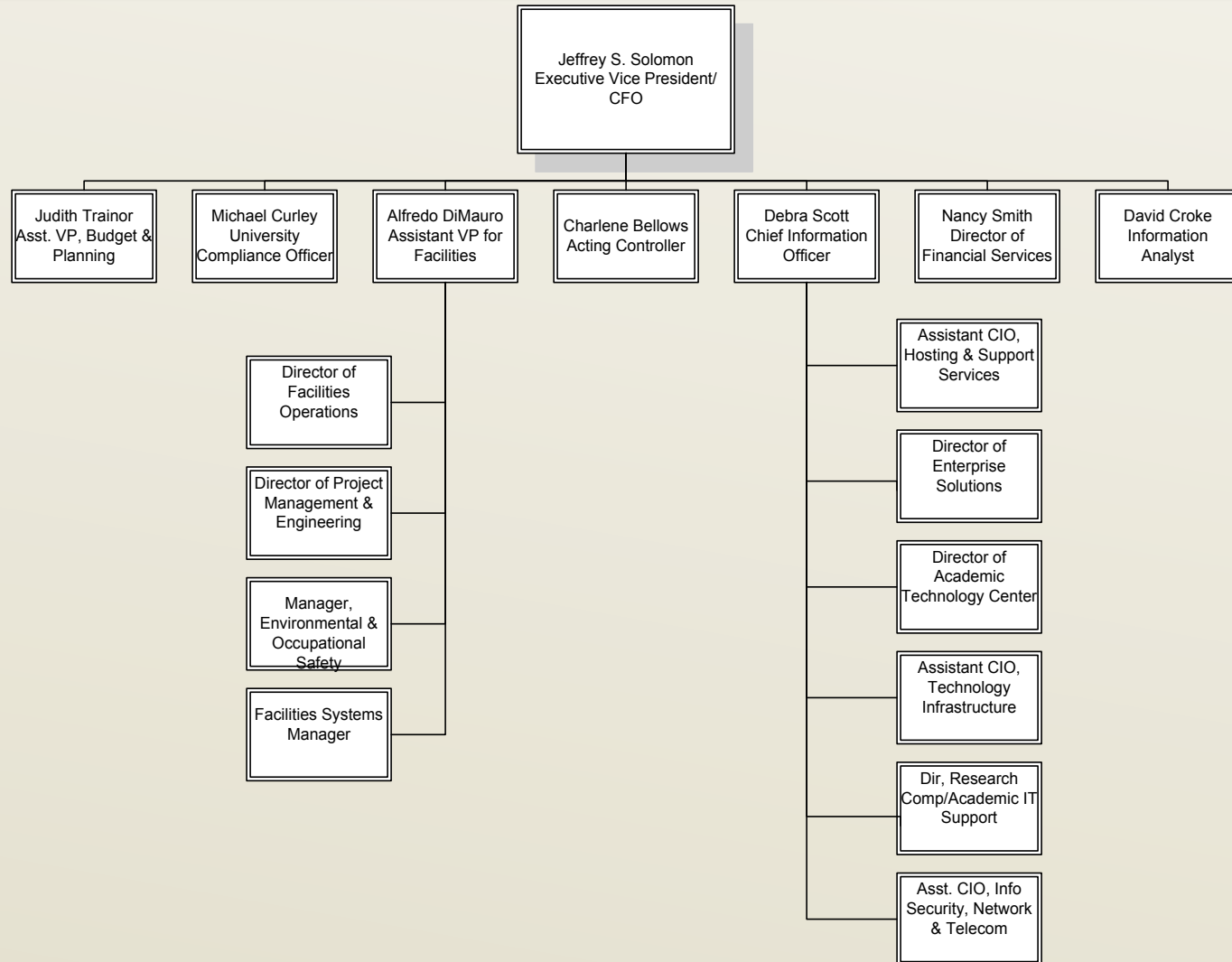
<i>Function or Office</i>	<i>Name</i>	<i>Exact Title</i>	<i>Year of Hire</i>	<i>Year of Most Recent Appointment</i>
Grants/Research	Michael Manning	Associate Provost for Research ad interim	2005	2010
Admissions	Ed Connor	Dean of Admissions	2001	2010
Registrar	Heather Jackson	Registrar	2010	2010
Financial Aid	Monica Blondin	Director of Financial Aid	1995	2005
Public Relations	Amy Morton	Executive Director of Marketing & Communications	2010	2011
Alumni Association	Jo-Ann Alessandrini	Interim VP for Development & Alumni Relations	2008	2011
Other	Richard Vaz	Dean of Interdisciplinary and Global Studies Division	1982	2006
	Richard Sisson	Dean of Graduate Studies	1982	2009
	Arthur Heinricher	Dean of Undergraduate Studies	1992	2008
	Philip Clay	Dean of Students	1993	2004
	Kristin Wobbe	Associate Dean of Undergraduate Studies	1995	2011
	Stephanie Pasha	Chief of Staff/Secretary of the Corporation	2004	2011

"DATA FIRST" FORMS						
GENERAL INFORMATION						
Institution Name:			Worcester Polytechnic Institute			
OPE ID:			00223300			
				Annual Audit		
				Certified:	Qualified	
Financial Results for Year Ending:			06/30	Yes/No	Unqualified	
Most Recent Year			2010	YES	Unqualified	
1 Year Prior			2009	YES	Unqualified	
2 Years Prior			2008	YES	Unqualified	
Budget / Plans						
Current Year			2011			
Next Year			2012			
Contact Person:			Arthur C. Heinricher			
Title:			Dean of Undergraduate Studies			
Telephone No:			508-831-5397			
E-mail address			heinrich@wpi.edu			



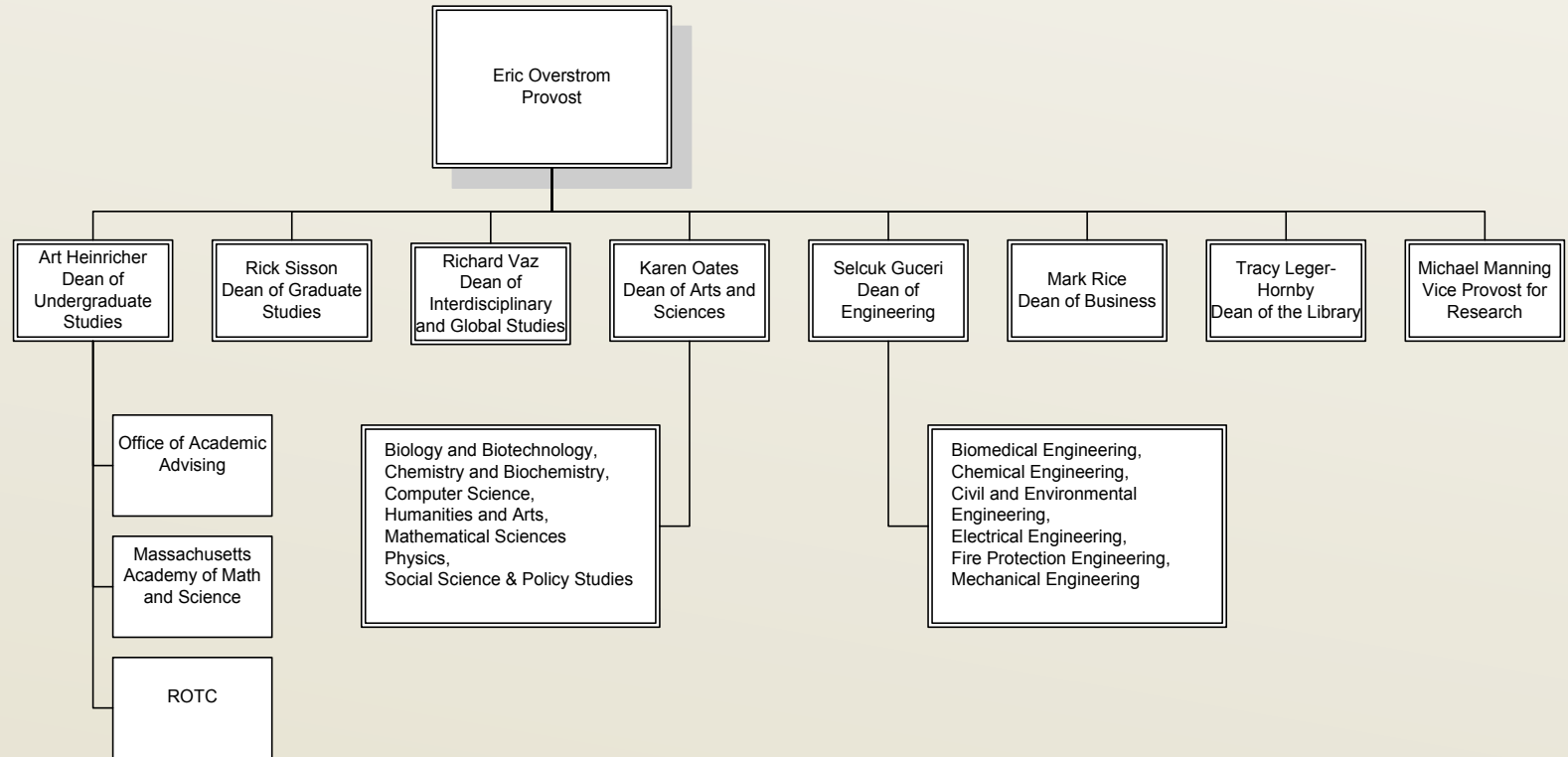


Finance and Operations



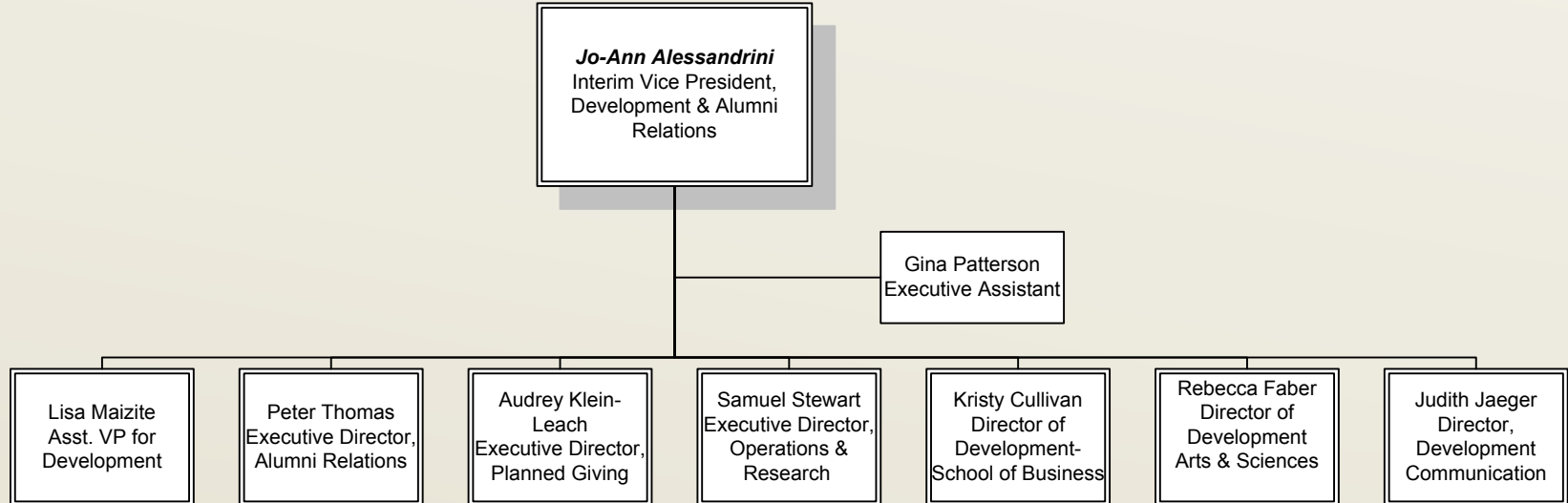


Academic Affairs

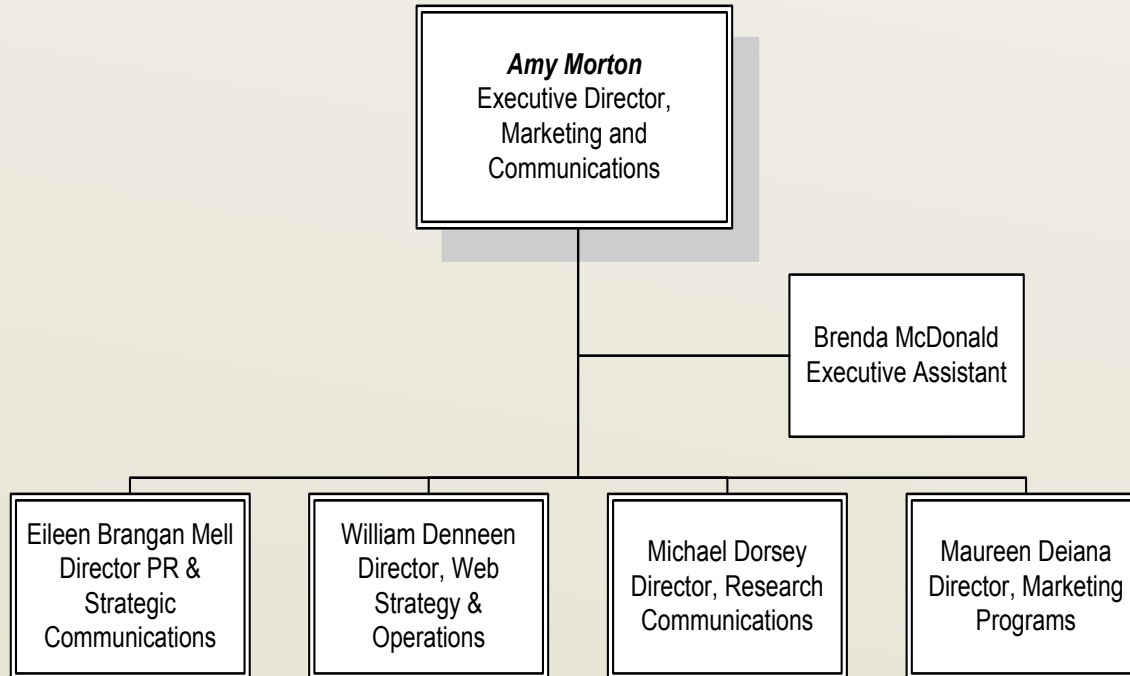




Development and Alumni Relations

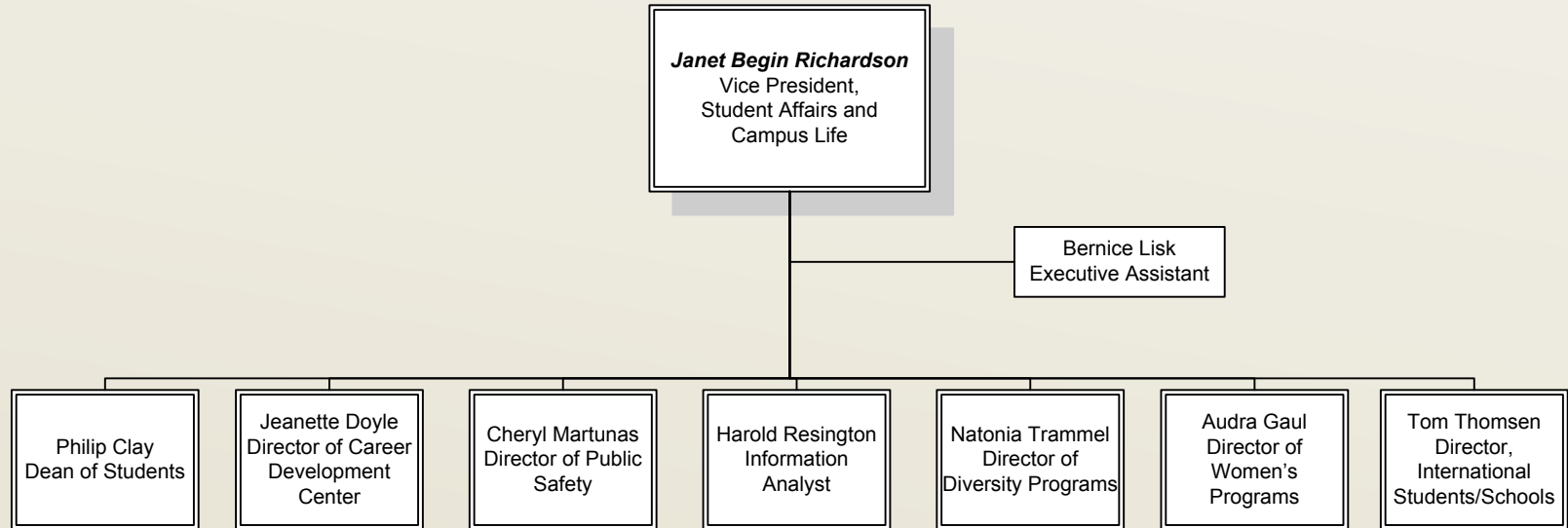


Marketing and Communications



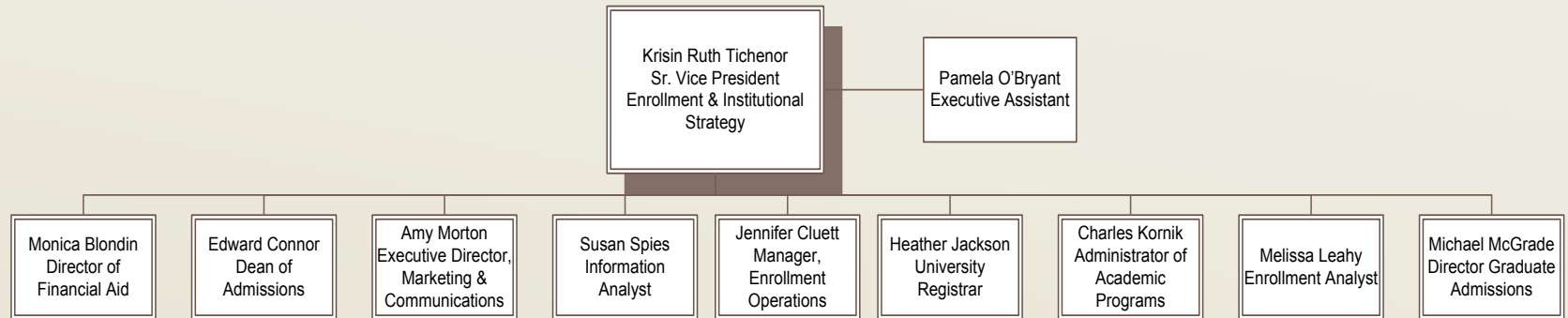


Student Affairs & Campus Life





Enrollment Management





Commonwealth of Massachusetts.

IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND SIXTY-five.

AN ACT

to incorporate the Worcester County Free Institute of Industrial Science.

Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows:

Section 1. George F. Hoar, Seth Sweetser, their associates and successors, are hereby made a body corporate, by the name of the Worcester County Free Institute of Industrial Science, for the purpose of establishing and maintaining in the city of Worcester, an institution to aid in the advancement, development and practical application of science, in connection with arts, agriculture, manufactures, mercantile business and such other kindred branches of practical education as said corporation shall determine; with all the powers and privileges, and subject to all the duties and

liabilities set forth in all laws which now are or may hereafter be in force and applicable to such corporations. The mayor of the city of Worcester, for the time being, shall ex officio, be a member of said corporation, and one member shall be appointed by the board of education. from time to time, as a vacancy may occur; and said corporation shall not consist of more than twelve members at any one time.

Section 2. Said corporation shall have authority to accept and hold in fee simple, or any less estate, any real or personal estate to an amount not exceeding four hundred and fifty thousand dollars, to be devoted exclusively to the purposes aforesaid and in conformity with conditions made by any donor, not inconsistent with this act, expressed by him in writing and recorded in the records of said institution.

Section 3. Said corporation may establish separate departments of scientific instruction and pursuit whenever it can be done

without interfering with the unity of purpose of said institution or the government and management of the same, may designate and distinguish such departments by specific names, and accept any moneys for the special advancement of said departments; provided that no moneys shall be applied to any uses or purposes, not embraced within the general design of said institution as expressed in this act.

House of Representatives. May 6. 1865.

Passed to be enacted. Alex. H. Bullock. Speaker.

In Senate. May 9. 1865.

Passed to be enacted. J. E. Field. President.

May 9th 1865. Approved.

John A. Andrew.

Secretary's Department.

Boston. May 10. 1865.

A true copy:-

Oliver Stannard.

Secretary of the
Commonwealth.

Introduction

This comprehensive self-study has provided an opportunity for administration, faculty, staff, and students to review all aspects of the Institute, to pause and reflect on a decade of growth both in the student population and in the complexity of the academic programs, and, as the university approaches its sesquicentennial, to look ahead and reaffirm our commitment to innovation and excellence in education. This internal review will be strengthened by an external evaluation and we look forward to benefitting from the perspective that the visiting committee will bring to our continuing discussions.

The formal preparation for the 2011 NEASC visit began in October 2009 when the Provost constituted the planning committee, with representation from each of WPI's divisions, and President Dennis Berkey formally charged this committee. The earliest work began with a review of data for the Data First forms included in each chapter of this self-study. Staff from the Career Development Center and the Enrollment Management Division collected the data for the Student Success Forms (the S-Series included in the Appendix). The Undergraduate Outcomes Assessment Committee, working with the academic department heads, collected the information for the E-series forms (E-1 and E-2, included in the Appendix).

Formal presentations regarding the accreditation process and the self-study were made throughout the 2010-11 academic year, with audiences including the Board of Trustees, senior leadership, the University Council (representing faculty and administration), the academic department heads, and the undergraduate Student Government Association.

The document began to take final shape in the spring of 2011. Some sections were drafted entirely by small groups of individuals in the appropriate divisions (Library, Information Technology, Finance, and Facilities). Work on Standard Six (Students) began with an email from the Dean of Students inviting all staff to provide their thoughts on the changes that have occurred and the challenges that have arisen over the past 10 years. Four faculty governance committees were asked to focus, specifically, on Standard Three (Governance), Standard Four (Academic Programs), and Standard Five (The Faculty).

The first complete draft of the self-study was shared with the president and division heads in the summer of 2011. In August 2011, the full report was posted on an internal website where all faculty, staff, and students were able to review and post comments and questions. The site registered almost 5,000 hits during the first fall term.

More than 50 faculty, staff, and administrators wrote significant parts of individual sections, provided and reviewed data for the report, and reviewed individual sections of the drafts. The following list includes the members of the Steering Committee as well as faculty, staff, and administrators who wrote and reviewed significant parts of the section or took leadership roles in the development of the final report.

Standard One: Mission and Purposes

Arthur Heinricher, Kristin Boudreau, Jo-Ann Alessandrini

Standard Two: Planning and Evaluation

Kristin Wobbe, Eric Overström, Stephen Flavin

Standard Three: Governance

Stephanie Pasha, Kristen Billiar

Standard Four: Academics

Arthur Heinricher, Kristin Boudreau, Kristin Wobbe, Richard Sisson, Richard Vaz, Stephen Flavin, Michael McGrade, Lance Schachterle

Standard Five: Faculty

Eric Overström, Chrysanthé Demetry, Kristin Wobbe

Standard Six: Students

Philip Clay, Edward Connors, Monica Blondin, Gregory Snoddy

Standard Seven: Library and Other Information Resources

Tracey Leger-Hornby, Deborah Scott, Mary Beth Harrity

Standard Eight: Physical and Technological Resources

Jeffrey Solomon, Alfredo DiMauro, Deborah Scott

Standard Nine: Finances

Jeffrey Solomon, Judith Trainor

Standard Ten: Public Disclosure

Amy Morton, William Denneen, Tracy Hassett, Michael Curley

Standard Eleven: Integrity

Tracy Hassett, Michael Curley

Institutional Overview

WPI received its charter from the Commonwealth of Massachusetts on May 10, 1865, and has deep roots in New England's industrial revolution. The Institute's founders were manufacturers and mechanics who sought to create a new type of school that would prepare professionals to meet the needs of a rapidly expanding industrial economy. But they also aspired to create an institution that would elevate the status of the professions in society. Toward those ends, they crafted an innovative approach to undergraduate education that promoted the integration of theory and practice (*Lehr und Kunst*), valued the humanities, and emphasized the responsibilities of the professional in a broader society.

Forty years ago, the focus that the founders placed on theory and practice was renewed and strengthened as the WPI faculty completely redefined the undergraduate program, a process that resulted in the creation of the WPI Plan. At the heart of this novel curriculum are three major projects: one in the major, to demonstrate mastery of the discipline; one focused on a problem at the intersection between technology and societal need, with additional emphasis on the student's ability to work on interdisciplinary teams and solve complex problems; and a third that serves as a capstone for a what is essentially a minor in the humanities and arts. The Plan placed much less emphasis on the courses a student had taken, and much more on what that student could actually do with the knowledge he or she had gained. In short, WPI defined a program where student learning outcomes were explicitly defined and assessed.

The WPI Plan is now 40 years old but still energetic and evolving. For example, the undergraduate program, with its emphasis on engineering and science, remains the heart of the institution, but it continues to evolve with new interdisciplinary majors and new programs in the humanities and arts, business, and the social sciences. And while the core tenets of the Plan remain intact, the program has regularly been the focus of institutional strategic planning and evaluation. One recent outcome of this systematic assessment was the introduction, in 2007, of the Great Problems Seminars, an interdisciplinary project-based course for first year students; we are now working to scale the program to meet student demand. We are also in the midst of the first assessment of the long-term impacts of our project-based curriculum (including input from alumni going back to the beginning of the Plan). Increasingly, undergraduate education at WPI is being integrated with the university's growing research and graduate programs. In fact, it is with pride that the faculty and administration describe WPI as “a medium-size research university with a premier undergraduate program.”

In reviewing our 2001 self-study and the report for the previous visiting committee, and in drafting the current document, it has become clear that the university has progressed considerably over the past decade. As you will learn in the pages that follow, WPI has grown in size and complexity; it has addressed fiscal challenges and weathered an economic downturn, emerging in robust financial health; and it has expanded its physical plant, for example, adding an admissions building that was on our wish list in 2001, starting construction of a recreation center that was only a dream then, and embarking on a substantial investment in life sciences research and education through the development of the Gateway Park campus and the creation of a life sciences teaching center.

Ten years ago we were concerned that applications to our undergraduate program had been flat for more than a decade. Since 2001, we have more than doubled the number of applications and increased the total undergraduate population from about 2,800 to more than 3,600 (while maintaining or improving every measure of student qualification). We have continued a commitment to building community and increased the diversity of the undergraduate population (from 23 percent women to over 30 percent; from under 4 percent Hispanic and African American to over 10 percent).

The growth of the undergraduate program has necessitated a variety of investments and improvements, from the construction of a residence hall, to the addition of multimedia classrooms, to the recruitment of more than 80 full-time faculty members over the past five years. We have addressed important issues relating to our graduate programs—for example, strengthening our graduate studies to support an expanded research

mission, while also adjusting calendars and programs to better integrate our graduate student population with the undergraduate community. The graduate program, though still smaller than the undergraduate program, is growing more rapidly.

One theme ran through many discussions during the development of the self-study: problems identified and problems addressed. This overview will touch on some of the problems addressed, as well as some of the challenges that remain to be addressed. A detailed discussion of both will be left to the individual chapters.

Principal Findings of the Self-Study

Standard 1: Mission and Goals. At the time of the last self-study we noted that the experience of preparing that document demonstrated “the need to focus the whole community on examining the existing goal and mission statements.” Today, many still believe that the mission and goal statements serve the institution well, but they were adopted almost 25 years ago and many agree that it is time for formal public discussions.

Standard 2: Planning and Evaluation. For short-term planning, the system of faculty governance with its weekly committee meetings and monthly faculty meetings serves the academic programs well. The committee structure recently introduced by the president promotes communication between leadership in all divisions. The strategic planning completed in 2003 has been updated to provide a framework that will guide the university through 2015. The Presidential Commissions charged in 2005 with reviewing and reporting on key components of the existing strategic plan led to some immediate changes (the restoration of the office of Dean of Undergraduate Studies in Academic Affairs and the introduction of an Associate Dean in charge of First Year Programs, for example).

Standard Three: Organization and Governance. Significant changes have been made in the structure of the administration since 2001. For example, the Enrollment Management Division now reports directly to the President. The Library has moved from the Information Technology Division to Academic Affairs. Academic department heads now report to academic deans (in Arts and Sciences, Engineering, and the School of Business) instead of directly to the provost. Indeed, the academic deans were introduced in 2010, so the impact of this very significant organizational change is still emerging.

Faculty governance is strong and engages a large fraction of the tenured and tenure-track faculty. The recent efforts by the Secretary of the Faculty to increase participation in monthly faculty meetings (introducing a consent agenda and open discussions of work-in-progress by faculty committees) have been successful.

The Board of Trustees is active and engaged and taking thoughtful strides to improve its value to the institution. One immediate goal is to build stronger engagement with faculty governance.

Standard 4: The Academic Program. Student learning outcomes are well-defined at several levels, including individual disciplinary programs and institute-wide requirements, including the Interactive Qualifying Project and the Major Qualifying Project. An assessment plan is in place and regularly reviewed by the faculty. The use of that plan over the past six years has provided useful information on the quality of student learning, but the experience has also shown areas where the assessment plan itself can be improved. One significant insight from regular assessment is the need to address the gap between the learning achieved in on-campus and off-campus project work.

The graduate programs are growing rapidly, with increased emphasis on support for a growing research portfolio. For example, institutional support in the form of teaching assistantships is being shifted to support students working toward the PhD degree.

Corporate and Professional Education has changed its focus significantly in the last seven years, moving away from small satellite campuses (in the suburbs of Boston) to a corporate-partnership model in which individual companies and groups of companies in close proximity identify and support targeted professional development for their professional staff.

Standard 5: The Faculty. WPI attracts and maintains an outstanding faculty. Salaries for tenured and tenure-track faculty have been steadily increased to bring the average at all ranks to at least the 60th percentile of benchmark. We have become more successful in the competition for outstanding new faculty, partly through increased investment in start-up packages to nurture research programs.

The contributions of non-tenure-track faculty are now clearly recognized and more fairly rewarded. The faculty (and the Trustees) approved important changes to the Faculty Constitution that now defines the central role of the tenure-track faculty in fulfilling the academic mission of the university, but also identifies the valuable contributions made by non-tenure-track faculty to that mission. The faculty will work this year to define procedures for evaluation and promotion for full-time non-tenure-track faculty.

Success in obtaining external funding has improved but remains a priority for growth. In FY 2010 WPI submitted 344 proposals and received 152 award actions. This is a greater than 70 percent increase over the number of proposals submitted in FY 2000.

Standard 6: Students. WPI has experienced significant growth in both the undergraduate and graduate student populations. This growth has been achieved while also improving the quality metrics of the admitted students and increasing the number and percentage of women, international, and underrepresented students. Support services are well-designed and have adapted to meet the changing needs of the student populations. Results of student satisfaction surveys have remained strongly positive during the recent growth, but Student Affairs and Academic Affairs are working together to identify and address any areas of concern.

Student success statistics, including retention and job placement, are exceptional. Retention between the first and second years has reached and remained at 95 percent for the past five years. Job placement and salary data for graduates is one reason that the application pool has doubled. Improving graduation rates remains a priority. The four-year graduation rate remains good (70 percent), the fact that the six-year rate (80 percent) is not significantly better than the four-year rate is a current priority for assessment and improvement.

As noted above, the institution has made significant strides in integrating the graduate student population into the WPI community. Aligning the two course calendars and breaks has been a significant first step.

Standard 7: Library and Information Resources. The quality of service and the integration of the library services into the academic programs are outstanding. Library staff members are partners in many of the key academic programs, including the Great Problems Seminars and the Global Perspective Program.

The library facility has seen significant renovation and the Gordon Library has become, perhaps, the busiest building on campus—almost a second Campus Center. This popularity has brought new challenges and heightened the need to continue the work to upgrade the facility.

Standard 8: Physical and Technological Resources. WPI has made significant investments in academic, residential, and physical facilities. These investments include the Bartlett Center, a new home for admissions and financial aid; housing for upperclass students in East Hall; and the renovations of classroom, laboratory, and office spaces (in Goddard Hall and Salisbury Laboratories, in particular). The new Sports and Recreation Center will enhance campus life and also make it possible for the university to take important next steps in the re-utilization of Alumni Gymnasium.

Perhaps the most important facilities change in the past 10 years has been the completion of the Life Sciences and Bioengineering Center at Gateway Park. The state-of-the-art research facilities provide support for an expanding faculty research portfolio, but also set in motion many of significant improvements on the main campus. For example, classroom and teaching lab renovations in Goddard Hall and Salisbury Laboratories were made possible when faculty laboratories and offices were moved to the new building. Campus housing has been able to accommodate the growth in the undergraduate population, yet additional capacity is needed. We will continue to invest in improving the quality of student living space in the residence halls.

Information Technology has been agile; it has adapted to a rapidly changing external environment. WPI has met and exceeded the computing demands of a growing student body and faculty. The transition from on-site maintenance to the management of vendor capabilities and service will be a priority in the near term.

Standard 9: Financial Resources. Conservative budgeting and diversification of revenue streams have placed the institution in a solid financial condition with the resources need to sustain our mission. Budget deficits in FY 2001 through FY 2005 were replaced with budget surpluses from FY 2007 through FY 2010. A diversified revenue stream includes contributions from a streamlined Corporate and Professional Education program, which delivered net revenue to the operating budget in FY 2006 through FY 2010 (after net losses in FY 2002 through FY 2005). The Campaign for WPI is about to begin its “public phase” and will, when completed, provide critical support for scholarships, faculty, and facilities.

Continued development of the five-year sustainable academic and financial model will become increasingly important due to an anticipated decline in the endowment’s support for the operating budget and increased funding to adequately address deferred maintenance.

Standard 10: Public Disclosure. WPI is committed to clear and open communication with all internal and external audiences. Most WPI publications and web pages are produced with in-house resources and there are multiple layers of review designed to ensure that these materials are current and accurate. The Undergraduate and Graduate Catalogs contain the most complete and authoritative descriptions of the university. The web versions of all publications will continue to play an increasingly important role.

Standard 11: Integrity. We meet and exceed the standards in all dimensions. Events on the national scene have directed a new, and perhaps needed, light on the importance of integrity in all that universities do. WPI’s Board of Trustees has committed itself to a new level of engagement and responsibility regarding its oversight of the institution.

Standard One: Mission and Purposes

WPI aspires to be a model institution—for students who appreciate the importance and power of scientific and technological knowledge and who wish to prepare for lives of creative achievement, leadership, and fulfillment; for faculty who want to share in the excitement of close interaction with students and colleagues, the fun of a distinctive curriculum geared to high student achievement, and the challenge of research and professional service that make a difference in the world; and for staff who want to be part of an institution that matters greatly, that respects all of its members, and that is strongly devoted to their personal growth and development.

—From the President’s Vision Statement (2007)¹

Introduction

The Act of Incorporation² establishing the Worcester County Free Institute of Industrial Science (WPI’s founding name), signed by the Secretary of State of the Commonwealth of Massachusetts on May 10, 1865, defined WPI’s institutional purpose as “aid[ing] in the advancement, development and practical application of science in connection with the arts, agriculture, manufactures, mercantile business and such other kindred branches of practical education as said corporation shall determine.” When the Institute opened in 1868, students attended classes in Boynton Hall and went next door to put the theory they had learned into practice by making products for sale in the Washburn Shops. At a dedication ceremony on November 11, 1868, WPI’s first president, Charles O. Thompson, declared that “the main design of this school is to make it an educational force; to open the delights of learning to the mechanic and the manufacturer; as well as to the professional man; to aid in giving practical expression to the maxim that knowledge is power.”

WPI arrived on the scene as the nation, the crisis of the union behind it, set its sights on advancing from an agrarian to an industrial economy. The new technical institute in Worcester would teach its students to harness not only the force of the region’s waterways, but also the scientific, technical, and economic knowledge of a maturing society. Located in the center of a region that gave birth to and sustained the American Industrial Revolution, WPI became an important driver of that era of change, turning out mechanics, manufacturers, and entrepreneurs who would imagine and invent new human products and processes to replace natural ones. As the rural landscape gave way to an industrial cityscape, workers migrated to the region from distant villages and countries. Over the years, as the success of industrialization introduced new challenges to the way manufacturers treated human and natural resources, the people of WPI learned to redefine what was meant by “progress.” The economic challenges of the industrial revolution gave way to the social challenges of the 20th century, culminating in the social change of the 1960s. Once again, WPI responded to a changing world with a bold new curriculum that was true to its founding philosophy. The revolutionary WPI Plan that redefined the undergraduate program in the late 1960s created a space for innovation in undergraduate education that has remained vibrant and energizing to this day.

Today Worcester is still a center of immigration, and WPI students not only arrive from all over the globe, but scatter to global project centers where they learn how problems take on different forms in unfamiliar contexts. While WPI remains an “educational force” that teaches students to respect and employ the power of knowledge, our students today learn more than ever to consider the impact (for worse as well as for better) of human activity.

1 Available at www.wpi.edu/offices/president/vision.html.

2 Included at the end of Standard Three in this Self-Study.

Over the past 10 years, the institution's student populations, undergraduate and graduate programs, and disciplinary and interdisciplinary research activity have all grown in size, diversity, and complexity. Just as Boynton Hall and the Washburn Shops still embody the principles of theory and practice, Gateway Park, where construction is under way on a second building to join the Life Science and Bioengineering Center completed in 2007, represents the Institute's significant dedication to solving some of the 21st century's most pressing problems.

WPI most recently revised its mission and goals statements in 1987. In addition to referring to the education of men and women, these public statements emphasize WPI's strong commitments to work on important problems, to purposeful research, to graduate education (begun in 1898), and to corporate and professional education (begun in 1977).

WPI's Mission and Goal Statements

WPI's mission and goal statements³ are presented below. The mission statement specifies the objectives of a WPI education that can be anticipated as the careers of its graduates unfold. The more detailed goal statement articulates outcomes expected of graduating students.

The Mission of WPI

WPI educates talented men and women in engineering, science, management, and humanities in preparation for careers of professional practice, civic contribution, and leadership, facilitated by active lifelong learning. This educational process is true to the founders' directive to create, to discover, and to convey knowledge at the frontiers of academic inquiry for the betterment of society. Knowledge is created and discovered in the scholarly activities of faculty and students ranging across educational methodology, professional practice, and basic research. Knowledge is conveyed through scholarly publication and instruction. (*Adopted by the Board of Trustees, May 22, 1987.*)

The Goals of WPI

WPI was founded in 1865 to create and convey the latest science and engineering knowledge in ways that would be most useful to the society from which its students came. Since that time, the disciplines of human inquiry have expanded extraordinarily, as have WPI's constituencies. The WPI curriculum, accordingly, has been reshaped numerous times, but it has remained true to its original mission of fusing academic inquiry with social needs, of blending abstraction with immediacy, of linking new knowledge to applications.

The goals of the undergraduate program are to lead students to develop an excellent grasp of fundamental concepts in their principal areas of study; to lay a foundation for lifelong renewal of knowledge; to gain a mature understanding of themselves; and, most important, to form a deep appreciation of the interrelationships among basic knowledge, technological advance, and human need. These principles are today manifest in the WPI Plan, a unique, project-oriented program that emphasizes intensive learning experiences and direct application of knowledge. WPI remains committed to continued educational improvement and innovation.

The goals of WPI's programs of graduate instruction and research are to create and convey knowledge at the frontiers of academic inquiry. These endeavors are founded on the principle that vigorously pursued and rigorously assessed scholarship is the lifeblood of the institution. High-quality graduate instruction conveys the arts of scholarship to new generations, and it assists working professionals in maintaining currency in a world where knowledge becomes obsolete with ever-increasing rapidity.

3 The mission and goals are published in the Undergraduate Catalog and online at www.wpi.edu/about/mission.html.

A WPI education encompasses continuous striving for excellence coupled with an examination of the contexts of learning so that knowledge is won not only for its own sake but also for the sake of the human community of which the people of WPI are part. (*Endorsed by the WPI Faculty on March 5, 1987, and by the Board of Trustees on October 16, 1987.*)

The mission and goal statements were last changed in 1987, but have been reviewed by the WPI community many times in many venues. They guided the development of the 1999 Strategic Plan and preparations for the last NEASC visit in 2001. They guided the work of the Presidential Commissions in 2005, and the work of faculty, staff, and students on the Revised Strategic Plan in 2006-2007. The mission and the language of the goals statement helped the faculty define the Undergraduate Learning Outcomes in 2004. These statements continue to serve the university well.

Divisional Missions and Descriptions

The growth of WPI, both in size and complexity, necessitated significant organizational changes over the last 10 years. Each division and department brings a more narrow interpretation of the mission and goals, focusing on its own contributions to the university. The focus here will be on the Academic Affairs, Student Affairs, Enrollment Management, and Development and Alumni Relations divisions. The mission of the Finance and Operations Division will be discussed in detail in Standards Eight and Nine.

Academic Affairs

The Division of Academic Affairs, led by the Provost, has two primary responsibilities: first, to design and deliver the academic programs that will maximize student learning in the classroom, in the laboratory, and in project work; and second, to support the professional achievement of the faculty as educators and as scholars.

WPI has 14 academic departments and the Interdisciplinary and Global Studies Division. In addition to program learning outcomes (summarized in Standard Four and in the Series E forms in the Appendix), most academic departments have a mission statement that is included in the Undergraduate Catalog and on the department's website. For example, here is the published mission statement for the Department of Mechanical Engineering:⁴

The Mechanical Engineering program at WPI aims to graduate students who have the broad expertise required to confront real-world technological issues that arise in our society. Students in the program are educated to apply scientific principles and engineering methods to analyze and design systems, processes, and products that, when engineered properly, improve the quality of our lives. The Mechanical Engineering program is consistent with the WPI philosophy of education, in which each student develops the tools required for self-learning, and the sensibility to consider the impact of technology on society in the decisions they will make as engineering professionals.

Each individual department reviews the Institute's mission through its own disciplinary lens and the department mission statements interpret the university mission of "preparation for careers of professional practice" by specifying more precisely what is entailed in the discipline. For example, the emphasis on design is clear in the mission statements of the engineering programs. Each department's mission also addresses the importance of going beyond purely disciplinary goals to support WPI's goal of preparing graduates who "consider the impact of technology on society."

⁴ Published in the printed Undergraduate Catalog and at www.wpi.edu/academics/catalogs/ugrad/medept.html.

The Division of Corporate and Professional Education within Academic Affairs supports the WPI mission beyond the traditional residential campus by assisting in the lifelong renewal of knowledge and by conveying the most current knowledge of science, engineering, business, and the humanities to people whose professional positions or aspirations demand continuing education. This division partners with WPI's academic departments to provide advanced technical education, with options ranging from targeted workshops to advanced certificate programs to master's degree programs in such areas as power systems management and systems engineering.

Student Affairs

The Division of Student Affairs, headed by the Vice President for Student Affairs and Campus Life, is a partner in the educational mission and goals at WPI. The division's staff work with students, parents, faculty, and all WPI staff to create a campus environment that shapes and enriches a learning community. They strive to educate the whole person by offering programs and activities designed to influence attitudes, change behaviors, develop skills, and expand students' knowledge in the areas of global citizenship, professionalism, and leadership.

The division encompasses more than 20 offices that support student life on campus, including Residential and Dining Services, the Student Development and Counseling Center, Diversity Programs, International House, Women's Programs, and Greek Life.

Enrollment Management

The purpose of the Enrollment Management Division is to identify, attract, and enroll undergraduates who will benefit the most from WPI's project-based curriculum, and graduate students who both benefit from and support the institution's mission of scholarly research.

Every student admitted to WPI should be successful at WPI. This requires a strong background in both mathematics and science, but also the willingness to work on unstructured, open-ended problems in a collaborative atmosphere. WPI students are high achievers, and while they excel in course work, what sets them apart from some high-achieving students is their enthusiasm for open questions and an ability to work in a collaborative, team-based environment. In this regard they resemble their faculty mentors, whose own research usually begins with genuine questions, and whose conclusions may take years to reach.

The division has worked hard and had significant success in attracting a diverse student body, greatly increasing the percentage of women enrolled (from about 22 percent in 2001 to more than 30 percent today) and underrepresented minorities (from about 4 percent in 2001 to about 13 percent today). WPI students need the experience of working in a diverse community that reflects the diverse, global community in which they will work in their future careers.

Development and Alumni Relations

The office of Development and Alumni Relations builds and sustains relationships with WPI's alumni, parents, and friends, securing the vital resources that add lasting value to the university.

The Alumni Association, an independent organization, works most closely with the Division of Development and Alumni Relations. The following is its mission statement, adopted in 2007:

The mission of the WPI Alumni Association is to (1) be an independent voice and effective advocate for the alumni body within the WPI community, maintaining an independent alumni perspective and (2) connect, engage, and involve alumni with WPI and one another in support of WPI's mission and goals.

Among the many events and programs coordinated through the Office of Alumni Relations are annual class reunions, homecoming, and parents weekend. The Office of Donor Relations and Special Events hosts the annual founders and scholarship dinners, endowed professorship celebrations, and the Imagine and Achieve series with the university president. The division played a key role in the development of the most recent Revised Strategic Plan (completed in 2007) and is now focusing on preparation for the public phase of WPI's capital campaign.

Appraisal and Projection

While the institution's mission and goals statements have served and continue to serve WPI well, they have not been subject to a thorough review by the full WPI community for almost 20 years. This statement does not presume that significant changes are required, but that today's WPI community should revisit and discuss its mission and goals in the near future. For example, in the 2001 self-study, WPI noted that the mission does not explicitly reflect WPI's commitment to global learning.

It may also be worthwhile to revisit both statements in light of the rapid growth of WPI's graduate programs. While WPI has had an active graduate program for more than 110 years, it is making a transition from a program that served primarily part-time students seeking professional advancement to one more clearly focused on supporting the research mission of the university.

Significant changes have occurred in WPI's organizational structure since the last NEASC review. Some have been driven by the increased complexity of the organization and the additional support needed to fulfill WPI's mission. Perhaps the most significant change to occur at WPI has been the introduction of the three Academic Deans to lead the university's academic programs in Arts and Sciences, Engineering, and the School of Business. Each of the new Academic Deans will continue to work closely with the administration and with their faculty to construct strategic plans. This work is an excellent opportunity to review the core mission and goals.

Standard 1: Mission and Purposes		
Document	URL	Date approved by the governing board
<i>Institutional Mission Statement</i>	http://www.wpi.edu/about/mission.html	05/22/1987
Mission Statement published	URL	Print publication
Undergraduate Catalog	http://www.wpi.edu/academics/catalogs/current.html	Undergraduate Catalog
Related statements	URL	Print publications
Goals of WPI	http://www.wpi.edu/about/mission.html	Undergraduate Catalog
President's Vision Statement (2007)	http://www.wpi.edu/offices/president/vision.html	
Undergraduate Learning Outcomes	http://www.wpi.edu/offices/policies/outcomes.html	Undergraduate Catalog
Learning Outcomes for the IQP	http://www.wpi.edu/academics/Depts/IGSD/outcomes.html	Undergraduate Catalog
Learning Outcomes for the MQP	http://www.wpi.edu/academics/catalogs/ugrad/mqp.html	Undergraduate Catalog
Student Affairs: Core Values	http://www.wpi.edu/campuslife/purpose.html	Campus Planner
Information Technology Division	http://www.wpi.edu/Admin/IT/Projects/Reports/web_brochure.pdf	
Corporate and Professional Education	http://www.cpe.wpi.edu/who.html	
Development & Alumni Relations	http://www.wpi.edu/alumni/aboutus.html	
STEM Education Center	http://www.wpi.edu/academics/k12/mission.html	
Morgan Teaching and Learning Center	http://www.wpi.edu/academics/morgan/mission.html	
Bioengineering Institute	http://www.wpi.edu/academics/Research/BEI/About/index.html	
Metal Processing Institute	http://www.wpi.edu/academics/Research/MPI/vision.html	
Student Government Association	http://sga.wpi.edu	
Graduate Student Government	http://users.wpi.edu/~gsg/index.html	
Alumni Association	http://www.wpi.edu/alumni/aboutus.html	

Standard Two: Planning and Evaluation

Introduction

With its culture of assessment, WPI regularly evaluates all academic programs using both internal and external reviewers. Its focus on learning outcomes is rooted in the philosophy and practice of authentic assessment defined by the WPI Plan. In 1996, when the Accreditation Board for Engineering and Technology (ABET) wanted to test an outcomes-based approach to engineering accreditation, WPI was one of the first two institutions chosen.

WPI academic programs are unusual—from the emphasis on project work at all levels, to seven-week terms with no final exam period, to an unusual grading system without failing or punitive grades. Our community must be ready to discuss and defend the differences for each new faculty member and every external evaluator.

WPI also has a recent record of significant progress in implementing changes when evaluation identifies a need. In preparing this self-study, many faculty and staff have reviewed the 2001 Self-Study and the list of “problems solved” is impressive. Here are a few examples:

- The application numbers were flat and we were concerned about our ability to attract qualified students. Since 2001 we have doubled the number of applicants to the undergraduate program, while increasing the quality metrics of admitted students.
- We were concerned about the quality of the first year experience and its disconnection from the project work in the junior and senior years. We introduced the Great Problems Seminars in 2007 and continue to expand this first-year program.
- We were concerned that faculty salaries were below the benchmark of our peer institutions. WPI has invested more than \$1million over the past four years to bring its full professors’ salaries to the appropriate level; WPI’s top performing faculty (and staff) are, on average, now paid at or above the 60th percentile according to the benchmark data of peer institutions.
- We identified challenges related to IT support for evaluation and planning. Each division now has a dedicated Information Analyst; data queries that used to take several weeks are now done in days or hours.

WPI is a small, connected community and some of the best planning and evaluation begins in informal discussions. The monthly faculty meetings include the full faculty (tenured, tenure-track, and non-tenure-track), as well as staff from every WPI division. Students are voting members of most faculty governance committees. Administration and staff from Student Affairs and Enrollment Management serve as ex officio members of key faculty governance committees. The President’s Office organizes regular “Town Meetings” to engage faculty, staff, and students in open discussion of current issues, but also to celebrate community achievements.

Planning and Evaluation at the University Level

At the time of the last NEASC Self-Study, WPI had just completed a major strategic planning effort designed to guide the university through 2010. That plan, published under the title “New Ideas, New Vision, New Resources: An Ambitious Plan to Raise the University to New Levels of Quality and Prestige,” was adopted by the faculty and Board of Trustees in 1999.¹ Following are the goals articulated in the 1999 Strategic Plan:

¹ www.wpi.edu/Stratplan.

- 1: Enhance the Quality of WPI's Academic Programs
- 2: Develop WPI's Position as a National University
- 3: Establish WPI as a Leader in Global Technological Education
- 4: Improve WPI's Campus Culture and Community Presence
- 5: Expand WPI's Educational Resources

With the arrival of a new president in 2004 came a re-evaluation of that plan and an assessment of a number of different areas. At his first Town Meeting in September 2004, President Dennis Berkey announced his plans to form seven groups of faculty, staff, and students to help develop strategic plans for the university for the future.

- Commission A1: General Education and the First Year
- Commission A2: The Fine and Liberal Arts and the Sufficiency
- Commission B: The IQP and Global Studies
- Commission C: Research and Graduate Education
- Commission D: Faculty Workload
- Commission E: Shape and Size of the University
- Commission F: Rankings

The commissions, which included 78 administrators, faculty, staff, and students, then met regularly throughout the spring of 2005. Reports were delivered to the President and findings discussed widely by the community in the fall of 2005. The final reports were made available, and are still available, to the entire WPI community.²

Each report listed a number of recommendations for improvements in its area and these recommendations formed the basis for a number of initiatives that have been carried out since. For example, Commission A1 recommended re-creation of the Division of Undergraduate Studies with a new Office for the First Year, charged with oversight of a number of First Year initiatives, including introduction of an interdisciplinary seminar program for first year students. Since then, WPI allocated the resources needed to create the office of Dean of Undergraduate Studies, add the Associate Dean for the First Year, and initiate the Great Problems Seminar program for first-year students.

Similarly, the Commission on the Fine and Liberal Arts and the Sufficiency made recommendations to change both the nature and the name of our humanities and arts requirement; the requirement was restructured to include components of depth and breadth in the course work, and in 2008 the Sufficiency project was replaced with Inquiry Seminars and Practicums.

Building on the work of the Commissions, in 2006 President Berkey proposed the creation of a Strategic and Campaign Planning Task Force. The charge was to update and extend the existing Strategic Plan and recommend a corresponding Campaign Plan for a major fundraising effort that would begin later in 2007 and extend to the university's sesquicentennial year in 2015. By agreement between the Secretary of the Faculty and the President, the task force comprised five members of the faculty (three appointed by the Committee on Governance, two by the President), five members of the senior administration, one undergraduate student,

² www.wpi.edu/offices/president/initiatives.html and in the Workroom.

one graduate student, the Secretary of the Faculty, and the President. The committee met weekly through the spring of 2006; at the conclusion, the President provided an outline of what had been discussed and asked members for feedback. The final result was based on that outline and feedback.

The five goals identified in the 1999 Strategic Plan were expanded into the following list of eight Strategic Goals for the period 2007 through 2015:

1. Promote the continuing development of the WPI Plan as the essential core of WPI's premier science- and technology-centered undergraduate program.
2. Further enhance the quality of academic programs.
3. Strengthen institutional support for graduate education and faculty research, primarily in areas of significant student demand, demonstrated leadership, potential for external sponsorship, and significant societal or national need.
4. Support and value a high quality of campus life and sense of community.
5. Develop campus facilities according to an explicit plan for supporting academic and co-curricular needs and property maintenance.
6. Promote WPI as a national university.
7. Develop nontraditional sources of revenue to strengthen the university financially and keep WPI affordable.
8. Improve alumni relations.

The full version of the Revised Strategic Plan³ continues to guide discussion and planning. For example, the new Academic Deans have used these eight goals as the starting point for their own strategic planning. President Berkey's annual progress reports to the Board of Trustees are structured around these strategic goals. The President's Office has also engaged the WPI community in targeted initiatives related to key issues raised in the development of the revised strategic plan. Two examples are the President's Task Force on Sustainability⁴ and the President's Council for the Support of Women and Minorities at WPI.⁵ Each of these commissions brings together faculty, staff, students, and the administration.

The Campaign Plan was approved by the Board of Trustees and the (silent) Leadership Phase of the campaign commenced in fiscal year 2007-08; more than \$102 million had been raised as of August 2011, despite the economic crisis of 2008-09 and the subsequent sluggish rebound. The Development and Alumni Relations Division is now preparing for a public launch of the campaign in June 2012.

Campaign planning has engaged all WPI constituencies from the earliest stages. The Strategic and Campaign Planning Task Force provided critical input on campaign funding priorities, planning, and marketing. In addition, regular presentations on the campaign—its progress and proposed marketing strategies—have been made to the Board of Trustees, faculty groups, the campus community at Town Hall meetings, the Alumni Association Board, and the Department Advisory Boards.

3 www.wpi.edu/offices/president/strategic-plan.html.

4 www.wpi.edu/about/sustainability/taskforce.html.

5 www.wpi.edu/offices/president/support-women.html.

Planning and Evaluation at the Department Level

Departments and divisions follow an annual cycle of evaluation that is tied to and helps inform the budget planning process. This is an internal evaluation involving administration, faculty, and staff which provides time for reflection on past accomplishments and clarification of future goals.

For staff, there is an annual review cycle supervised by the Office of Human Resources. This process begins in January when each staff member completes a self-appraisal—the starting point for discussion with the supervisor. While part of the discussion focuses on the individual's performance over the past year, another part focuses on the position and how the responsibilities of the position have changed. This information may be used by the supervisor in meetings with his or her division head to propose changes to business processes, organizational structures, and resource allocation.

A similar cycle of evaluation exists for tenured and tenure-track faculty. Faculty submit annual reports each January, including standardized summaries of teaching activities and external research funding. These reviews, guided by faculty promotion and tenure criteria, and are part of the annual department review required for probationary faculty. The information is also used in other ways: for example, faculty members are asked to describe innovations in classes and projects during the previous year; this information is then shared with the director of the Morgan Teaching and Learning Center to aid in planning for faculty professional development during the coming year.

As noted in the chapter on Standard Five, there has been an increase in the number of staff with full-time appointments in teaching and advising at WPI (from 13 in 2001 to 45 in 2010). Recent changes to the faculty constitution make it possible to create new evaluation procedures that better reflects their contributions to the academic disciplines and the educational mission of WPI. The administration has committed funding to bring the salaries for full-time non-tenure track faculty to appropriate levels—appropriate in comparison with tenure-track salaries and job descriptions at WPI, not simply in comparison with the inadequate national averages for this type of faculty. WPI has essentially established a floor of \$50,000 for all those performing well, with many such salaries being substantially higher.

The head of each academic department reviews the contributions of its faculty to all aspects of the university's mission and identifies needs and priorities for resource allocation in the coming year and an annual report⁶ is submitted (usually in July) to the Provost's Office. These annual reports may be used by other offices on campus, as well. For example, information about specific changes to a department's academic programs has been used to update the NEASC Series E forms.⁷

Until 2010 each department head met individually with the Provost to review the annual report and discuss the department's plans for the coming year. This year discussions took place with the Academic Deans; each dean then met with the Provost to discuss the departments' plans as part of a coherent whole.

External Reviews for Program Development and Accreditation

WPI's engineering departments complete a self-assessment and undergo a rigorous evaluation by visiting teams from ABET every six years. The Biomedical, Chemical, Civil, Electrical, Industrial, and Mechanical Engineering programs completed self-studies in 2008, were reviewed for and received accreditation in 2009, and are scheduled for evaluation in 2015. The Aerospace and Environmental Engineering programs were reviewed (for the first time) by ABET in 2009 and received initial accreditation; evaluation is scheduled for 2015.

6 Copies of the annual reports for academic departments are available in the Workroom.

7 Included in the Appendix and in the Workroom.

Robotics Engineering, which was approved as a degree program by the faculty in 2006 and launched in 2007, completed its first self-study in 2010. ABET made a site visit to review WPI's application for initial accreditation in fall 2010; the commission announced its official decision to accredit the program in August 2011.

The Computer Science program was reviewed by ABET in 2009; it is awaiting the recommendation of the commission. The department is considering a separate external review in the near future, with an emphasis on program dimensions not considered by ABET.

The self-study reports completed for the 2009 review are available in the workroom. Each of these reports is a resource for more general program evaluation; for example, the Undergraduate Outcomes Assessment Committee reviews the reports to collect information on student achievement of WPI's undergraduate learning outcomes.

The School of Business (then named the Department of Management) was reviewed and accredited by the Association to Advance Collegiate Schools of Business (AACSB) in 2001. (WPI is the only institution in the United States with both AACSB- and ABET-accredited programs housed in the business academic unit.) The School of Business is currently preparing its study for an external review in 2012.

For academic programs that do not maintain accreditation by ABET, other forms of internal and external review are used, though not on a regular schedule. The Physics Department was reviewed by a visiting team in 2009. The Chemistry and Biochemistry department completed an external review in 2010 as part of regular reviews for the American Chemical Society. With the encouragement and support of the new Dean of Arts and Sciences, departments in this division are expected to develop a more regular cycle of external review.

Many academic departments, interdisciplinary programs, and research centers have advisory boards with representation from industry as well as academia.⁸ While these boards provide valuable external perspectives to academic programs, they also provide resources in terms of financial support, access to equipment and expertise, and project and research opportunities for faculty and students. In some cases, as with Robotics Engineering, the advisory boards have been involved in the creation of the program, before the program is brought to the WPI faculty for approval.

Departments perform periodic reviews that focus on specific parts of the WPI mission. For example, the Humanities and Arts Department has done evaluations of the new Humanities and Arts requirement in each of the last two summers. WPI has engaged external consultants to evaluate the Interactive Qualifying Projects several times (starting in 1975), the most recent in 2010.⁹ The Great Problems Seminars have been evaluated by an external assessment consultant since the start of the program in 2007.¹⁰ The office of Development and Alumni Relations deploys an alumni survey every year. Most recently, WPI commissioned a major study to focus on the long-term impacts of the WPI Plan.¹¹

8 A complete list, with current members, is on the web at www.wpi.edu/offices/advisory/deptadvisory.html.

9 A binder containing several internal and external evaluations of the IQP is included in the folder for Standard Four.

10 A binder with all of the reports is included in the Workroom.

11 UMass Donahue Institute Proposal is in the Workroom.

Projection

This report has touched only some of the ways that regular evaluation is part of the WPI culture. The continuing focus on student learning outcomes and the Outcomes Assessment Plan is discussed in more detail under Standard Four. Planning and evaluation is a key part of financial planning presented in Standard Nine.

The role of the new Academic Deans in planning and evaluation is still developing, but one of the main motivations for creating these new positions was to provide clear, focused leadership for planning and evaluation in support of the WPI mission. They have started to play a role in annual review of faculty and departments and an important external role in promoting the university. They have also brought a valuable external perspective to all internal discussions.

One of the goals discussed in the Revised Strategic Plan was to increase the undergraduate population to between 3,200 and 3,400 by 2015. The goal was reached in 2009, partly due to the good work of the Enrollment Management Division but perhaps also partly because of changes in the economy and an improvement in WPI's national reputation.

Standard 2: Planning and Evaluation			
PLANS	Year of completion	Effective dates	URL or folder number
Strategic Plans			
Immediately prior strategic plan	1999	2000-2007	http://www.wpi.edu/Stratplan/
Current Strategic Plan	2007	2007-2015	http://www.wpi.edu/offices/president/strategic-plan.html
Next strategic plan			
Other institution-wide plans			
Master plan	2003	2003-present	http://www.wpi.edu/Master/
Academic plan			
Financial plan			
Technology plan			
Enrollment plan			
Development plan			
Plans for major units (e.g., departments, library)			
Gordon Library: Long-range Plan			http://www.wpi.edu/academics/Library/About/assessment.html
Gordon Library; Information Literacy Plan	2011	2011 -	http://www.wpi.edu/Academics/Library/Faculty/ilvision.pdf
Information Technology	2007	2007 -	http://www.wpi.edu/Admin/IT/Projects/Reports/
EVALUATION			
Academic program review			
Program review system (colleges and departments). System last updated:			http://www.wpi.edu/Academics/Outcomes/programs.html
Program review schedule (e.g., every 5 years)			Variable Schedule
Sample program review reports (name of unit or program)			URL
Electrical Engineering Self-Study 2008			http://www.wpi.edu/Images/CMS/Outcomes/ECE_self_study_modified.pdf
Computer Science Review Coordination Page			http://web.cs.wpi.edu/CAC/
Homepage for Departmental Reviews			http://www.wpi.edu/Academics/Outcomes/programs.html
System to review other functions and units			
Program review schedule (every X years or URL of schedule)			http://www.wpi.edu/academics/Outcomes/learning.html
Sample program review reports (name of unit or program)			
IQP Project Review			http://www.wpi.edu/Academics/Outcomes/interdisciplinary.html
MQP Project Reviews			http://www.wpi.edu/Academics/Outcomes/disciplinary.html
Humanities and Arts Program Reviews			http://www.wpi.edu/Academics/Outcomes/humanities.html

Standard Three: Organization and Governance

Introduction

WPI operates under a charter, granted by the Commonwealth of Massachusetts in 1865, with full and unrestricted authority to carry out its educational mission and to award degrees at the bachelor's, master's, and doctoral levels.

Each of WPI's five fundamentally distinct organizational units—the Board of Trustees (or Corporation), the Faculty, Student Government, the Alumni Association, and the Administration—has its own form of governance or organization. Four of these units have formal articles of organization, such as bylaws or constitutions. The primary mission and procedures of the fifth unit, the Administration, are articulated in the Faculty Handbook and the Policies and Procedures section of the Policies and Benefits Manual.¹

Description and Appraisal

The Board of Trustees

The ultimate authority for governing the university rests with the WPI Board of Trustees. Composed of a minimum of 12 members, the Board currently has 30 trustees and 46 non-voting emeriti members. The Board of Trustees is WPI's legal policy-making body. The Administration is charged with carrying out its policies and implementing them on a day-to-day basis. The President, who serves as the university's chief executive officer, is a member of the Board.

New trustees are elected to membership by the current members of the Board. Trustee candidates are recommended to the Nominations and Governance committee of the Board. Once that committee has vetted the candidates and approved their candidacy, the full Corporation votes on whether to invite them to join the Board. Trustee terms, except for that of the President, are five years. Any trustee may be re-elected for an immediately succeeding term subject to a limit of 15 consecutive years of service. Any trustee who has served for 15 consecutive years may be re-elected following a one-year absence from the Board of Trustees.

The responsibilities of the Corporation include ensuring that effective strategic and operational planning takes place, approving major expenditures and commitments, monitoring results against plans, and ensuring that WPI has effective top management. These duties and responsibilities are outlined in a set of bylaws,² the most recent amendments to which were made in 2007.

The Board of Trustees is organized into 10 standing committees appointed by the Board chair and approved by the Corporation. These committees, each charged with specific responsibilities, are Academic Planning; Advancement; Audit; Budget and Finance; Executive; Executive Compensation; Investment; Facilities and Campus Infrastructure; Nominations and Governance; and Student Affairs. There is also an ad-hoc Gateway Park Advisory Committee, which considers matters related to the development of the university's Gateway Park district. Much of the business that comes before the Board is discussed and resolved by these committees and then brought to the Corporation for adoption or approval as necessary and appropriate. The Board's Executive Committee is composed of the chairs of each standing committee, the Chairman and two Vice Chairs of the Corporation, and the President.

1 The Faculty Handbook as well as the Policies and Benefits Manual are available in the Workroom.

2 The Bylaws of the Corporation are available at www.wpi.edu/offices/trustees/bylaws.html.

The WPI Board of Trustees meets at least three times annually, usually in October, February and May (the annual meeting). The Executive Committee typically meets four times each year. Most Board committees meet at least three times annually, but some meet as often as six times during the year. Examples of the former are Advancement, Budget and Finance, and Student Affairs. Examples of the latter are Academic Planning, Audit, and Investment. During the past year, average attendance at Corporation meetings has been about 70 percent of the active members, with several emeriti members in attendance. The seven vice presidents, along with appropriate senior staff, also attend Corporation meetings and serve as staff liaisons on a regularly assigned basis to the various committees. Two representatives of the faculty (the secretary of the faculty and the chair of the Committee on Governance) and two students (the presidents of the undergraduate Student Government Association and the Graduate Student Government) are invited to meet with the Corporation and with most committees as observers.

No member of the Board, other than the President, receives compensation for his or her service as a member of the Corporation. The Board adopted a conflict of interest policy³ in 1990 that each trustee and officer is asked to sign annually. It details any external affiliations that might place them in a conflict-of-interest situation with WPI. All trustees and officers have signed this statement.

Members of the Board are characteristically successful in their chosen careers. Current Board members include the Senior Vice President of Exxon Mobil Corporation, the Senior Vice President of Morgan Stanley, the President and CEO of SRI International, and the Executive Vice President of EMC Corporation. The average age of Board members is approximately 57.5 years and 23 percent (7 out of 30) members are women. Twenty members of the Corporation are graduates of WPI; most hold engineering degrees.

Administration

The Provost reports directly to the President and they meet weekly to be sure that both are appropriately engaged on matters of academic administration and leadership.

The senior administration, including the President, the Provost, the Vice Presidents, and the Chief of Staff meet as a full group (named the **Salisbury Group**) bi-weekly throughout the year. A subset of this group, including the President, the Provost, the Senior Vice President, the Vice President for Finance and Operations, and the Vice President for Academic and Corporate Development (the **Washburn Group**) meets each week. The purpose of this group is to ensure that matters of academic administration involving the enrollment division, the distance learning programs, the corporate and professional education programs, and any such matters that connect with but are not entirely contained within the Division of Academic Affairs, are fully addressed and that appropriate administrative and financial support is being provided to the academic programs.

A third group (the **Thompson Group**) also meets bi-weekly, and is composed of the Washburn Group, plus the Dean of Engineering, the Dean of Arts and Sciences, the Dean of Business, the Dean of Graduate Studies, the Dean of Undergraduate Studies, and the Dean of the Interdisciplinary and Global Studies Division. These various meetings ensure that the leadership team is in constant communication with peers and with the academic leadership of the Institute.

There are several other groups that meet regularly as a means of ensuring good communication across faculty and administration. The University Council is a group composed of 18 members of the Administration and 18 members of the faculty. The group meets four times during the academic year to share information about issues on campus that affect faculty and students, and to ensure that the faculty participants feel

3 A copy of the form is on the web at www.wpi.edu/Images/CMS/President/WPI_annualconflictofinterest.pdf.

fully informed about administrative initiatives. Agenda items have included budget reports, status reports on construction projects, reports on faculty governance concerns, and reports about the outcomes for new academic initiatives such as the Great Problem Seminars.

The President's Task Force on Sustainability⁴ was created by the President to gather together faculty, staff, students, and administrators who have an expressed interest in matters pertaining to sustainability projects and initiatives. This group meets regularly to ensure that WPI's efforts around sustainability at all levels are efficient, well-coordinated, and well-publicized. This group has worked together with the result that WPI's 'Sustainability Report Card' grade has risen from a D to an A- in only three years.⁵

The President's Council for the Support of Women and Minorities at WPI⁶ is composed of administrators and faculty members, and is chaired by the President. This group is charged with examining the conditions for women and underrepresented minorities on campus, for faculty, staff, and students, and developing strategies to ensure that the campus embraces all groups and finds way to ensure success for all members of the WPI community.

The Human Resources Advisory Group grew out of a staff satisfaction survey, and is composed of faculty and staff volunteers who examine the working conditions at WPI and propose new programs that would improve the working experience. Some of the outcomes from suggestions made by this group include staff training programs (on topics identified by staff) and a revision to the annual performance appraisal process.

Faculty

The Constitution and Bylaws of the WPI Faculty were adopted in 1970 (developed in parallel with the WPI Plan) and revised most recently in 2011. The Constitution now defines the WPI Faculty as "the President, the Provost, and those individuals holding full-time appointments with the exact titles: Professor, Associate Professor, and Assistant Professor."

Faculty governance at WPI operates through a committee structure with committees bringing motions for approval to monthly faculty meetings chaired by the Secretary of the Faculty. He or she also serves as one of the Faculty representatives to the Board of Trustees.

The following are the standing elected committees of the faculty, with brief descriptions of their functions:

- **Committee on Governance (COG):** oversees faculty elections; addresses issues raised by members of the community that are not obviously under the purview of another standing committee; formulates proposed changes to the Faculty Constitution; addresses questions of jurisdiction among other committees. COG consists of five elected Faculty Members, one member of the Faculty appointed by the President, and, *ex officio*, the Provost and the Secretary of the Faculty. The Chair of COG is the second Faculty representative to the Board of Trustees.
- **Committee on Academic Policy (CAP):** makes recommendations concerning policy for the undergraduate program, especially in the areas of admissions and financial aid, degree requirements, and assessment of the quality of the academic program.
- **Committee on Academic Operations (CAO):** monitors procedures for administering existing academic policies; recommends to the faculty changes in courses, projects or programs; reviews proposals for experimental courses; reviews petitions for exceptions to established rules.

4 Information on the task force is available at www.wpi.edu/about/sustainability/taskforce.html.

5 Rating by the Cambridge-based Sustainable Endowments Institute.

6 Information on the task force is available at www.wpi.edu/offices/president/support-women.html.

- **Committee on Graduate Studies and Research (CGSR):** oversees all policy and procedural activities related to research and the graduate program.
- **Committee on Tenure and Academic Freedom (CTAF):** recommends faculty for tenure to the Provost and reviews problems involving academic freedom raised by any faculty member.
- **Committee on Appointments and Promotions (COAP):** makes recommendations to the Provost for promotions to associate and full professor and for sabbaticals; participates in selection and review of department heads.
- **Committee on Advising and Student Life (CASL):** oversees the activity and development of academic advising programs as well as any aspects of student life that affect learning.
- **Committee on Administrative and Financial Policy (FAP):** represents to the administration the interests of the faculty concerning administrative and financial policies.
- **Faculty Review Committee (FRC):** reviews, at a candidate's request, negative decisions on nonrenewal of probationary appointments or on tenure, with the power to require reconsideration; reviews student petitions for grade changes in courses and for projects.
- **Undergraduate Outcomes Assessment Committee (UOAC):** reviews data regarding student learning outcomes and makes recommendations to the Committee on Academic Policy.

Most of these committees meet at least weekly throughout the academic year, distribute minutes of each meeting to the community, and provide an annual report summarizing their work during the year. All of this information is collected and available on the faculty governance homepage.⁷

Each of the committees responsible for academic program development or academic operations (CAP, CAO, CGSR, CASL, and UOAC) has student representatives with full voting rights. In addition, key administrative personnel such as the Registrar, the Director of Academic Advising, the Administrator of Academic Programs, and the Director of Graduate Admissions are either members or regular guests of these committees.

Recent amendments to the Constitution have involved the rules for the Faculty Review Committee (in May 2010) and the role of non-tenure-track faculty at WPI (in May 2011). The faculty (and the Board of Trustees) approved amendments to the Faculty Constitution that made three changes. First, while the Constitution was originally written for and recognized tenured and tenure-track faculty as the only faculty at WPI, the first amendment approved in May 2011 recognized the existence and role of non-tenure-track faculty at WPI. The second amendment removed a strict limit on time-in-service for non-tenure-track faculty. The third amendment eliminated the title "Instructor" for individuals in tenure-track positions. This is part of ongoing work for faculty governance in 2011.

Academic Departments

Each academic department has a Department Head, typically appointed to a five-year term, who provides operational and intellectual leadership for his or her department. As mentioned in the discussion of Standard Two, starting in 2010, the academic department heads report to an Academic Dean (of Arts and Sciences, Engineering, or Business). The Provost still holds monthly meetings with all department heads, and also meets with the Academic Deans, including the Dean of Undergraduate Studies, Dean of Graduate Studies, Associate Dean for the First Year, and Vice President for Academic and Corporate Development.

⁷ At www.wpi.edu/Campus/Faculty/committees.html and in the Workroom.

The governance structure inside the academic departments does vary, but the following list is typical:

- The **Department Tenure Committee** is responsible for the annual review of probationary faculty and, as part of the Joint Tenure Committee, reviews the dossier for a member of the department being considered for tenure. This committee, including its structure and procedures, is defined in the Faculty Constitution.
- A **Personnel Committee** advises the department head in matters related to promotion and searches for new faculty.
- A **Curriculum Review Committee** reviews the courses, and collects information for outcomes assessment and accreditation reviews.
- A **Graduate Committee** is responsible for the development of graduate courses and programs as well as the review of applications for admission to the department's graduate programs.

Student Government

The undergraduate Student Government Association (SGA) has a publicly available constitution and bylaws.⁸ The association defines itself as “the voice of the WPI undergraduate student body” and seeks to improve both the academic and the social life of students. The SGA manages the funds collected in student activities fees and supports more than 200 student-run clubs and organizations.

It is the SGA that selects undergraduate students to serve on the faculty governance committees. SGA also invites frequent visits from faculty and administration to present and discuss initiatives and issues at its weekly meetings. Issues of recent interest have been: proposed changes to the WPI grading system, support for (voluntary) mid-term course evaluations, and the development of a student-written explanation of the new Humanities and Arts requirement.

The Graduate Student Government (GSG) was reformed in 2009 with a constitution and bylaws published on the Web.⁹ The organization provides representatives to faculty governance committees (CGSR and CASL) and has been a force for building community among the graduate student population at WPI.

Alumni Association

The mission of the WPI Alumni Association is to be an independent voice and effective advocate for the alumni body within the WPI community and to connect, engage, and involve alumni with WPI and one another in support of WPI's mission and goals. The association has a board of directors, that includes alumni, a representative from the WPI Office of Development and Alumni Relations, and a current student representing the Student Alumni Society. The association has its own mission and bylaws, most recently updated in 2007.¹⁰

Information Technology

The Information Technology Governance Committee (sometimes referred to as the UDC, or Unified Digital Campus, Governance Committee) meets monthly to evaluate and prioritize information technology needs. It consists of the Chief Information Officer, the seven vice presidents, the university's information analysts, and the chair of the Committee of Information Technology Policy, a subcommittee of the faculty Committee on Governance. Additional information about the information technology Governance Committee will be found in Standard Eight.

8 Available at sga.wpi.edu/index.pl.

9 Available at <http://users.wpi.edu/~gsg/constitution.html>.

10 Available in the Workroom.

Projection

In 2009, after the successful completion of the revision to the Bylaws and the Committee Charters, incoming Chairman of the Board of Trustees, Stephen E. Rubin '74, elected to focus on reviewing areas of governance, to ensure that WPI was following best practices for all levels of governance, beginning with the Board of Trustees and faculty engagement. The initiative has led to the creation of a trustee and faculty committee, the Governance Task Force, which is working under the guidance of a consultant from the Association of Governing Boards. This group is examining Board engagement and areas of influence, as well as looking at proper Board composition and appropriate participation by students and faculty members in Board meetings.

The Secretary of the Faculty, with the support of the full faculty, made significant revisions to the structure and schedule of the monthly faculty meetings. One key change was the introduction of a “consent agenda” to streamline the approval of what should be the most routine of faculty business. The change created space in the monthly meetings for more discussion of strategic goals. For example, individual faculty governance committees were invited to present “work in progress” in order to obtain broad community in the early stages of policy development.

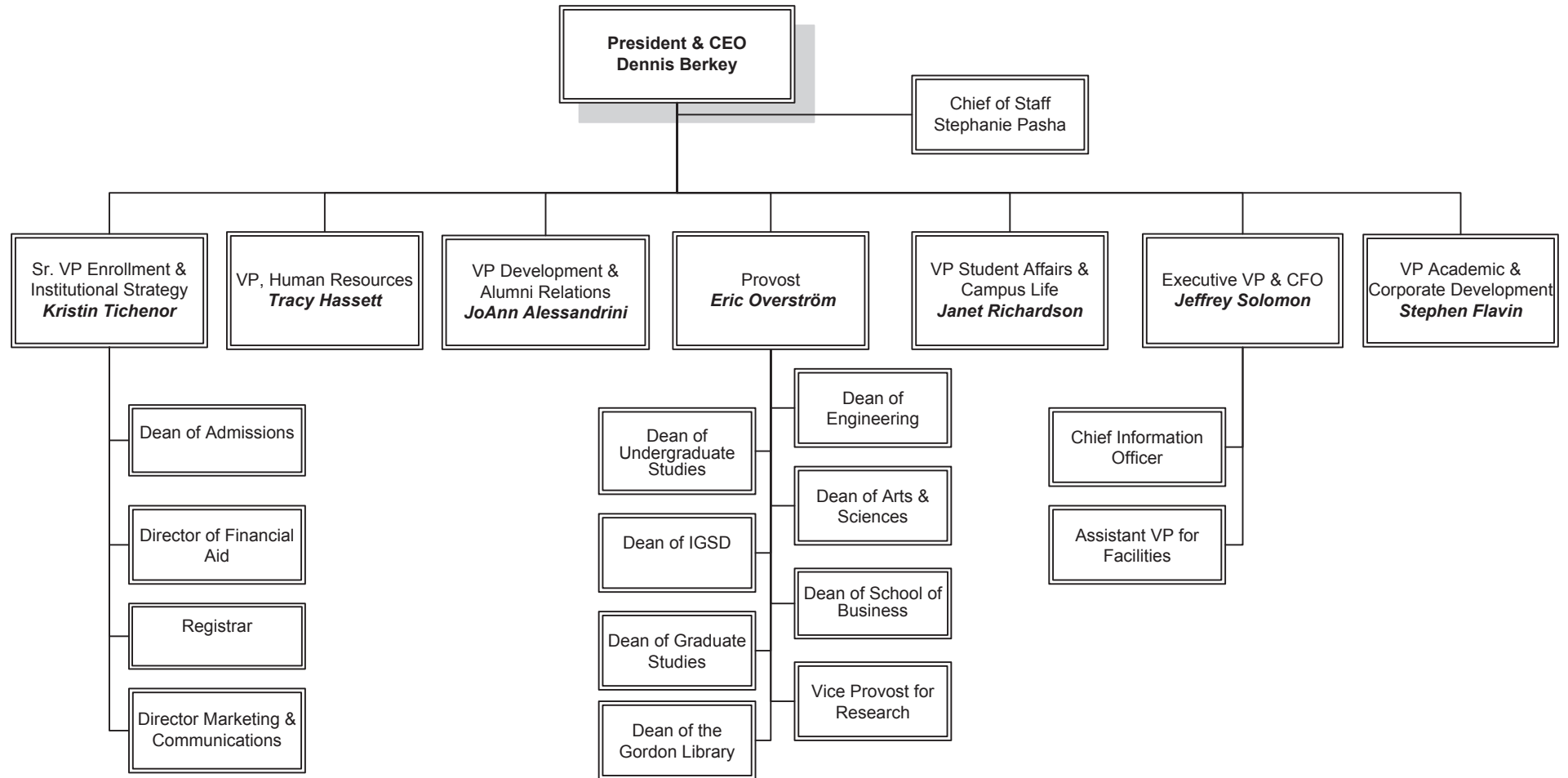
The Student Government Association is working on several initiatives that focus on streamlining the budget review process for student organizations; they are in the midst of “going paperless” and moving as many of their processes to an entirely online system.

The Graduate Student Government is working to build partnerships with the undergraduate Student Government Association to develop more social connections between graduate and undergraduate students. For the first time in academic year 2010-11, the graduate and undergraduate calendars were coordinated so that there would be a break for graduate students coinciding with the undergraduate term break.

Standard 3: Organization and Governance							
Governing board				URL			
By-laws				http://www.wpi.edu/offices/trustees/bylaws.html			
Board members' names and affiliations				http://www.wpi.edu/offices/trustees/current.html			
Board committees				URL or document name for meeting minutes			
Academic Planning				Standard Three: Trustee Minutes Folder			
Advancement							
Audit							
Budget and Finance							
Executive							
Executive Compensation							
Investment							
Facilities and Campus Infrastructure							
Nominations and Governance							
Student Affairs							
Gateway Park Advisory Committee (ad hoc)							
Major institutional committees or governance groups				URL or document name for meeting minutes			
All Faculty Governance Committees				http://www.wpi.edu/Campus/Faculty/committees.html			
Department Heads				Standard Three: Departmen Head's Minutes			
Student Government Association				http://sga.wpi.edu			
Unified Digital Campus Governance Committee				Standard Three: UDC Governance Minutes			
University Council				Standard Three: University Council Minutes			

Standard 3: Organization and Governance									
(Locations and Modalities)									
Campuses, Branches, Locations, and Modalities currently in operation.									
		City		State or Country		Date Initiated			
Main campus		Worcester		MA		May 10, 1865			
Other principal campuses									
Branch campuses									
Other instructional locations									
Distance Learning, e-learning						Date Initiated			
First on-line course						8/15/00			
First program 50% or more on-line						8/15/00			
First program 100% on-line						8/15/00			
Distance Learning, other						Date Initiated			
Modality		None							
Correspondence Education						Date Initiated			
		None							
<p>Note: WPI has offered distance courses since 1979, but the modality shifted entirely to an the e-learning mode in the fall of 2000. Before that time, lectures were videotaped and delivered (by UPS) to the students.</p>									

WPI Organizational Chart: Fall 2011





Commonwealth of Massachusetts.

IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND SIXTY-five.

AN ACT

to incorporate the Worcester County Free Institute of Industrial Science.

Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows:

Section 1. George F. Hoar, Seth Sweetser, their associates and successors, are hereby made a body corporate, by the name of the Worcester County Free Institute of Industrial Science, for the purpose of establishing and maintaining in the city of Worcester, an institution to aid in the advancement, development and practical application of science, in connection with arts, agriculture, manufactures, mercantile business and such other kindred branches of practical education as said corporation shall determine; with all the powers and privileges, and subject to all the duties and

liabilities set forth in all laws which now are or may hereafter be in force and applicable to such corporations. The mayor of the city of Worcester, for the time being, shall ex officio, be a member of said corporation, and one member shall be appointed by the board of education. from time to time, as a vacancy may occur; and said corporation shall not consist of more than twelve members at any one time.

Section 2. Said corporation shall have authority to accept and hold in fee simple, or any less estate, any real or personal estate to an amount not exceeding four hundred and fifty thousand dollars, to be devoted exclusively to the purposes aforesaid and in conformity with conditions made by any donor, not inconsistent with this act, expressed by him in writing and recorded in the records of said institution.

Section 3. Said corporation may establish separate departments of scientific instruction and pursuit whenever it can be done

without interfering with the unity of purpose of said institution or the government and management of the same, may designate and distinguish such departments by specific names, and accept any moneys for the special advancement of said departments; provided that no moneys shall be applied to any uses or purposes, not embraced within the general design of said institution as expressed in this act.

House of Representatives. May 6. 1865.
Passed to be enacted. Alex. H. Bullock. Speaker.

In Senate. May 9. 1865.
Passed to be enacted. J. E. Field. President.
May 9th 1865. Approved.

John A. Andrew.

Secretary's Department.
Boston. May 10. 1865.

A true copy:-

Oliver Stansbury.

Secretary of the
Commonwealth.

Standard Four: Academic Programs

The WPI graduate of the future must have an understanding of a sector of science and technology and a mature understanding of himself and the needs of the people around him. While an undergraduate, he must demonstrate that he can learn and translate his learning into worthwhile action. He must learn to teach himself those things that are needed to make his actions socially significant. A WPI education should develop a strong degree of self-confidence, an eagerness to contribute to the community beyond oneself, and an intellectual restlessness, a spur to continual learning.

—From the Goal Statement for the WPI Plan, approved by the Faculty in December 1969

Introduction

WPI, the nation's third oldest independent technological university, was established in 1865 by New England industrialists John Boynton and Ichabod Washburn, along with their associates. Boynton and Washburn gave their names to the Institute's first two buildings: Boynton Hall, the original classroom building, and the Washburn Shops, a working machine shop. The buildings retain their distinctive original towers (Boynton with its four-sided clock and Washburn with its arm-and-hammer weathervane), which have come to symbolize WPI's historic commitment to academic excellence and real-world project experience.

While WPI has offered graduate degrees since 1898, it has focused primarily on undergraduate education for most of its history. Until recently, most graduate programs have served part-time students studying for advancement in their professions. In recent decades the graduate programs have become far more integrated with faculty research and the scholarly mission of the institution and in 1994 WPI's Carnegie classification was changed from "Comprehensive University" to "Doctoral/Research Universities–Intensive" because of the growth in its production of PhDs.

At the undergraduate level, WPI now offers 33 bachelor's degree programs in engineering, the physical and life sciences, computer science, the mathematical sciences, business, the humanities and arts, and the social sciences. Of these, two lead to the degree of Bachelor of Arts and the remaining 31 lead to the degree of Bachelor of Science. Detailed requirements for majors, double majors, concentrations within majors, minors, and combined bachelor's/master's degrees are published annually (in print and online) in the Undergraduate Catalog.¹

At the graduate level, WPI offers 37 master's degree programs in engineering, the physical and life sciences, computer science, the mathematical sciences, business, and the social sciences. There are 18 programs leading to the doctor of philosophy degree. Students have the option to design interdisciplinary programs at the intersections of these fields. All requirements are published annually (in print and online) in the Graduate Catalog.²

Graduate certificates are available in some areas for professional development and, in some cases, course work may be applied toward a graduate degree program. WPI's Division of Corporate and Professional Education offers noncredit certificate programs in biomanufacturing, geometric dimensioning and tolerancing, leadership and management development, lean enterprise, medical devices, project management, process

1 Available in the Workroom and at www.wpi.edu/academics/catalogs/ugrad.html.

2 Available in the Workroom and at www.wpi.edu/academics/catalogs/grad.html.

improvement, and Six Sigma. WPI also offers on-line programs in special areas such as Fire Protection Engineering and System Dynamics. The online courses are developed and delivered by the WPI faculty who deliver the same programs on campus.

All planning for courses and programs originates with the faculty in the relevant academic departments. When a department votes to add a course, delete a course, or make changes to an existing degree program, the proposal is sent to the faculty Committee on Academic Operations or the Committee on Graduate Studies and Research. The relevant committee discusses issues such as impact on other programs, adherence to university-wide policies, adequacy of the course description, and the impact on resource allocation. If the committee approves the proposal, it is then forwarded to the full faculty for review.

Proposals for completely new degree programs originate, once again, with the faculty in the associated departments. The Committee on Academic Policy is responsible for reviewing proposals for new undergraduate degree programs or changes to policies that will have an impact on degree programs. The Committee on Graduate Studies and Research reviews proposals for new graduate programs. If the relevant committee approves the proposal, it is then forwarded to the full faculty for review.

When proposals for new courses or programs come to the full faculty, the departments advancing the proposals are expected to demonstrate the merits of the curricular change, discuss the impacts on other programs, and identify the resources needed to deliver the new course or program. When the faculty approves a change to an existing program, the WPI practice is to make the change binding on the first set of students that enters under the new description in the next published catalog. Students currently enrolled when the change is made have the option to apply either the new or existing policies. When courses are dropped, the associated department either provides an independent study for the deleted course or identifies an equivalent course to satisfy the new requirement.

Print versions of the graduate and undergraduate catalogs are issued annually and contain detailed information on admission, academic policies, financial aid, and academic advising, along with course descriptions. All catalogs are reviewed annually by the Provost's Office, the faculty Committee on Academic Operations, department heads, and the Registrar's Office. Significant changes and updates to the catalog, including updates to the print catalog and experimental courses (32 experimental courses are offered in academic year 2011–12) are made available in the supplemental section of the online catalog.³

Undergraduate Programs: Description

WPI's 14 academic departments offer 31 Bachelor of Science and two Bachelor of Arts programs. About 90 percent of WPI students major in a science or engineering discipline.

In fall 2010, there were just over 3,400 full-time students distributed among the 33 undergraduate majors, with nearly 400 students pursuing double majors. More than 750 bachelor's degrees were awarded during that academic year.

More than 1,900 students (55 percent of all undergraduates) declared a major in an engineering discipline, with the two largest groups being Mechanical and Biomedical Engineering:

- | | |
|---------------------------|-------------------------------------|
| 1. Mechanical Engineering | (602 enrolled, 146 degrees awarded) |
| 2. Biomedical Engineering | (340 enrolled, 57 degrees awarded) |

³ Supplements are online at www.wpi.edu/academics/catalogs/ugrad/supplement.html and www.wpi.edu/academics/catalogs/grad/supplement.html.

WPI's undergraduate engineering programs (including the interdisciplinary program in Environmental Engineering) were reviewed by the Accreditation Board for Engineering and Technology (ABET) in 2009 and received full accreditation. The newest interdisciplinary program, Robotics Engineering received initial accreditation by ABET in 2011.

Almost 950 students (about 28 percent of undergraduates) were majoring in one of the science disciplines, including Computer Science and Mathematical Sciences, in fall 2010. The two largest majors were Computer Science and Biology and Biotechnology:

1. Computer Science (235 enrolled, 69 degrees awarded)
2. Biology and Biotechnology (206 enrolled, 53 degrees awarded)

There were 189 students with a major within the School of Business (including Management Engineering and Industrial Engineering) and 50 students graduated with a BS in one of these majors last year.

The smallest groups of majors at WPI are found in the Humanities and Arts and the Social Sciences. For example, in spring 2011 there were eight students majoring exclusively in the Humanities and another 30 whose double major included Humanities and Arts. WPI's first Bachelor of Arts degree program, Liberal Arts and Engineering, was introduced in 2006 and a BA in Environmental and Sustainability Studies was added in 2008. The first student to complete a BA degree graduated in 2009 and four students received BAs in 2011.

WPI has added several majors to the undergraduate program during the last 10 years; almost all of them are interdisciplinary. Interactive Media and Game Development is a program at the intersection of Computer Science and the Humanities and Arts. Robotics Engineering, the first such bachelor's degree program in the United States, connects Computer Science, Electrical and Computer Engineering, and Mechanical Engineering. It graduated its first major in 2008 and received ABET accreditation in 2011. Interdisciplinary programs have grown rapidly, and enrolled just over 12 percent of undergraduates in 2010-2011. The following are the largest interdisciplinary programs at WPI:

1. Robotics Engineering (206 enrolled, 39 degrees awarded)
2. Interactive Media and Game Development (132 enrolled, 37 degrees awarded)

Even though students may declare a major when applying to WPI, the major is not used in the admission decision; students are admitted to WPI, not to a major or a school. It is easy to change majors, and academic advising during the first year is designed to encourage students to keep their options open. About half of WPI students do change their major (at least once) during their academic career. In fact, the largest single group of majors among first-year students declare themselves to be "undecided."

Capstone Project Work

Project work is at the heart of the WPI Plan and three capstone projects define (and assess) the primary learning goals for our students. This curriculum, first approved by the faculty in 1970, establishes a balance between qualification in the student's major, qualification in the humanities or arts, and qualification in the zone between technology and society, where most real-world problems reside.

Disciplinary Capstone: Major Qualifying Project (MQP). This is a professional-level project, requiring about a quarter of the senior year (9 credits), which establishes qualification in the student's major discipline. Many of these projects are performed in conjunction with industrial sponsors, off-campus research organizations, or ongoing faculty interests. All project students (working individually or, more typically, in

teams) submit formal written reports that are reviewed by the faculty advisors and then, typically, are available for public review. A campus-wide Project Presentation Day is held each April, during which nearly every MQP student makes a formal public presentation of his or her work to faculty, students, project sponsors, and visitors.⁴ Departments regularly review student project reports as part of outcomes assessment for both program-level and institution-wide assessment.

Interdisciplinary Capstone: Interactive Qualifying Project (IQP). The IQP establishes the qualification in the area between technology and society. Involving about a quarter of a year (9 credits), this powerful project experience, unique to WPI, requires the solution of a problem at the interface of science or technology on the one hand, and human values or social concerns on the other. Many of these projects are conducted at off-campus sites. About half of students complete the IQP through the Global Perspective Program, which provides project opportunities around the world, including at residential project centers (staffed by WPI faculty) located in Europe, North America, Latin America, Asia, and Australia.

In 2009-10, 755 students completed IQPs, which were advised by 123 different faculty advisors. It is important to note that faculty from 14 different academic departments were involved as project advisors or project center directors during that year. The Director of Academic Programs and the Interdisciplinary and Global Studies Division maintain a website with a list of faculty project proposals.⁵ Some of the project ideas are based on faculty research interests; many more come from external organizations or build on previously completed projects. It is also common for students to propose a project in an area of their own interest and meet with faculty to develop the idea into an acceptable IQP.

Humanities and Arts Capstone: Inquiry Seminar or Practicum. This is the culmination of each student's individual plan of study in the Humanities and Arts. While about 90 percent of undergraduates major in engineering or science, 100 percent of WPI's undergraduate complete the equivalent of a minor in the Humanities and Arts.

As a capstone experience, the Inquiry Seminar is intended to help students take their knowledge of the humanities to a deeper level. The purpose of the seminar is not to provide a broad survey or general introduction to a given discipline, but, building on the understanding of that discipline acquired in prior courses, to provide a structured forum in which students 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.

The Practicum shares the same goals and objectives as the Inquiry Seminar but provides students with a production/performance experience that emphasizes the hands-on, practical application of skills and knowledge gained from a sequence of Humanities and Arts courses. Samples of practicums in music include composing, arranging, or performing a solo recital. Drama/Theatre students may choose to act in, direct, or design a campus production. More than 100 undergraduates participated in eight original plays, all written, directed, and performed by members of the WPI community, in *New Voices* in April 2011. *New Voices* is now the country's longest continuously running university new plays festival.

These three capstone projects define what we value in a WPI education, what we expect and will help students achieve. Completed projects are one of the primary resources used in assessing students learning. Since 2007, all completed MQPs and IQPs have been submitted to a searchable, online database, the eProjects website.⁶

⁴ Programs from recent Project Presentation Days may be found in the Workroom. The 2011 program is online at www.wpi.edu/news/ppd.html.

⁵ www.wpi.edu/academics/Projects/available.html.

⁶ www.wpi.edu/+eprojects.

These “born digital” documents are almost all publically available. Occasionally, when a project report completed for an external sponsor includes proprietary information, it will not be accessible for a specified period. Almost 1,400 IQPs and more than 1,660 MQPs have been submitted to the database. During the last academic year alone, the library tracked more than 240,000 downloads of IQP and MQP reports by internal and external audiences.

Course Work and Credit

Preparation for these ambitious project requirements is provided by a strong curriculum of courses taught by faculty who are committed teachers with active research programs. There are several distinctive features of the undergraduate program in place to support the capstone project system described above.

First, the emphasis on project work requires a high level of teamwork and collaboration and the university has an unusual grading system designed to support this emphasis. The only grades assigned for classes and projects are A, B, C, or (if the work is not acceptable) NR. NR stands for “No Record” and it does literally mean that there is no record on the transcript that the student was enrolled in the course. WPI does not record “punitive” grades (Ds or Fs). The system was put in place primarily because the faculty wished to create a culture where peer teaching and learning would be supported to the fullest degree. Such a cooperative atmosphere is especially important in project work, where the majority of projects (IQPs and MQPs) involve 2 to 4 students.

Second, WPI divides the academic year into four seven-week terms (two in the fall and two in the spring) and a standard course schedule is three courses in each term. Every undergraduate course carries 1/3 unit of credit (with few exceptions) and the undergraduate catalog specifies that 1/3 unit should involve 15 to 17 hours of work each week of time on task, regardless of the time in lecture or conference or lab. The same expectation is defined for project work, where there are almost no traditional “contact hours” and certainly no lectures. Students must learn to take responsibility for their own learning and we give them that responsibility in every course.

The term system was established specifically to facilitate project work and, in particular, off-campus project experiences. An IQP or MQP can be the full academic load for one term, enabling student to leave campus to complete these projects, from beginning to end, in one term of full-time immersion. The same option is available to students doing on-campus project work, although they chose this option infrequently. When a project extends over multiple terms, the standard schedule is two courses in addition to project work, so the project remains a significant focus for the students.

The basic graduation requirement is 15 units of undergraduate credit, of which a minimum of eight units *must* be completed while enrolled at WPI. One free unit (16 units would be a full four-year program), along with an additional unit of free electives within the 15-unit requirement, provides flexibility to the student’s academic plan.

To communicate with the outside world, for purposes of accreditation and transfer of credit, WPI translates its system of units into undergraduate credit hours:

$$1/3 \text{ WPI unit} = 3 \text{ undergraduate credit-hours.}$$

For the rest of this discussion, we will express credit for courses and projects using the more traditional credit-hour system. In other words, almost all undergraduate courses carry 3 credits, each qualifying project (IQP and MQP) carries 9 credits, and 135 credits are required for graduation.

Of the 135 credits required for graduation, nine are designated as free electives. Of the 126 remaining credits, 54 are specified within the major (this includes the 9-credit Major Qualifying Project). The remaining 72 credits fall into six categories:

1. Interactive Qualifying Project: 9 credits
2. Humanities and Arts: 18 credits
3. Mathematics and Science: 18 credits
4. Social Sciences: 6 credits
5. Physical Education: 3 credits (in four 3/4-credit courses)
6. Distribution Requirements: 18 credits specified by major.

The IQP can be considered the heart of general education at WPI. IQPs are advised by faculty from all departments and disciplines, and the projects are regularly assessed to assure that the degree requirement supports the institutional learning outcomes for all students.

The Humanities and Arts requirement was changed significantly in 2008, following the work of Presidential Commission A2 (described in the chapter on Standard Two). The number of credits did not change, but the Humanities and Arts faculty added structure to guide students in course selection by grouping courses into three intellectual clusters. These clusters are roughly divided into language and literature; the fine and performing arts; and history and philosophy. To ensure depth of understanding, students must complete at least half of their humanities and arts work (including the final capstone seminar or practicum) in one focused area within a single cluster. To ensure a measure of breadth, they must complete at least one course in a different cluster.

There is one exception to the structure defined above for the Humanities and Arts requirement. Students may satisfy the requirement with a six-course sequence of study in a foreign language. (German and Spanish have long been taught at WPI and experimental courses in Arabic and Mandarin Chinese are being offered for the first time in 2011. Other languages are available through the Colleges of Worcester Consortium.)

The (18 credit) Mathematics and Science requirement was new in 2010, but only in the sense that it gave an explicit articulation of WPI's educational values. The vast majority of programs require many more than 18 credits in science and math. The Committee on Academic Policy found only two exceptions: Actuarial Mathematics (where management science courses took the place of courses in the physical sciences) and Biology and Biotechnology (where the program considered an advanced biology course that focused on applied statistical analysis to fulfill the requirement).

Even though WPI rarely uses the term “general education” in internal discussions, as many as 54 of the credits described in the graduation requirements above (all except the 18 credits prescribed in distribution requirements by the major) meet the defining quality of general education.

Global Learning and Great Problems

Part of WPI's mission is to help students gain a mature understanding of themselves and, most important, to form a deep appreciation of the interrelationships among basic knowledge, technological advance, and human need. In a world that is growing ever smaller and more connected, the ability to place this mission in a global context is crucial.

The Global Perspective Program

WPI's project-based curriculum and seven-week academic terms allow students to complete one or more of their required projects off campus through the Global Perspective Program. The program enables full-time immersion at one of more than 20 WPI Project Centers located in Africa, the Americas, Asia, Australia, and Europe. By focusing its off-campus activity on the required projects, WPI has been able to send more engineering and science students abroad than any other U.S. university. Over 8,000 students have completed off-campus projects since the program began nearly 40 years ago.

Off-campus project centers are of three types, corresponding to the three required capstones of the WPI Plan. At IQP centers, students complete interdisciplinary team projects for local government agencies, NGOs, and nonprofits. At MQP centers, students complete design or research projects in their major for the private sector and research laboratories. At Humanities and Arts centers, students complete the final 9 credits toward their Humanities and Arts requirement, generally via a combination of course work, independent study, and creative original work. A list of the project centers in operation in 2010-11 follows:

Off-Campus IQP Centers, 2010-11 <ol style="list-style-type: none">1. Melbourne, Australia2. San Jose, Costa Rica3. Copenhagen, Denmark4. Venice, Italy5. Windhoek, Namibia6. Hong Kong, PRC7. Cape Town, South Africa8. Bangkok, Thailand9. London, UK10. San Juan, PR11. Washington, DC12. Boston, MA13. Nantucket, MA14. Worcester, MA	Off-Campus MQP Centers, 2010-11 <ol style="list-style-type: none">1. Nancy, France2. Limerick, Ireland3. Wuhan and Shanghai, PRC4. London, UK5. Budapest, Hungary6. Silicon Valley, CA7. MIT Lincoln Laboratories, MA8. Wall Street, NY
	Humanities & Arts Centers, 2010-11 <ol style="list-style-type: none">1. Ifrane, Morocco2. London, UK

The Global Perspective Program helps WPI students apply what they have learned in their studies while developing an understanding of the complexities of global problems. The program's goals are to instill in WPI students and faculty an appreciation of difference and an ability to interact effectively with other peoples and cultures; the ability to apply their skills and knowledge across disciplinary, geographic, and political boundaries; and an understanding of themselves and what roles they might play—professionally and personally—in an increasingly interconnected world. The opportunity to complete the required projects off-campus helps students understand the social and cultural contexts of technical problems, since the students become immersed in local culture while providing solutions for their sponsors on issues of local importance. In order for students to develop the appropriate solutions, they must first develop an understanding of the local agency/organization and the community.

Student work at each project center is directed by WPI faculty members. The most common model (typical for IQPs) involves a cohort of 24 to 28 students, accompanied by two residential faculty advisors. Teams of three to four students each tackle a different project for a different local sponsor. Each project center has a faculty director who sets the center's research agenda, develops ongoing relationships with project sponsors, and works with WPI's Interdisciplinary and Global Studies Division to attend to housing, transportation, and logistics.

As mentioned, project centers usually have distinct research agendas. For example, the center at Cape Town, South Africa, has focused specifically on sustainable development in informal settlements where many people live in shacks or other substandard housing with inadequate services. In 2009, WPI celebrated the 20th anniversary of its Venice (Italy) Project Center, where more than 120 projects have been completed on topics ranging from archeological and analytical study of Venetian church floors to studies to promote the awareness and conservation of public art in the city.⁷

To prepare students for their seven weeks at an off-campus IQP center, students complete a seven-week, 4.5 credit preparation course that guides them through the process of project formulation, background research, and proposal development. The course introduces methods for social science research and field skills for the specific projects each team will complete, and also focuses on the development of teamwork and communication skills. The course may also include some basic language skills and a study of the host culture.

In order to make the program affordable for students, each project center has an operating budget that supports faculty involvement and other administrative expenses, so students pay only their own direct costs (housing, transportation, food, etc.). As undergraduate enrollment has grown, so has participation in the Global Perspective Program:

Type of Experience	2007-2008	2008-2009	2009-2010	2010-2011
Off-campus IQP	323	349	357	423
Off-campus MQP	96	87	97	89
Off-campus HUA	27	13	15	10
Other	45	36	32	25
# of experiences	491	485	501	547
% of graduating class going off-campus	55%	59%	60%	53%
% going overseas	40%	46%	40%	45%

In addition to the pedagogical goals of the IQP discussed above, another invaluable outcome of this project, particularly when completed at an off-campus project center, is the element of community service embedded within it. While service learning, which integrates meaningful community work with disciplinary knowledge, has become popular in the past two decades, its theoretical roots can be traced to John Dewey's writings on education and social philosophy from the early 20th century. Since 1970, WPI's IQP program has taken as axiomatic Dewey's idea that local communities and their particular challenges could provide valuable educational laboratories for students learning to work together to solve real-world problems. As our program has matured, our students have discovered the converse: that knowledge and informed engagement can help overcome the social ills that often plague communities. While students at many high schools and colleges routinely volunteer their time at nonprofit agencies and other community-based organizations, at WPI the element of community service is built into our curriculum and required of all students. The most impressive IQP projects not only reveal remarkable student ingenuity, communication, and cultural sensitivity, but they

⁷ The website venice2point0.org provides a comprehensive survey of the work completed at the center.

also constitute major improvements in the communities where they are based. Student projects based in rural Namibia, an informal settlement of Cape Town, South Africa, or, indeed, in Worcester often provide their communities with engineering projects that would have cost thousands of dollars if done professionally. Since students not only complete their projects but also remain on site long enough to present their findings or designs to their project sponsors, they get direct experience of the pleasure that comes from seeking and finding ways to make the world, in John Dewey's words, of more "worth and significance, more homelike, in fact."

The First Year Experience: Great Problems Seminars

More than 10 years ago, the faculty had recognized that the first-year program was not living up to the excitement and challenge of the WPI Plan. Students came to WPI because of the projects and found themselves in a traditional sequence of first-year courses. Data from the National Survey of Student Engagement showed that in contrast to WPI's highly engaged fourth-year students, first-year students reported less academic challenge, less class participation, less teamwork, less progress in communication and critical thinking, and less tendency to work hard than first-year students at other doctoral-intensive institutions.

Presidential Commission A-1 on General Education and the First Year Experience issued its report in 2005,⁸ laying the foundation for significant changes to the first year. This was followed by the Committee on Academic Policy subcommittee on general education and the first year, which proposed the *Great Problems Seminars* as a dynamic solution to campus concerns about the lack of stimulating academic opportunities during the first year. Each Great Problems Seminar (GPS) has at its center a significant global problem, selected in part because it is clearly NOT disciplinary in nature. The selected global problems have societal and technical components, and always involve more than one academic discipline. So far, we have piloted seminars with a focus on energy (Power the World), food (Feed the World), health care (Heal the World), and sustainable development (Grand Challenges). Each seminar typically enrolls 60 students, but achieves some of the intimacy of a smaller seminar through group project work.

Each GPS is equal to two courses, spans two terms, and is led by faculty from two different departments. Students receive credit in appropriate disciplines. For example, students in Feed the World receive credit for one course in Chemistry and one course in Humanities. The key assignment in each GPS is to work in a small team on an aspect of the great problem to provide more insight or investigate solutions. However, before first-year students set out on that mission, they receive appropriate preparation. In the first of the two terms, students and faculty explore the depth and breadth of the problem, introducing perspectives from a variety of different disciplines, including, but not limited to, the two disciplines represented most immediately by the instructors. Students practice using information sources, working in teams, and presenting materials, in order to learn how to perform each of these activities with increasing facility and effectiveness.

The second half of the course is devoted to project work. With faculty guidance, teams of three to five students perform an in-depth analysis of some aspect of the great problem, and try to frame a partial solution based on their investigations. Seminars culminate in a joint Project Presentation Day in which all groups present posters describing their projects. Each team is also required to produce a substantive written project report. Successful project teams demonstrate fluency in analyzing a technical component, as well as awareness and assessment of the socio-political circumstances and economic impact of the problem.⁹

⁸ Included in the Workroom and at www.wpi.edu/offices/president/general.html.

⁹ More information available at www.wpi.edu/academics/Undergraduate/FirstYear/gps.html.

This focus on a substantial team-based project as a key first-year curricular element aligns with WPI's project-based undergraduate curriculum. The project experience in the GPS is a mechanism to impart skills that will serve the students well as they enter the higher stakes projects, the IQP and MQP. As this course, like the IQP, requires students to acknowledge and appreciate the societal and humanistic contexts in which these problems reside, it is also a powerful introduction to one of the key values of a WPI education. In fact, the GPS program embodies six of the eight stated values for undergraduate education at WPI, and helps students work toward seven of the 10 undergraduate learning outcomes (defined below).

Assessment has been done in each of the first four years of the pilot and has demonstrated that the Great Problems Seminars fulfill their objectives of engaging first-year students and providing them with a foundation of information literacy, teamwork, and communication skills that serve them well throughout their time at WPI.¹⁰

Undergraduate Programs: Appraisal and Outcomes Assessment

Assessment is part of the culture at WPI. From its beginning, more than 40 years ago, the WPI Plan did not have the usual structure of required courses that could be used as a proxy for measuring what students had learned. Student performance in the required projects (IQP, MQP, and the Humanities and Arts project) has been the primary measure of student learning.

During the 1980s, the faculty began regular review of student achievement embodied in project reports to assess the quality of pedagogy in the academic program. In preparation for re-accreditation visits in 2001 (NEASC and AACSB) and 2002 (ABET), a Student Outcomes Assessment Steering Committee (SOASC) was created by President Edward A. Parrish to coordinate a university-wide review of student learning outcomes and methods for assessing student progress toward those outcomes. This committee created the foundation for the outcomes assessment plan in use today.

WPI has learned a great deal about outcomes assessment since the 2001 self-study for NEASC and more recent ABET reviews. Today, the university has articulated learning outcomes at several levels and has assessment plans in place for each set of outcomes:

- Undergraduate Learning Outcomes (2004)
- IQP Learning Outcomes (2007)
- Humanities and Arts Learning Outcomes (2004; updated 2007)
- MQP Learning Outcomes (2009)
- Program Learning Outcomes (various dates from 1996 through 2010)

The first three of these are “university-wide” and involve all undergraduate students, regardless of major. The last two provide the particular disciplines’ views of learning in the major, but they still support the broader institutional outcomes.

¹⁰ These assessments are available in the Workroom.

Institutional Learning Outcomes

The WPI faculty developed the following list of Undergraduate Learning Outcomes,¹¹ which was adopted by the faculty in 2004:

Undergraduate Learning Outcomes: *Graduates of WPI will...*

1. have a base of knowledge in mathematics, science, and humanistic studies.
2. have mastered fundamental concepts and methods in their principal areas of study.
3. understand and employ current technological tools.
4. be effective in oral, written, and visual communication.
5. function effectively both individually and on teams.
6. be able to identify, analyze, and solve problems creatively through sustained critical investigation.
7. be able to make connections between disciplines and to integrate information from multiple sources.
8. be aware of how their decisions affect and are affected by other individuals separated by time, space, and culture.
9. be aware of personal, societal, and professional ethical standards.
10. have the skills, diligence, and commitment to excellence needed to engage in lifelong learning.

The outcomes were developed, and adopted, along with an outcomes assessment plan that included a “matrix” defining criteria, *data sources*, an *evaluator*, and a *schedule* for detailed assessment of each learning outcome. With the assessment plan, the faculty approved the creation of the Undergraduate Outcomes Assessment Committee (UOAC) as a standing committee in the faculty governance system in 2003. UOAC meets weekly during the academic year to review assessment information, plan for future assessment, and report to the faculty Committee on Academic Policy when outcomes data indicates the need for program or policy review.

The assessment matrix includes a total of 46 criteria associated with the 10 Undergraduate Learning Outcomes and each criterion has an associated data source. Student projects, especially the final written reports, are reviewed regularly by the faculty and these reviews provide assessment data for six of the 10 outcomes. Faculty members who advise projects are also surveyed regularly to obtain their assessment of student growth in the appropriate learning outcomes (which cannot be assessed with only the final report) and their achievement of the outcomes. Student responses on national surveys (including the National Survey of Student Engagement (NSSE), with comparison to an appropriate group of peer institutions, are reviewed regularly by UOAC. The results are reported to the faculty Committee on Academic Policy, the Department Heads, and the full faculty.

¹¹ Undergraduate Catalog and on the web at www.wpi.edu/offices/policies/outcomes.html.

The following table shows some of the details of the assessment plan associated with part of Outcome 4: *WPI students will be effective in written communication.*

Criterion	Data Source	Evaluator	Schedule
WPI mean for the relevant NSSE question is at or above that of AITU	NSSE, Item 11c (<i>Text of item available in Appendix C</i>)	Dean of Undergraduate Studies	At least triennially
All MQP reports are judged at or above the acceptable level with respect to writing quality	Departmental MQP review	Department Program Review Committee	Biannually
All IQP reports are judged at or above the acceptable level with respect to writing quality	Institutional IQP Review Item 7a Item 7b Item 7c	IGSD	At least triennially
90% of HUA Project advisors responding to the relevant survey item "agree" or "strongly agree" that "the student writes clearly and correctly"	Advisors' Sufficiency review conveyance question #1	Humanities and Arts Department	Biannually
90% or more of responding alumni (from recent class surveys) rate their WPI preparation as "adequate" or better	Alumni Survey, Part II, relevant item for section 5b	Departments	At least triennially

Note that some of the language in the Outcomes Matrix became outdated with the change in the Humanities and Arts Requirement. The department is currently developing assessment plans for the Inquiry Seminars and Practicums. UOAC will be reviewing the matrix again during the 2011-12 academic year.

During the most recent academic year, UOAC took the following actions related to program assessment:

- UOAC reviewed departmental MQP reviews and Self-Study reports to summarize data on the quality of student writing (Outcome 4a). The committee met with faculty from the Writing and Rhetoric group in Humanities and Arts to discuss the data.
- UOAC reviewed survey data related to Outcome 8 (how decisions affect others). Trends in the data indicated that WPI students' attitudes toward diversity have improved over the last few years, perhaps mirroring the improved diversity in the undergraduate population.
- UOAC reviewed survey data, including NSSE and Educational Benchmark Incorporated (EBI) data, relevant for Outcome 9 regarding student development of ethical standards. In 2010, UOAC issued a report comparing results for the different departments and organized a "Food for Thought" presentation (part of the regular series of events offered by the Morgan Teaching and Learning Center) on ethics in the undergraduate curriculum. Members of a panel representing three departments described their experiences in incorporating ethics into the curriculum and assessing student achievement of this outcome.

- UOAC summarized data from the National Survey of Student Engagement (NSSE) for the Outcomes Assessment Matrix and identified criteria where WPI student responses were below the Association of Independent Technological Universities (AITU) benchmark. In particular, WPI students reported lower levels of active and cooperative learning in courses than the level reported by AITU peers.
- UOAC reviewed and summarized student satisfaction data (collected in a biannual survey by the Office of Student Affairs) connected to all aspects of academic advising at WPI. While student satisfaction remained high and above benchmarks in almost all academic areas, results for a group of questions related to academic advising had shown a decrease from 2006 to 2008. A report on this subject was provided to the faculty, the academic department heads, and the Academic Planning Committee of the Board of Trustees.

One of the main contributions of the original UOAC assessment plan was the identification of key areas for which WPI *lacked* good data sources. For example, the committee recommended that departmental MQP reviews be expanded to include a focus on oral communication. Most departments now include a regular review of MQP presentations at the annual Project Presentation Day as part of their assessment plan.

Learning Outcomes for the IQP

Learning outcomes designed to measure the impact of the IQP were approved by the WPI faculty in 2007.¹² Note that each of the IQP outcomes below is mapped “up” to one or more of the Undergraduate Learning Outcomes (the numbers in parentheses correspond to the institutional outcomes). The IQP has an impact on eight out of the 10 institutional learning outcomes. (The IQP does not contribute directly to Undergraduate Outcomes 2 and 3, which focus on disciplinary learning.)

Students who complete an Interactive Qualifying Project will...

1. demonstrate an understanding of the project’s technical, social, and humanistic context. (1, 7, 8)
2. define clear, achievable goals and objectives for the project. (6)
3. critically identify, utilize, and properly cite information sources, and integrate information from multiple sources to identify appropriate approaches to addressing the project goals. (7, 10)
4. select and implement a sound approach to solving an interdisciplinary problem. (7, 10)
5. analyze and synthesize results from social, ethical, humanistic, technical, or other perspectives, as appropriate. (8, 9)
6. maintain effective working relationships within the project team and with the project advisor(s), recognizing and resolving problems that may arise. (5)
7. demonstrate the ability to write clearly, critically, and persuasively. (4)
8. demonstrate strong oral communication skills, using appropriate, effective visual aids. (4)
9. demonstrate an awareness of the ethical dimensions of their project work. (9)

Assessment of student work in IQPs began several years before this list of IQP learning outcomes was officially adopted. For example, a review of all IQP reports was completed by the faculty in 2000 and a focused review of on-campus projects (including those completed at the Worcester Community Project Center) was undertaken in each of the following three years. In 2004, a sample of on- and off-campus projects was reviewed with the specific purpose of comparing the quality of student work (and achievement) for these two options. A sample of only on-campus projects was reviewed in 2007, at which time the evaluation rubric was mapped to the learning outcomes listed above. In 2010, WPI engaged an external consultant to perform a review of student projects.¹³

¹² Online at www.wpi.edu/academics/Depts/IGSD/outcomes.html.

¹³ The 2004, 2007, and 2010 reports are available in the Workroom.

The work of the review committees is summarized in a report presented to the Dean of IGSD, the Dean of Undergraduate Studies, and the Undergraduate Outcomes Assessment Committee (for use in adding information to the Institution Outcomes Assessment Matrix). The results are also returned to the faculty through “Resources for Advisors” published on the IGSD website as part of an extensive collection¹⁴ of materials available there to support project advisors and students. The same results are presented to the WPI community at “Food for Thought” lunches organized by the Morgan Center.

This list of IQP learning outcomes was also used to develop a survey to collect student evaluations of project advising and the project learning experience. Almost all students (about 98 percent in 2009) complete the survey when they submit their final project report through the online eProject¹⁵ system. Note that the purpose of the survey is to assess the quality of project advising and the actual project experience, and the majority of the survey is formative assessment to improve project advising by faculty.

Learning Goals for the Humanities and Arts

Like WPI as a whole, the Humanities and Arts Department has a long tradition of reviewing the outcomes of student project work, beginning long before the process was given the explicit banner of “outcomes assessment.” Department committees conducted reviews of Humanities and Arts projects during the summers of 1992, 1996, 1999, and 2004. The insight gained in these reviews was an important contributor to the discussions that led to the revisions to the Humanities and Arts requirement developed in 2006-2007 and approved by the full faculty for implementation in 2008. The department reviewed the initial student experience with the new requirement in 2009 and developed a four-year plan for a new process of outcomes assessment. A second committee was formed in 2011 to focus specifically on assessment methods for the Practica. Though the educational goals for the Inquiry Seminars and the Inquiry Practica are well aligned, the artifacts collected for assessment are completely different and will require very different methods of analysis.

Learning Outcomes for the MQP

The Major Qualifying Project is the capstone project for the major and the means by which students demonstrate mastery in their chosen discipline. In 2005 the faculty adopted a list of seven learning outcomes¹⁶ tied specifically to the MQP. The interpretation of these outcomes, listed below, is then tailored to each specific major. In addition, individual departments can and do add discipline-specific outcomes to the list, while sharing this common core.

Students who complete a Major Qualifying Project will...

1. apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study. (1, 2)
2. demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study. (2, 3)
3. use effectively oral, written, and visual communication. (4)
4. identify, analyze, and solve problems creatively through sustained critical investigation. (6)
5. integrate information from multiple sources. (7)
6. demonstrate an awareness and application of appropriate personal, societal, and professional ethical standards. (9)
7. practice the skills, diligence, and commitment to excellence needed to engage in lifelong learning. (10)

¹⁴ Online at www.wpi.edu/academics/Depts/IGSD/Advisors/index.html.

¹⁵ Online at www.wpi.edu/+eprojects.

¹⁶ Undergraduate Catalog and online at www.wpi.edu/academics/catalogs/ugrad/mqp.html.

Once again, the numbers in parentheses indicate the Undergraduate Learning Outcomes supported by the particular MQP learning outcome. The MQP supports eight out of the 10 Undergraduate Learning Outcomes, missing Outcome 5 on teamwork (not all MQPs are team projects) and Outcome 8 on global learning. The MQP learning outcomes are used when the departments complete their internal reviews of student project reports. They also guided the development of an end-of-project survey, intended to assess MQP advising and the student project experience, that was developed and piloted by the Committee on Academic Policy during 2010-2011.

Regular summer reviews of completed MQP reports provide one way for new faculty to learn about the WPI Plan, in general, and project advising in particular. It is not unusual for a new (tenure-track) faculty member to be supported during the summer to read and evaluate (using their department's assessment rubric) student projects completed over the past two academic years. The results of these reviews are used internally by departments to improve the MQP.

Program Learning Outcomes

A list of learning outcomes has been developed for each major.¹⁷ These are the frameworks used by departments and programs in reviewing their curricula and the distribution requirements. The assessment plan usually maps key components of the undergraduate program back to the department's learning objectives. For example, the following table is taken from the curriculum activities map for the Chemical Engineering Departments.

Objective	MQP	IQP	HUA	Core Courses	Elective Courses	Concentrations	Unit Ops	Design	AIChE
Fundamental principles of chemical engineering									
Solve practical problems important to society									
Broad education for a successful life									
Effective communicators									

Many departments have more detailed mappings, down to the course, test, and assignment level, to assess very specific disciplinary knowledge. For example, the School of Business faculty adopted a comprehensive Program Level Learning Outcomes Assessment process in 2010 in order to comply with AACSB Assurance of Learning accreditation standards. In their annual reports, departments and interdisciplinary programs are asked to identify any changes they have made in the last year (in individual courses or distribution requirements) based on review of student work and progress toward the program's learning outcomes.

¹⁷ A summary is provided in the E Series forms included in the Appendix to this report.

Undergraduate Programs: Projection

The Revised Strategic Plan has reaffirmed our commitment to the “WPI Plan as the essential core of WPI’s premier, science- and technology-centered undergraduate program.” The Strategic Plan also commits us to “continued enhancement” of the WPI Plan. The following are three areas of review for continued enhancement.

Expand the Great Problems Seminars

There is tremendous energy and excitement around the first-year project work introduced with the Great Problems Seminars (GPS). By expanding the GPS, we can bring the first year into perfect alignment with the project focus of the WPI Plan.

Assessment of the GPS has been strongly positive, but there are significant challenges associated with scaling up to make the experience available to all WPI students. This year we are offering four GPS seminars, which will include approximately 25 percent of the first-year students. (When first-year students began to register for classes in May and June of 2011, all 240 GPS seats were filled quickly, with almost 140 students on waitlists for the seminars.) To make it possible to enroll *all* first years we will need about 18 seminars, which would require significant additional faculty resources. In 2008–09 an *ad hoc* faculty committee was formed to determine the feasibility and develop an implementation plan for making a first-year project experience available to all students.¹⁸ The committee reviewed a number of options, but agreed that the GPS provides exactly the kind of experience we want for first-year students at WPI.

Serving a Larger Undergraduate Population

WPI’s most recent strategic plan called for an increase in the undergraduate population from about 2,800 students to about 3,400 students by 2015, but we have achieved this goal several years ahead of schedule. We must work to assure that the qualities that have attracted students to the university and made this growth possible remain the reality of our programs.

Investments have been made to provide the infrastructure to support the growth, including both academic and non-academic space. For example, the addition of the Life Sciences and Bioengineering Center at Gateway Park and the subsequent renovations in Salisbury Laboratories and Goddard Hall has allowed us to increase the number and quality of classrooms.

2001		2011	
34 classrooms, 19 with computer projection	2,504 seats	41 classrooms, 38 with computer projection	2,931 seats
5 computer labs	170 PCs	8 computer labs	230 PCs

The key features of the undergraduate program, the capstone projects (Humanities and Arts, IQP, and MQP), require intense student-faculty interaction and do not happen in the traditional classroom. More faculty, and new kinds of support for faculty in teaching and advising, are needed.

¹⁸ This report is available in the Workroom.

There is no doubt but that WPI faculty must put in unusual effort to sustain our project-heavy curriculum. One risk of this intense effort might be the erosion of faculty confidence in the institution and its curriculum. But in fact, the reverse has been true: since the beginning of the WPI Plan, and increasingly as our project centers go global, we have found that WPI faculty have developed an intense loyalty to the institution, probably the direct result of their investment in undergraduate teaching and project advising. The WPI faculty suspected as much when they designed the Plan in 1970: to make such a faculty-intensive curriculum work, the faculty must be invested at every point along the way in curricular development and review. That faculty members are willing to serve on time-consuming committees and that they have remained eager to advise student projects is a testament to the wisdom of this particular inefficiency.

Today, more faculty volunteer to advise at project centers than we have available advising slots; in many cases WPI is able to attract top-notch faculty especially because of project center advising. WPI faculty members remain willing to advise because the quality of the undergraduate population has remained high, and conversely the quality of the undergraduate population has remained high because of this faculty involvement in student projects. It's not an efficient system, but it continues to work for us.

Quality of the Interactive Qualifying Project

A great strength of the IQP is that every project is different, and each is truly a collaboration between students and faculty advisors, guided by a problem that is both interesting and important. The interdisciplinary nature of the project and its general education outcomes accommodates a wide range of project topics, advising approaches, and report formats. This flexibility makes it unwise to enforce a standard format or prescribe advisor behavior.

Reviews of IQP reports by trained faculty readers and external evaluators have consistently indicated that students completing projects on campus demonstrate lower levels of achievement than students completing projects off campus. The Interdisciplinary and Global Studies Division has instituted a number of initiatives during the past decade to address this challenge, including extensive online advisor resources, workshops, and seminars for IQP advisors, and a program of matching new advisors with experienced mentors. However, the most successful initiative was to mimic many of the positive features of the off-campus experience on campus through the Worcester Community Project Center (WCPC). Though the students completing projects through the WCPC remain in residence on campus, assessment results suggest they realize learning experiences akin to those demonstrated by students at off-campus residential centers.

Two initiatives are under way to build on that success. One is an expansion of the WCPC to accommodate more students and projects. A second is the creation of an on-campus center organized around the theme of food security in Central Massachusetts, which will be launched during the 2011-12 academic year. If this initiative is successful, additional thematic centers will be pursued.

Graduate Programs: Description

Fourteen academic departments together are involved in offering nearly 60 different graduate degree options. Based on the fall 2010 enrollment snapshot (taken October 1, 2010), there were 1,354 degree-seeking graduate students enrolled at WPI, 528 of whom were studying on a full-time basis and 826 on a part-time basis. This represents a 51 percent increase over the fall 2006 enrollment.

WPI creates and retires graduate programs at a healthy rate. New programs are introduced in response to emerging fields of study, while obsolescent programs are identified and phased out to ensure the best use of resources. Proposals for new programs initiate with the faculty in the academic departments. Among the new programs introduced over the last three years are MS and PhD programs in Robotics Engineering and Learning Sciences and Technologies, a PhD program in Biochemistry, and master's programs in

Interactive Media and Game Development (IMGD) and Bioinformatics and Computational Biology. All except the Biochemistry program assemble faculty from more than one department or fields of study. The IMGD master's program is the first graduate program at WPI to include faculty from the Department of Humanities and Arts. A new PhD program in Business Administration is currently being developed with Entrepreneurship, Information Systems (IS), and Operations Management (OM) concentrations.

During the 2009-10 academic year, WPI awarded 418 graduate degrees, of which 34 were PhDs. The five largest graduate programs in fall 2010:

1. Business (247 enrolled; 69 degrees awarded)
2. Mechanical Engineering (218 enrolled; 85 MS, 9 PhDs awarded)
3. Electrical and Computer Engineering (208 enrolled; 46 MS, 8 PhDs awarded)
4. Computer Science (108 enrolled; 25 MS, 4 PhDs awarded)
5. Fire Protection Engineering (103 enrolled; 36 MS, 1 PhD awarded)

Of the 1,354 degree-seeking students in fall 2010, 810 were enrolled in engineering programs and 249 were studying one of the sciences. The life sciences (biomedical engineering, biology and biotechnology, and biochemistry) were represented by 68 graduate students.

All of the master's degree programs require at least 30 credit hours of study with 10 programs requiring either 33 or 36 credits. Most of the programs have a required thesis (or project) ranging from six to 12 hours. Each of the doctoral programs requires at least 90 credit hours beyond the bachelor's degree, with at least 30 of these credits devoted to dissertation research.

The following table summarizes PhD completions in the past five years:

Department	2005-06	2006-07	2007-08	2008-09	2009-10
Biology/Biotechnology	2	0	0	0	1
Biomedical Engineering	0	1	2	2	1
Chemical Engineering	4	4	1	1	2
Chemistry & Biochemistry	1	2	0	2	2
Civil & Environmental Engineering	0	0	1	2	2
Computer Science	7	4	3	2	4
Electrical & Computer Engineering	4	6	4	5	8
Fire Protection Engineering	1	0	0	0	1
Interdisciplinary	0	1	0	0	0
Mathematical Sciences	1	1	2	1	2
Mechanical Engineering	7	7	2	9	9
Physics	3	1	3	1	2
Total	30	27	18	25	34

Graduate Programs: Appraisal

The graduate program is in many ways much more traditional than the undergraduate program. It does not follow the undergraduate program's seven-week term schedule but uses instead a traditional 14-week semester for almost all of its courses. Graduate courses use a standard (A, B, C, D, and F) grading scheme. There is no interdisciplinary project (such as the undergraduate IQP) at the graduate level.

To increase the visibility of graduate project work and research, WPI launched Graduate Research Achievement Days (GRAD) in 2006. This has provided an opportunity for students to present their research to the WPI community, including faculty, staff, undergraduate students, and external visitors. Even though participation is not required, the event has grown rapidly — from 140 posters in the first year to 230 in 2011. Teams of faculty and visiting judges review the posters and discuss the projects with the students. There are also awards to win, reputations to build, and chances to discover and benefit from what is happening in other labs around campus.

In 2010 the Innovation Presentation competition was added to GRAD. Each student prepares a five-minute “elevation pitch” on their project. The judges select the winners for several categories. These winners give their presentations to a panel of judges, winners are selected and awards given. The presentation judges are composed of entrepreneurs, investors, and IP lawyers.

The graduate program at WPI is making the transition from what was a predominantly part-time program for working professionals (with almost all courses meeting one day a week in the evenings) to a more robust, full-time graduate program strongly tied to WPI's mission of scholarly research. The number of graduate students in PhD programs has grown from about 140 in 2001 to more than 240 in 2011 (data are presented in the Data First forms at the end of this section).

In 2008, the responsibilities of the Office of Graduate Studies and Enrollment were divided between the Office of Graduate Admissions and the Office of the Provost. The Graduate Admissions Office oversees the recruiting of students, marketing of the graduate programs, and the processing of applications, while the Dean of Graduate Studies, acting on behalf of the Provost, oversees teaching assistant (TA) funding decisions, acts as an advocate for graduate student affairs, and adjudicates academic matters that do not require the attention of the Committee on Graduate Study and Research. The Dean of Graduate Studies works closely with the faculty, Academic Department Heads and the Committee on Graduate Studies and Research to develop new graduate programs to meet the needs of our students and industry.

Applications to the graduate program have increased 73 percent over the last two years. While this growth has been led by international applicants, particularly students from China and India, the number of domestic applicants with no prior affiliation with WPI has also grown. The Office of Graduate Admissions has made recruiting such students a top priority.

When the visiting committee reviewed WPI's graduate programs in 2001 they noted, “Graduate students sometimes felt left out.” This sense of isolation was magnified by the lack of coordination between the graduate and undergraduate calendars. For example, most campus services would close during the undergraduate break even though graduate students were still in regular session. Almost all graduate courses are still offered in (traditional) 14-week semesters, but in 2010 the calendars were coordinated so that the start, end, and breaks coincide for graduate and undergraduate students. In addition, several departments are experimenting with seven-week graduate courses to coincide directly with the undergraduate courses. This change also provides more scheduling flexibility for our BS/MS students.

In 2001, about 25 students were pursuing a combined BS/MS program in which students may double-count a limited number of advanced undergraduate courses toward a master's degree. Since then, student participation in the combined program has grown more than fourfold. Some of that growth may have been driven by the tight job market (undergraduates who do not get immediate job offers are more likely to continue their studies), but it is also attributable to the competitive advantage that the master's degree provides for career advancement. WPI introduced a graduate tuition incentive program (in February 2009), which caps graduate tuition at nine credits for the first year of MS degree study; full-time students may take up to 18 credits for the cost of nine. This benefit is also available to WPI alumni who completed the bachelor's degree within the last five years.

In the 2001 Self-Study, much of the discussion concerning graduate programs focused on programs offered at the Southborough and Waltham branch campuses. Those campuses have since closed and the heart of the graduate program returned to the main (and only) campus. WPI does still offer selected programs at off-campus sites, but these are designed and delivered for select corporate partners (see the section on Continuing and Professional Education below).

Given the emphasis on research in the undergraduate projects, many WPI faculty strive to structure undergraduate, graduate, and sometimes postdoctoral research into a vertically integrated program with students tackling those parts of a large-scale problem appropriate to their background and interests. This integration is also seen in the classroom where roughly 100 undergraduate and graduate students work together in both 4000-level undergraduate classes and graduate classes. Through such integration, graduate students not only enrich the educational experience of our undergraduates, they are also shaped by WPI's signature culture of academic collaboration and teamwork. Undergraduates are encouraged (by academic advising, increased undergraduate credit for graduate courses, and a tuition incentive in the fifth year) to build a program that begins graduate work in the senior year and results in both a BS and an MS within five years.

WPI unveiled a new online application in Fall 2009. This was the first step in a transition to a nearly paperless application process for graduate study. Since Fall 2010, all paper documents (chiefly transcripts) have been processed at a scanning and indexing facility in Canton, Mass., which has decreased the time it takes to prepare an application for review. The new user-friendly application has reduced the number of application errors. It presents sets of questions that change depending on the applicant's background. For example, a current WPI student will see a different set of questions than an international student. In fact, current WPI students and alumni enjoy a streamlined application that ushers them along a clear, smooth path. In 2009, the Vice Provost for Research introduced a streamlined transition process for qualified MS students who decide to pursue a PhD at WPI. Rather than submit a full application, they may now petition the head of their department for admission to the PhD program. If the request is granted in the department and approved by the Dean of Graduate Studies, the student is automatically admitted to the program.

The faculty voted in 2010 to change the "exchange rate" between graduate and undergraduate courses. The old policy was that a 1/3-unit undergraduate course would count as three graduate credits on the student's graduate transcript. An undergraduate enrolled in a 3-credit graduate course received 1/3 unit of undergraduate credit. With the policy change, an undergraduate student enrolled in a 3-credit graduate course will, starting in August 2011, receive 1/2 unit of undergraduate credit. (When undergraduate units are translated into credits for external communication, the undergraduate will receive 4.5 undergraduate credits for the 3-credit graduate course.) In the other direction, graduate students enrolled in a 1/3-unit undergraduate course will receive two graduate credits, not three.

This change in policy has introduced some logistic challenges (for determining overloads and overload fees, and determining full-time status to satisfy residency requirements); it will require significant changes to WPI's existing business processes over the next year.

Graduate Programs: Projection

For the foreseeable future, the greatest enrollment growth in campus-based programs will come from master's programs in the engineering disciplines and in the School of Business. Recently, applications for our programs in mathematics—particularly Financial Mathematics—and the fledgling graduate program in Robotics Engineering have increased at substantial rates.

While applications for WPI's PhD programs have grown by 40 percent over the past four years (from 480 for fall 2007 to 674, and counting, for fall 2011), the number of new, enrolling PhD students has remained flat, largely due to limited funding. In spring 2011, the Board of Trustees approved a tiered system for supporting TAs, giving departments the ability to award higher (and more competitive) stipends to the most talented applicants. It is too early to tell whether these more generous stipends have improved the yield. As of this writing, 68 PhD students have accepted an offer of admission (out of 359 admitted), but only 29 are funded; the actual enrollment will not be known until classes begin in August.

WPI has made increasing the number of PhDs awarded each year from an average of 25 over the past five years to 50 each year by 2020. This will be accomplished by focusing the WPI resources of TAs and Fellowships on outstanding PhD students. In addition, the number of WPI students who apply for federally funded fellowship will increase. Finally, an increased number of research proposals will be submitted to support PhD students.

The growth of WPI's reputation as a center for research, and thus as a destination school for graduate students, will depend to a great extent on the growth and quality of its PhD programs. As the university looks ahead 10 years, it will need to find new ways to cultivate the excellence of its PhD programs and to reassess their strategic role.

The past two years have seen impressive growth in master's applications. In Electrical Engineering, for example, applications jumped from 178 for Fall 2007 to 524 for Fall 2011. The departments of Computer Science, Mathematical Sciences, and Mechanical Engineering, along with the School of Business, have seen similar increases. As noted above, nearly all of this growth can be attributed to applications from China and India, where WPI's reputation in engineering is well established.

In spite of the thriving research programs, graduate enrollment in the life sciences has remained flat for several years. This steady state can be attributed, in part, to WPI's nascent reputation in these fields, particularly overseas. Furthermore, because the graduate programs in departments like Biology and Biotechnology and Chemistry and Biochemistry are laboratory-based, there is a physical limit to the number of new graduate students that can be accommodated each year.

WPI's recruiting strategy for graduate students is guided by three goals: to further increase the overall quality of the applicant pool; to increase the number of domestic applicants, particularly those who do not have a prior affiliation with WPI; and to diversify the applicant pool with respect to national origin, racial and ethnic heritage, and gender. We have had some success attracting more domestic students to our campus. Identifying high-quality applicants who 'fit' WPI's culture takes precedence over collecting applications simply to increase our selectivity and raise enrollment. In fact, the current volume of applications has become a serious challenge for review committees in some departments.

Corporate and Professional Education

The mission of the Corporate and Professional Education Division (CPE) is to provide workforce development on behalf of business and industry. Consistent with WPI's larger mission of preparing students for fulfilling careers in science, engineering, and/or technology-driven industries, CPE provides a knowledge-rich, blended-learning environment that offers its students the best in both online and classroom education. The CPE program is also consistent with WPI's mission to transform students into lifelong learners.

The CPE program is designed for flexibility and can be highly customized to service the professional and academic development of career professionals by offering a blended mix of class time, online curriculum, personal instruction, team-based projects, and self-directed learning. The intent, which has been highly successful, is to create an intense learning environment that fits within the busy schedule of mid-career professionals.

CPE's educational programs can also be highly customized for individual organizations, as the CPE department works closely with its corporate clients to address an organization's collective learning needs, as well as its specific business objectives. Through this customization, CPE offers personalized education and workforce training that can dramatically improve an organization's performance and knowledge base for today's rapidly shifting global marketplace.

Similarly, the CPE program offers a rigorous Executive Education tract, designed to turn high-performing executives into visionaries who are capable of working across boundaries, building unity and alignment, living company's values, and inspiring success. Highly successful companies know that tomorrow's success depends upon creating organizational leaders with the vision to lead, inspire, and know.

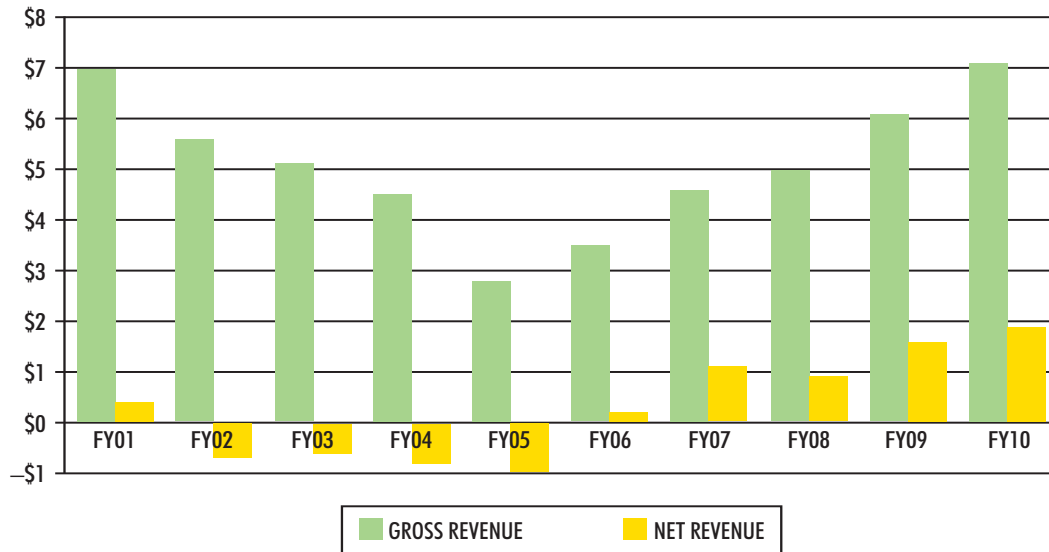
CPE's educational approach benefits both individual professionals and corporate customers alike by offering the same breadth of educational resources that WPI offers its undergraduate and graduate students. All CPE students are given full access to the WPI Portal, which provides complete access to the Gordon Library and other research materials, including online journals, serials, business periodicals, and student and faculty research. Likewise, CPE students can visit the campus at anytime and have full access to the Gordon Library and all other learning resources available on campus, including face-to-face visits with faculty.

A strong portion of CPE's success is achieved through its robust online programs, which mirror WPI's regular academic course work in quality, in depth and breadth, in scholarship, in being a project-based, team-learning environment, and of course, through excellence in teaching.

CPE Appraisal

A key indicator of CPE success is overall growth of the program as well as repeat business. As shown in the graph on the following page, the CPE program has enjoyed six years of continuous growth. After five straight years of decline, CPE annual revenues have more than doubled over the past five years, rising from less than \$3 million in FY05 to more than \$7 million in FY10. Likewise, CPE enjoys long-standing relationships with numerous organizational clients who return to the CPE program year after year to ensure that their employees keep their knowledge and skills sharp through continuing education and a commitment to lifelong learning.

Corporate & Professional Education (in millions)



CPE also measures its success through cohort completion rates and the degree through which corporate-based cohorts stay intact. CPE programs that are requested and offered year after year is another strong indicator of market demand, client satisfaction, and student success. For example, a major utility company in New England has now utilized CPE's Power Systems Management program for more than 10 years. Long-term educational relationships with corporate clients are the best indicators of course and programmatic success.

Every course in CPE has learning objectives and students are required to demonstrate competency before graduating and/or earning their certificates. Competency is measured through various pedagogical methods including, but not limited to, testing, written and oral reporting, mastery of knowledge, and cooperation, coordination, and leadership skills through team-based initiatives.

The CPE program assesses the quality of its curriculum through the WPI academic governance system. Every CPE course is vetted and approved by the Committee on Graduate Studies and Research comprised of WPI faculty, administrators, and graduate students. At the course level, each individual course and every faculty member is evaluated and assessed through student surveys, which are stored and available online and are accessible to all faculty members and students.

The quality of CPE students is another indicator of programmatic success, as CPE students must go through the same rigorous admissions process as WPI graduate students. It's important to note that CPE does not make the admissions decision for its students; rather it is done by the individual academic departments. Because the admission standards at WPI are quite high, CPE benefits by attracting a higher caliber of student by adhering to WPI's rigorous admission standards. Moreover, because CPE students are already experienced professionals, the quality of classroom and online discussions, as well as peer-to-peer interactions, are extremely high quality. In many ways, CPE students are the most knowledgeable and experienced students on campus. The pedagogical philosophy behind the CPE programs is quite similar to WPI's renowned educational approach. CPE programs can be project-based, and some are team-driven, but all offer CPE students the same proven pedagogical approach that has led to WPI's being one of the top-ranked engineering schools in the nation.

CPE Projections

Projections for the CPE program remain strong, and all leading indicators suggest continued growth ahead. WPI's CPE program distinguishes itself from many competitors by its customization, its on-site delivery, its high-quality instruction and online delivery, and the WPI brand name. CPE further distinguishes itself by being a professional development program and not merely job training. CPE's ideal market is currently employed professionals wishing to expand their knowledge and skills, which differentiates the CPE program from other types of continuing education and distance learning programs.

A solid portion of CPE's recent success can be attributed to its decision to move away from the satellite campus model that the program used up until 2005. Since eliminating satellite campuses, CPE has enjoyed consistent growth and stronger client relationships by bringing CPE classes right to corporate locations. This change from satellite campuses to on-site learning has strengthened the CPE program significantly, as it has lowered operating costs while strengthening client relationships through partnership and service. Moreover, it inherently positions the CPE program closer to its customers and the marketplace at large.

Another indication of future growth has been CPE's ongoing effort to monitor the corporate education marketplace closely for opportunity and growth. CPE continuously monitors the corporate educational marketplace looking for areas of need that are presently underserved. Presently, CPE is investigating programmatic opportunities in numerous new areas, such as cybersecurity, specific systems engineering techniques, and interdisciplinary courses, which is a growing need within the corporate workplace. Likewise, CPE anticipates continuing to strengthen its online delivery offerings as part of its ongoing efforts to strengthen blended learning overall. The CPE program brings a strong value proposition to its corporate partners and customers. CPE programs bring value-added, cross-functional interactions and knowledge to its corporate customers, benefitting them through more knowledgeable and skilled employees, through increased employee retention, by demonstrating a sense of commitment to employees, and by providing professional growth that will help attract and retain the very best talent.

Standard 4: The Academic Program										
(Summary - Enrollment and Degrees)										
Fall Enrollment* by location and modality, as of Census Date										
										AY 2009-2010
Degree Level/ Location & Modality	Main campus FTE	Other Campus FTE	Branches FTE	Other Locations FTE	Overseas locations FTE	On-Line FTE	Corres- pondence FTE	Total FTE	Unduplicated Headcount Total	Degrees Awarded, last year
Associates										
Bachelors	3,463			0		0		3,464	3,537	720
Masters	485			77		75		637	1,079	384
Clinical doctorates (e.g., Pharm.D., DPT, Au.D.)										
Professional doctorates (e.g., Ed.D., Psy.D., D.B.A.)										
M.D., J.D., DDS										
Ph.D.	177			0		0		177	212	34
Total Degree- Seeking	4,125		0	77	0	76		4,278	4,828	1,138
Non-matriculated students	78			96		18		191	416	n.a.
Visiting Students	24			0		0		24	53	n.a.
							Visiting=Exchange, Consortium			
							Non-matric+Visiting = "Non-Degree-Seeking Headcounts"			
Title IV-Eligible Certificates										Certificates awarded, last year
Students seeking certificates										0
* For programs not taught in the fall, report an analogous term's enrollment as of its Census Date.										

Standard 4: The Academic Program						
(Headcount by UNDERGRADUATE Major)						
		F'07	F'08	F'09	F'10	F'11
		3 Years	2 Years	1 Year	Current	Goal for next
		Prior	Prior	Prior	Year	Year
	For Fall Term, as of Census Date	(FY 2008)	(FY2009)	(FY 2010)	(FY 2011)	(FY 2012)
Baccalaureate						
	Actuarial Mathematics	44	49	70	67	70
	Aerospace Engineering	100	123	127	164	189
	Biochemistry	87	81	73	75	71
	Biology and Biotechnology	222	239	272	233	204
	Biomedical Engineering	183	185	235	306	387
	Chemical Engineering	182	214	244	254	281
	Chemistry	55	53	59	61	61
	Civil Engineering	224	222	245	232	240
	Computer Science	257	261	275	231	251
	Computers with Applications				1	2
	Economic Science	9	6	5	1	5
	Economics & Technology	2	1			
	Electrical & Computer Engineering	323	310	298	293	328
	Engineering Physics		1	3	5	5
	Environmental Engineering	17	28	34	55	75
	Environmental & Sustainability Studies	4	5	7	12	6
	Humanities and Arts	6	11	8	8	7
	Industrial Engineering	33	35	47	40	43
	Interactive Media & Game Development	134	128	127	148	151
	Interdisciplinary		2	2	2	2
	International Studies	4	2	1	1	3
	Liberal Arts & Engineering			2	1	2
	Management	26	41	44	28	31
	Management Engineering	44	54	70	80	75
	Management Information Systems	31	34	29	25	20
	Manufacturing Engineering (dropped in '08)	14	7	2	2	
	Mathematical Sciences	55	67	75	89	83
	Mechanical Engineering	594	558	586	575	590
	Physics	84	67	71	67	71
	Professional Writing	4	5	1	1	
	Psychological Science	6	2	7	7	10
	Robotics Engineering	20	103	154	208	242
	Society, Technology & Policy	5	6	6	3	
	System Dynamics	5	5	1		
	Undeclared	235	255	211	262	254
	Total	3,009	3,160	3,391	3,537	3,759

Standard 4: The Academic Program						
(Headcount by GRADUATE Major)						
		F'07	F'08	F'09	F'10	F'11
		3 Years	2 Years	1 Year	Current	Goal for next
		Prior	Prior	Prior	Year	Year
	For Fall Term, as of Census Date	(FY 2008)	(FY2009)	(FY 2 010)	(FY 2011)	(FY 2012)
Master's						
	Applied Mathematics	7	6	6	4	7
	Applied Statistics	7	8	3	11	11
	Biochemistry	2	3	1	1	1
	Biology & Biotechnology	14	10	9	7	7
	Biomedical Engineering	34	30	29	34	40
	Bioscience Administration			4	9	12
	Chemical Engineering	5	7	10	14	15
	Chemistry	3				
	Civil Engineering	26	31	35	43	43
	Clinical Engineering	1				
	Computer Science	69	54	63	68	70
	Construction Project Management	6	5	6	8	8
	Electrical & Computer Engineering	96	81	105	169	185
	Environmental Engineering	19	21	25	26	26
	Financial Mathematics	8	11	19	26	40
	Fire Protection Engineering	65	82	91	88	90
	Industrial Mathematics	2	2	1		
	Information Technology	27	44	49	41	41
	Interactive Media & Game Development					4
	Interdisciplinary	37	18	14	23	23
	Manufacturing Engineering	9	23	33	26	26
	Marketing & Tech Innovation	9	16	23	47	50
	Master of Business Admin	91	94	92	138	155
	Master of Mathematics for Educ	21	14	22	20	20
	Materials Process Eng	1	2	1	6	6
	Materials Science and Eng	11	25	30	31	45
	Materials Systems Engineering			1		
	Mathematical Sciences		2	1	1	1
	Mechanical Engineering	75	69	76	111	130
	Operations & Information Tech	2	2	1		
	Operations Design & Leadership	13	19	25	20	25
	Physics	5	3	4	4	4
	Power Systems Management		2	7	10	30
	Robotics Engineering			4	12	25
	System Dynamics	11	11	8	6	6
	Systems Engineering		5	49	75	75
	Total	676	700	847	1,079	1,221

"Goal" column is a rough estimate of incoming and returning students who are expected to enroll by 10/1/11.

Standard 4: The Academic Program						
(Credit Hours Generated By Department or Comparable Academic Unit)						
		3 Years	2 Years	1 Year	Current	Goal for next
		<u>Prior</u>	<u>Prior</u>	<u>Prior</u>	<u>Year</u>	<u>Year</u>
		Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011
Undergraduate						
	Aerospace Studies (AFROTC)	151	130	167	337	337
	Biology & Biotechnology	7111.5	7,438	8,312	7,897	8,292
	Biomedical Engineering	1696.5	1,979	2,175	2,456	2,600
	Civil & Environmental Engineering	4920.75	4,970	4,666	5,612	5,800
	Chemistry and Biochemistry	7805.25	8,573	8,524	8,427	8,848
	Chemical Engineering	2764.5	3,122	3,662	3,195	3,355
	Corporate and Professional Education	216	171	102	339	356
	Computer Science	8475.75	9,335	9,425	9,470	9,943
	Electrical & Computer Engineering	6561.75	6,867	6,812	7,645	8,027
	Fire Protection Engineering	58.5	160	109	113	118
	Humanities and Arts	17992.25	18,964	20,208	19,890	20,885
	Interdisciplinary Programs	2249.25	2,874	2,829	2,882	3,026
	Mathematical Sciences	17484	18,380	19,205	18,662	19,595
	Mechanical Engineering	14868	15,560	17,319	18,299	19,214
	School of Buisness	4417.5	5,298	5,453	4,556	4,784
	Military Science	157	158	100	184	193
	Non-Department	10.5	12	12	65	68
	Physical Education	2457	2,915	3,023	2,416	2,537
	Physics	6741.25	6,650	7,113	7,010	7,361
	Social Science & Policy Studies	5368.5	5,585	5,481	5,278	5,542
	Other				275	275
	Total	111,507	119,138	124,693	125,005	131,154
Graduate						
	Biology and Biotechnology	307.5	374	387	359	387
	Biomedical Engineering	638	423	523	717	860
	Civil & Environmental Engineering	864.5	1,006	1,040	1,104	1,325
	Chemistry and Biochemistry	379	329	481	360	432
	Chemical Engineering	297	289	310	427	512
	Corporate and Professional Education	531	846	1,712	1,885	2,262
	Computer Science	1924.5	1,851	1,627	1,654	1,985
	Electrical & Computer Engineering	2193.5	2,070	1,751	2,452	2,942
	Fire Protection Engineering	986	1,393	1,333	1,257	1,333
	Interdisciplinary Programs	10	22	8	14	14
	Mathematical Sciences	1440	1,252	1,243	1,411	1,411
	Mechanical Engineering	2040	2,296	2,811	3,067	3,680
	School of Buisness	2500	3,196	3,299	3,327	3,992
	Physics	356	290	325	317	317
	Social Science & Policy Studies	298	297	311	373	448
	Total	14,765	15,933	17,158	18,722	21,899

Standard Five: Faculty

The tenured and tenure-track faculty at WPI play the primary role in fulfilling the university's academic mission, and are committed to shaping WPI's educational programs and to delivering a significant majority of the academic credit offered to WPI students. Consistent with this principle, the university is committed to maintaining a tenured and tenure-track faculty of sufficient size to allow each tenured and tenure-track faculty member the time to carry out his or her responsibilities to both teach and engage in scholarship at the highest level.

—Faculty Constitution, new language approved by the Board of Trustees in May, 2011

Introduction

The focus on project-based learning defined in the WPI Plan requires a faculty with a special commitment to working closely with students. In the 2002 National Survey of Student Engagement, WPI had the highest ranking for student-faculty interaction among all participating schools in its Carnegie Class (Doctoral: Research-Intensive). In 2009 *BusinessWeek* ranked the School of Business No. 1 in the United States for student satisfaction and No. 2 for academic quality. In each of the past five years, WPI students' assessment of the *quality of instruction and interaction in major courses* has been ranked first against our select peer group on the EBI (Educational Benchmarking Inc.) survey of graduating seniors in engineering.

While WPI faculty have long been active in research, there has been growing emphasis on and support for faculty scholarship and research in the past 10 years. The Life Sciences and Bioengineering Institute at Gateway Park is the most visible sign of the institution's commitment to research. The increased importance has also been institutionalized by changes to the language of the Tenure and Promotion guidelines in the faculty constitution, approved in 2011, which specifies a continued ability of the probationary faculty member to produce high-quality scholarship. With the increased prominence of research, there has been a parallel and necessary increase in graduate education. This has been achieved through expanding some existing graduate programs and also by expanding the number of graduate degree programs (e.g., PhD in Biochemistry, PhD in Learning Sciences and Technologies).

Individual faculty have achieved national recognition for their teaching. Since 2003 four WPI faculty members have been honored as Professor of the Year for Massachusetts by the Council for the Advancement and Support of Education (CASE). One received the 2011 Distinguished Educator Award for Electrical and Computer Engineering from the American Society for Engineering Education (ASEE) and another was recognized as the Outstanding Teacher for the New England region by ASEE.

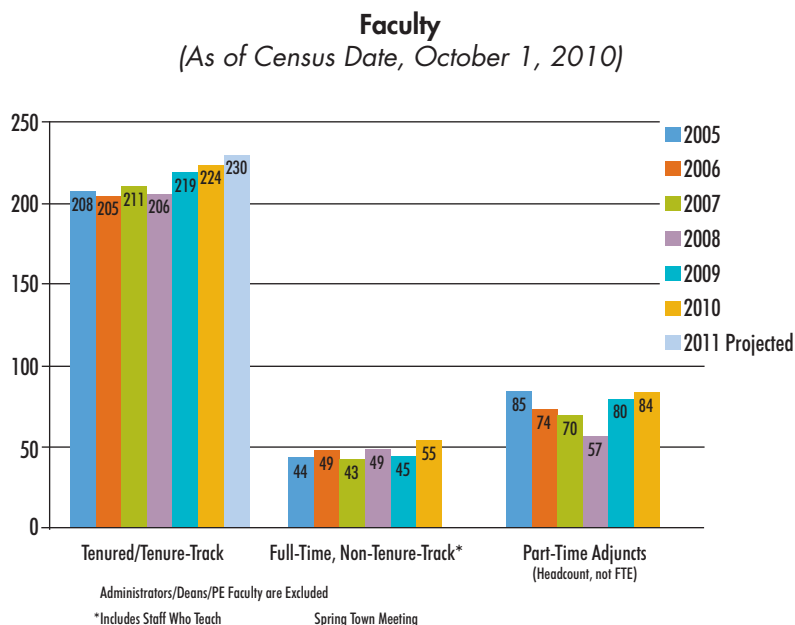
Faculty achievements in research have been similarly impressive. A senior professor in Mechanical Engineering was selected as a member of the National Academy of Engineering. One faculty member was elected a Fellow of the American Association for the Advancement of Science in 2010 for his research in biology. A professor in Mathematical Sciences was recently elected a fellow of the American Heart Association for his work on computational modeling of blood flow. We are particularly proud that these recognitions have not come at the expense of teaching; the biologist is one of our most active faculty advisors for the interdisciplinary projects and the engineer has been one of the lead faculty in developing the new Great Problems Seminars for first year students.

Description

In the fall of 2010 there were 224 full-time tenured and tenure-track faculty and 55 full-time non-tenure-track faculty with responsibilities in teaching and advising. There were also 39 part-time faculty equivalents. More than 98 percent of the tenured and tenure-track faculty held a doctorate and more than 91 percent of the full-time faculty members held a doctorate. Part-time faculty delivered about 16 percent of the academic credit. In total, non-tenure-track faculty delivered approximately 38 percent of the credit in the 2010-11 academic year.

For comparison, just before the last self-study in 2001 there were 218 tenured and tenure-track faculty but the total number dipped to a low of 205 in 2007. There were only 13 non-tenure-track faculty with full-time appointments in 2000 (compared with 55 today). There were 34 part-time faculty equivalents who were responsible for slightly more (17 percent) of undergraduate and graduate teaching at WPI in 2000. Ten years ago, part- and full-time non-tenure-track faculty accounted for a smaller fraction of undergraduate and graduate teaching (28 percent compared with 38 percent today).

Non-tenure-track faculty support the WPI mission; many are outstanding teachers and carry a proportionally heavier teaching load than their tenure-track counterparts and often contribute significantly in service and administrative roles. Part-time faculty play a significant supporting role and, even though they are part-time, many have long-term relationships with WPI. For example, some of the faculty identified as part-time are emeritus faculty who return to teach a few courses or advise projects at an off-campus project center. Some are “supporting” only, meaning they teach part-time as adjunct faculty. Others—though part-time—are “participating” faculty and deliver value beyond classroom teaching, including academic advising, serving on departmental committees, and advising student projects. The following chart shows how the distribution of faculty has changed in recent years.



The few faculty (full- and part-time) who do not have terminal degrees all have experience appropriate for their teaching responsibilities. Nine of the full-time non-tenure-track faculty hold the title Professors of Practice, with professional qualifications in addition to academic qualifications. For example, one Professor of Practice in the Interactive Media and Game Development program has 15 years of experience in the game

industry, with credits at companies including Lucasfilm Games. Another full-time, non-tenure-track faculty member (without a PhD), who directs the Actuarial Program in the Mathematical Sciences Department, is a Fellow of the Actuarial Society of America and a former vice president at John Hancock Insurance.

Faculty, tenure-track and non-tenure-track, also support special programs outside the traditional graduate and undergraduate classroom. Almost all courses offered by the Corporate and Professional Education Division are taught by full-time WPI faculty and those who are not full-time must be approved by the department head in the department awarding the credit for the course. A few programs offer courses through WPI's Advanced Distance Learning Network (ADLN), but, once again, these are courses developed and delivered by full-time WPI faculty. The School of Business has launched a major initiative to transform distance-only graduate business program to a "blended delivery" format—meaning part face-to-face classroom learning and part interactive web-based learning.

Recruiting New Faculty

Areas for faculty recruiting are an important part of the planning and evaluation cycle that builds the new budget each year. Once the decision to search is made, recruiting for tenure-track faculty begins with a faculty search committee in the relevant department. For each such search, the committee advertises nationally to establish a pool of candidates qualified by their teaching and scholarly credentials. At the start of each search, the Director or Associate Director of Human Resources meets with the search committee to review WPI's search procedures and discusses the institution's goal of increasing and supporting diversity in the faculty.¹ Typically, several candidates visit campus for at least one full day of scheduled meetings with faculty and staff, presenting a public lecture on their scholarly work and, in many departments, a separate presentation for students specifically to demonstrate their teaching philosophy and skills. The search committee, with the Department Head, and the associated Academic Dean, makes a recommendation to the Provost, who issues a letter inviting the chosen candidate to join the WPI faculty.

WPI has hired 71 new tenured and tenure-track faculty since fall 2007, including 19 in academic year 2009-10. This list includes the three founding Academic Deans (for Engineering, Arts and Sciences, and the School of Business), as well as new department heads in Biomedical Engineering, Chemistry and Biochemistry, and Humanities and Arts. To support strategic growth in research related to the life sciences, WPI took the approach of advertising "clusters" of positions in Biology, Biomedical Engineering, Chemistry and Biochemistry, as well as Physics and Mathematical Sciences.

The Department Heads have primary responsibility for assessing need and recruiting faculty for non-tenure-track positions. In some cases, the need is created by growth in teaching demand. In other cases, the need may be to support faculty research in a targeted area. In almost all cases, the positions are advertised nationally and the interview process is very similar to that of tenure-track faculty.

Most of the faculty with part-time appointments are educators with significant experience and, in many cases, a long-term relationship with WPI. For example, emeritus faculty return to WPI to teach courses and advise projects on a part-time basis. In other situations, the individual is someone with significant research or industrial experience who is interested in the challenge of teaching. The appointments meet short-term teaching needs created by changes in student enrollment, sabbaticals for tenured faculty, or to replace faculty who "buy out" courses for research programs.

1 A draft of *Faculty Search Guidelines* is currently under review and will be included in the Workroom.

The Provost's Office issues all letters of appointment for part-time faculty and ensures consistency with respect to scope of service, benefits, and titles. We are in the process of moving this responsibility to the offices of the Academic Deans.

Tenure and Academic Freedom

The tenure process is defined in the Faculty Constitution² and is the primary responsibility of the Committee on Tenure and Academic Freedom (CTAF). CTAF reviews all tenure applications, but is also responsible for ensuring the academic freedom of all faculty (tenure-track and non-tenure-track). CTAF participates in New Faculty Orientation each summer and the committee invites all probationary faculty to an open meeting each spring to review the tenure process.

The tenure process at WPI is unusually flat in the sense that one college-wide committee reviews candidates for tenure; there is no independent departmental decision and the faculty committee's recommendation goes directly to the Provost, who makes the final recommendation to the Board of Trustees. In 2009, WPI was recognized in a *Chronicle for Higher Education* survey for excellence in the area of Tenure Clarity and Process.

The Provost has the final responsibility for submitting the names of candidates deemed suitable for tenure to the President and the Board of Trustees for its vote at the February board meeting. In the event that the Provost's recommendation does not match that of the Tenure Committee, the Provost is required to meet with the Committee to discuss the reasons for his/her decision.

The roles of the new Academic Deans in the tenure process have been discussed by the faculty but have not yet been completely settled. In their first year, the Academic Deans have been heavily involved as advocates for new faculty searches, in the initial hiring decisions, and in the annual reviews for probationary faculty. In the tenure process, the Provost has consulted with the appropriate Dean before coming to a final decision.

Nominations for promotion (to the rank of full professor) normally originate in the home department of the faculty candidate, and are reviewed extensively by the Committee on Appointments and Promotions (COAP). Though the COAP promotion process in many ways parallels that of the Tenure Committee, there are some key differences. The candidate is represented not by a departmentally elected committee, but by a nominator and an advocate. These two individuals are invited to meet with COAP and answer questions, but do not participate in the vote. As with the promotion and tenure decision, both teaching and scholarship are the primarily components of the faculty portfolio that are evaluated.

Support for Scholarly Work

Professional development for new faculty members begins with New Faculty Orientation. The core of the weeklong program is now two half-day sessions introducing faculty roles, the philosophy of the WPI Plan, annual reviews and tenure and promotion criteria, and strategies for balancing teaching, scholarship, service, and family life. Extended orientation events are held throughout the year, focusing on topics as the grants application process.

WPI's New Faculty Mentoring Program is designed to foster career advancement and provide social support for new faculty, both tenure-track and non-tenure-track. The Director of the Morgan Teaching and Learning Center coordinates the mentoring program, and recruits mentors using the objectives and preferences identified by the mentee and after seeking input and preferences of the relevant department head. Participation is voluntary, but between 80 and 100 percent of new faculty have participated each year since 2007.

² Included in the Faculty Handbook, which is in the Workroom and on the web at www.wpi.edu/Images/CMS/FacultyGov/Faculty_Handbook_10-07-10.pdf.

A concern expressed in the 2001 self-study and the report of that visiting committee was the lack of critical infrastructure support for faculty engaged in research. One of the most significant investments has been the Life Sciences and Bioengineering Research Center (Gateway Park) providing state-of-the-art research facilities for faculty in the life sciences. WPI has also added staff and capability in the Office of Sponsored Projects and created an Institutional Review Board to help investigators understand and comply with the ethical guidelines and regulatory requirements for research involving human subjects.

Another issue discussed in the 2001 self-study was the lack of resources committed to start-up packages for new faculty. This not only made it difficult to compete for outstanding young faculty but seemed to send the message that research was not valued at the same level as teaching. In the past four years, very significant resources have been shifted to create competitive start-up packages for new faculty, including equipment, space, reduced teaching responsibilities, and support for graduate research assistants.

Support for Teaching

Teaching at WPI is defined to include classroom teaching, project advising, and academic advising. In evaluating faculty teaching in the annual review process and for promotion and tenure, significant weight is also given to innovations in courses and project advising. Once again, support for new faculty begins during new faculty orientation, with sessions on project advising and course planning for seven-week terms.

The typical course schedule for a tenure-track faculty member includes three or four courses in each academic year, but the faculty are also expected to advise student projects (Interactive Qualifying Projects and Major Qualifying Projects). To capture both classes and project advising in the Data First form (at the end of this section), we have reported the data for total number of credits delivered, not the number of courses taught. For example, in the last academic year, the median number of credits delivered by an Assistant Professor was 102 and the maximum for the same group was 570. A faculty member who teaches four 3-credit classes with 25 students in each class would deliver 300 credits in an academic year. If the faculty member also advised 12 students in IQPs and/or MQPs (each a 9-credit activity), then the number of credits would total 408.

For full-time non-tenure-track faculty, the number of courses taught usually includes six to eight courses in a year (up to two courses in each term) along with project advising and administrative duties.

Professional development specific to WPI's teaching mission has been coordinated in large part by the Morgan Teaching and Learning Center. In 2010, more than half of all faculty members made some use of the programs and services of the Morgan Center.³ The Food for Thought teaching and learning seminar and workshop series is the most highly used program.

The Morgan Center and the Educational Development Council (EDC) annually solicit and award Educational Development mini-grants to support innovation in teaching practice. Course Design Technology Grants are also available for faculty who wish to transform their course designs through the innovative use of instructional technology. In addition, the EDC awards Teaching Development Travel Grants to faculty applicants who wish to participate in a national conference or workshop for professional development purposes.

Graduate teaching assistants often provide support for faculty teaching large or multi-section courses. Responsibilities include laboratory and conference sections, leading help sessions, and grading student work. Except in rare and exceptional circumstances (for example, summer courses taught by graduate students who

³ The annual reports for the center are included in the Workroom.

are working on their dissertations), graduate students do not have primary responsibility for teaching courses at WPI.

Participation in a campus-wide TA Training Seminar is required for all first-time TAs, including sessions on ethical and legal responsibilities, grading student work, preparing and delivering lessons, and cultural differences in teaching and learning. Completion of WPI's online Harassment Prevention training course is also required. All graduate students with teaching interests may also enroll in courses within the Certificate in College Teaching Program of the Colleges of Worcester Consortium. All international TAs take the SPEAK test for English fluency and those needing improvement enroll in an ESL course and/or the Conversation Partners program. Several departments have formal evaluation processes for TA performance and others use an informal system of communication to identify and address any problems in TA performance.

In many departments, undergraduate students are hired in instructional support capacities with titles such as Peer Learning Assistant, Senior Tutor, and Senior Assistant. Roles include laboratory support, grading, help sessions, and office hours, and sometimes conference sections. In some departments, the Peer Learning Assistants are specifically trained to support cooperative learning and students working on small-group projects.

The Office of Academic Advising provides a range of support services for faculty teaching undergraduate students. For example, the Math and Science Help program (M*A*S*H) provides small-group help sessions for all of the introductory courses in Math, Physics, and Chemistry. Individual tutoring (at no cost to the students) is available (and very well used) for a range of courses from calculus through advanced engineering courses. The Writing Center is also housed in the office's Academic Resource Center, providing both informal, one-on-one tutoring as well as targeted support for courses and project teams.

The university recently added a full-time Director of Disability Services to support students with disabilities. Those who require academic accommodations (such as extra time on tests) are supported by the Advising Office; the office works with the faculty to provide all the required support.

Because academic advising is also defined as part of the faculty's teaching responsibilities, the Office of Academic Advising plays another supporting role for faculty. The office provides regular advising workshops and maintains an advising handbook.⁴ When faculty members identify a student in trouble or in need of special help, the Office of Academic Advising is their first resource.

Appraisal

Development of the WPI curriculum is guided by several different levels of Learning Outcomes, from outcomes defined by departments for specific courses to the Undergraduate Learning Outcomes that are the goal for all graduates. These outcomes and the assessment plan are discussed in the chapter on Standard Four, but individual faculty receive more targeted assessment and support for classroom teaching, project advising, and academic advising.

By vote of the WPI faculty, students in all undergraduate and graduate courses (including online courses and courses offered by the Corporate and Professional Education division) are asked to evaluate those courses and their instructors using a standard form distributed at the end of each term. The current form was developed internally and adopted by the WPI faculty in 2005. The Office of the Dean of Undergraduate Studies provides oversight for form distribution, data collection, and dissemination of results. The forms are typically

⁴ www.wpi.edu/Admin/OAA/Handbook/.

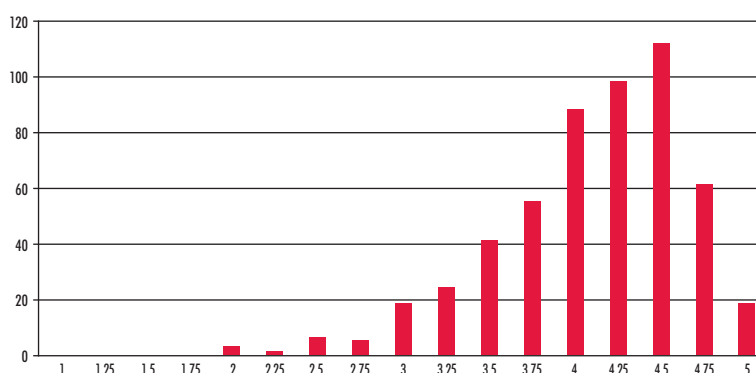
distributed to students in the last week of the course and the results are collected, scanned, and returned to the faculty before the start of the next term. Faculty members receive the paper forms after processing, including student comments. The aggregated results for quantitative questions are compiled for every faculty member and are viewable by all campus constituencies, including students, on the web information system.

The Provost's Office and Deans, department heads, and the tenure and promotion committees regularly consider these data in making decisions about merit pay increases, promotion, and tenure. The policy adopted by the faculty specifies three questions for use in administrative review. For example, the second question on the form asks the students to provide an overall rating of the instructor:

Q2: My overall rating of the instructor's teaching is.... (1=Very Poor, 5 = Excellent)

The graph below gives the distribution of instructors' course average for all academic courses (grad and undergrad) taught in the spring terms of 2011. The graph is "typical," showing that the majority of courses have an average rating above 4.00 on the 5-point scale (the average in spring 2011 was 4.08). Note also that there were 191 courses (including almost 3,600 students) with an average rating of at least 4.50 on the 5-point scale.

Q2 Distribution for All Courses (530) in Spring 2011



There were also 41 courses with an average rating below 3.25. For these instructors, the Dean of Undergraduate Studies contacts the relevant department head, who is the person in the best position to interpret the data in the context of the particular course and student population. Department Heads are then asked to follow through with these instructors and reports back to the Dean of Undergraduate Studies.

The Morgan Teaching and Learning Center offers tips on interpreting student course report data and using them for teaching improvement. One-on-one consultations are available to instructors who wish to discuss their student ratings and make modifications in their course design or teaching practice.

The Faculty voted to adopt a Student Report on IQP Learning and Advising in 2007-08. This form is integrated into the online eProjects system so that all undergraduates are prompted to complete the questionnaire when they submit their project report. Questions address both advisor performance and students' perception of progress toward the IQP learning outcomes. The aggregated quantitative results are viewable by all campus constituencies, including students, on the eProjects website. Only the advisor is able to view students' narrative responses to open-ended questions. The IQP student report data are monitored by the Dean of the Interdisciplinary and Global Studies Division, which provides oversight for the IQP.

A similar Student Report on MQP Learning and Advising has been developed and tested by the Committee on Academic Policy and will be brought to the Faculty for a vote in academic year 2011-12.

Although course-based assessment of student learning outcomes is addressed in course design workshops and, particular, seminars offered by the Morgan Teaching and Learning Center, little institutional support is offered for program-level assessment of what and how students are learning to help departments use student learning outcomes. Based on suggestions from department and program heads, the Director of the Morgan Center will be piloting an Outcomes Assessment Interest Group in academic year 2011-12.

Ethics and integrity are key learning outcomes for WPI students. At the start of each academic year, the Dean of Students Office disseminates to all faculty academic honesty statistics for the previous five years, disaggregated by department. The *Faculty Guide to Academic Integrity* at WPI is distributed at the same time, for the purposes of educating faculty about policies and practices, providing suggestions for minimizing academic dishonesty, and with the intent of increasing the compliance rate with WPI's procedures.

Appraisal

One of the Presidential Commissions in 2005 recognized the need to provide equity increases to our full professors. There has been an equity pool specifically set aside for the past four years to bring our salaries for full professors closer to benchmark. Since fall 2007, the mean salary for full professors has risen 18 percent, more than double the rate of increase for either associate or assistant professors, and finally achieving parity with full professors at our peer schools.

Over the past five years there has also been a concerted effort to substantially increase the compensation for our non-tenure-track faculty. In 2007 the minimum salary for a full-time non-tenure-track faculty was \$24,000. By fall 2010 the minimum had risen 33 percent to \$32,000 and the mean had also risen 25 percent to \$58,002. This impressive increase reflects recognition of the importance of these members of our community and the need to compensate them adequately for the work they perform. We have an exceptional population of non-tenure-track faculty, as is evidenced by their teaching awards. Since non-tenure-track faculty became eligible to receive the Trustees' Award for Outstanding Teaching in 2007, two of the five awards have gone to non-tenure-track faculty.

Diversity of the Faculty

This is a national challenge in higher education, but an especially difficult challenge in fields such as science and engineering. Prior to authorizing ads for faculty openings, departments must demonstrate to the Provost's office the steps they are taking to ensure that the ad is disseminated to the widely and specifically targeted to minority populations of appropriately credentialed individuals (e.g., chemistry positions advertised with the National Organization for the Professional Advancement of Black Chemists & Chemical Engineers and the Society for Advancement of Chicanos and Native Americans in Science).

WPI is committed to being a "family-friendly" university. More than 10 years ago, the faculty voted to accept a significant revision to tenure procedures to give faculty the option to "stop the tenure clock... for reasons including, but not limited to, child bearing, child rearing, extenuating circumstances related to personal or family members' health... or for other reasons that may be provided for in the Family and Medical Leave Act of 1993."

In 2007 the President reaffirmed the institution's commitment to diversity as one of the key measures of a high-quality campus life. While the previous strategic plan took a quantitative approach to goals for diversity, the new plan focuses more on pluralism and the respect for differences in all aspects of campus life, including within academic programs. It is important that *all* qualified individuals find a welcoming and supportive environment at WPI.

We will make WPI a leader in career opportunities for women through such efforts as targeted marketing and outreach programs to women faculty and students, a review of the tenure and promotion processes to ensure equitable treatment, and a formal mentoring program for young women scholars.⁵

The President's Council for the Support of Women and Minorities at WPI⁶ was created in 2005 to "promote and oversee the successful recruitment, retention, support, development, and advancement of women and members of underrepresented minorities in the WPI faculty, staff, and student body." In a 2010 study, Forbes.com rated WPI 11th in the nation in its new "Best Colleges for Women and Minorities in STEM" survey. The School of Business has been ranked "Top 10" in the U.S. for Greatest Opportunities for Women⁷ for four of the past five years – reflecting the relatively high percentage of our faculty who are women.

Projection

Support for diversity in the faculty remains a priority

This is discussed with every department search committee and is one of the main items of discussion when the Provost presents his report to the Board of Trustees each year. The Provost's Office has just completed a new draft of the *Faculty Search Guide*, designed to keep this strategic priority prominent in all faculty searches.

While WPI has seen significant increases in diversity of the student body, and academic and student affairs professionals have noted that the institution has reached a "critical mass" that is making it easier to recruit and retain both female students and students from under-represented groups, the challenges remain significant at the faculty level. As noted above, prior to authorizing ads for faculty openings, departments must demonstrate to the Provost's Office the steps they are taking to ensure that the ad is disseminated to the widely and specifically targeted to minority populations of appropriately credentialed individuals.

Evaluation and Professional Development for Non-Tenure-Track Faculty

The role of non-tenure-track faculty has been one of the most important items for discussion in Faculty Governance for much of the last decade. Two key motions were discussed and passed in the April, 2011 faculty meeting:

Motion #1: Defining the roles of tenure-track and non-tenure-track faculty at WPI;

Motion #2: Eliminating limits to time-in-service for non-tenure-track faculty.

The Secretary of the Faculty, in presenting the motions to the Academic Policy Committee of the Board of Trustees, described the first motion as the key that "unlocks the discussion." The next step, which is in the form of a draft motion prepared by Department Heads and developed further in the faculty Committee on Governance, defines titles, evaluation procedures, and professional development for non-tenure-track faculty.

5 From the President's Strategic Plan: www.wpi.edu/offices/president/strategicplan.html.

6 President's Council: www.wpi.edu/offices/president/support-women.html.

7 Princeton Review www.wpi.edu/news/20101/bsschoolhtml.htm.

Support for Graduate Students

WPI's support for graduate students has been well below that provided by competing institutions and this has made it difficult to attract graduate students. The Dean of Graduate Studies made a major change to the way WPI assistantships are allocated to departments, allowing the departments the flexibility to shift support from students in limited (grading only) roles to provide more long-term support for students supporting faculty research programs.

Some department heads are concerned that financial support for graduate students (Teaching Assistantships) are allocated based purely on historical assignments and not adjusted to meet current and future needs in teaching and research. As student enrollments have grown, most departments and programs have begun making use of a variety of instructional assistants (undergraduates and unfunded graduate students) in addition to graduate Teaching Assistants, particularly in the role of graders.

Reviewing the 2001 Projections

One of the great values of this self-study has been the opportunity for a review of how WPI has changed over the past 10 years, and there have been many dramatic, positive changes. It is also valuable to consider items where work remains:

- WPI discussed the need to develop a new faculty workload model in the 2001 Self-Study, giving appropriate value to student and project advising, to research, and to other activities that are important in carrying out its mission.
- A process adopted by the faculty in 1987 for periodic review of teaching by tenured faculty is not being carried out consistently among departments.
- In 2000-01, faculty governance began a review of the roles, responsibilities, and accountability of part-time faculty (including those with both staff and teaching activities) and of full-time, non–tenure-track faculty.
- There is a shortage of faculty office space and undergraduate and graduate laboratory space on campus. The university is considering the construction of a new academic building to alleviate this problem.

Standard 5: Faculty											
(Rank, Gender, and Salary, Fall Term)											
		3 Years		2 Years		1 Year		Current Year		Next Year	
		Prior		Prior		Prior		Current Year		Year	
		(FY2008)		(FY2009)		(FY2010)		(FY2011)		(FY2012)	
		FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
Number of Faculty											
Professor	Male	80		75		79		80		80	1
	Female	6		6		8		9		9	
Associate	Male	56		59		60		58		59	
	Female	21		22		23		23		23	
Assistant	Male	32		27		34		38		38	
	Female	16		16		15		16		20	
Instructor	Male	15		17		32		37		42	
	Female	6		6		13		18		18	
Other	Male		55		40		74		85		98
	Female		15		17		28		32		38
Total	Male	183	55	178	40	205	74	213	85	219	99
	Female	49	15	50	17	59	28	66	32	70	38
Total Faculty											
Professor		86	-	81	-	87	-	89	-	89	1
Associate		77	-	81	-	83	-	81	-	82	-
Assistant		48	-	43	-	49	-	54	-	58	-
Instructor		21	-	23	-	45	-	55	-	60	-
Other		-	70	-	57	-	102	-	117	-	136
Total		232	70	228	57	264	102	279	117	289	137
Salary for Academic Year											
Professor	Minimum	75,000		80,750		84,250		88,435		90,204	69,708
	Mean	110,521		117,400		122,612		130,301		126,568	69,708
Associate	Minimum	60,000		64,170		62,000		60,316		61,522	
	Mean	88,721		93,700		92,490		96,002		96,200	
Assistant	Minimum	47,350		50,000		55,000		57,000		58,140	
	Mean	75,832		77,900		77,704		82,399		85,660	
Instructor	Minimum	24,000		31,426		32,000		32,000		30,900	
	Mean	46,270		58,407		57,327		58,022		61,891	
Other	Minimum		2,000		2,250		4,000		3,200		2,500
	Mean		9,581		7,000		15,081		17,457		13,000

Standard 5: Faculty

(Highest Degrees and Teaching Assignments, Fall Term)

		3 Years		2Years		1 Year				Next	
		Prior		Prior		Prior		Current Year		Year	
		(FY2008)		(FY2009)		(FY2010)		(FY2011)		(FY2012)	
		FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
Highest Degree Earned: Doctorate											
Professor		85		80		86		88		88	1
Associate		76		80		82		80		80	
Assistant		46		41		47		52		57	
Instructor		16		18		29		35		34	
Other			45		34		49		52		65
Total		223	45	219	34	244	49	255	52	259	66
Highest Degree Earned: Master's											
Professor		1		1		1		1		1	
Associate		1		1		1		1		2	
Assistant		2		2		2		2		1	
Instructor		5		5		14		16		18	
Other			24		23		41		51		54
Total		9	24	9	23	18	41	20	51	22	54
Highest Degree Earned: Bachelor's											
Professor											
Associate											
Assistant											
Instructor						2		4		8	
Other			1				11		13		16
Total		-	1	-	-	2	11	4	13	8	16
Highest Degree Earned: Professional License											
Professor											
Associate											
Assistant											
Instructor											
Other							1		1		
Total		-	-	-	-	-	1	-	1	-	-
Fall Teaching Load, in credit hours											
Professor	Maximum	900		762		825		789		952	117
	Median	138		138		153		123		214	117
Associate	Maximum	567		717		683		816		889	
	Median	150		133		129		137		185	
Assistant	Maximum	571		615		681		570		737	
	Median	90		120		125		102		170	
Instructor	Maximum	868		1,128		1,170		876		1,032	
	Median	273		213		204		237		260	
Other	Maximum		910		624		702		708		761
	Median		135		69		61		69		69
		Explanation of teaching load: The standard teaching load for a tenure-track faculty is four 3-credit courses per year plus a variable number of credits for project advising (IQP, MQP, and Graduate). The numbers reported here are the actual numbers of credits delivered, so they include both classroom teaching and project advising.									

Standard 5: Faculty											
(Appointments, Tenure, Departures, and Retirements, Full Academic Year)											
		3 Years		2 Years		1 Year				Next	
		Prior		Prior		Prior		Current Year		Year	
		(FY2008)		(FY2009)		(FY2010)		(FY2011)		(FY2012)	
		FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
# of Faculty Appointed											
Professor		1				4		3		2	
Associate		3		3		2					
Assistant		13		3		13		13		9	
Instructor				1							
Other			**		**		**		**		
Total		17	-	7	-	19	-	16	-	11	-
# of Faculty in Tenured Positions											
Professor		85		83		85		87		88	1
Associate		73		72		77		76		78	
Assistant		1		1		1		1		1	
Instructor											
Other											
Total		159	-	156	-	163	-	164	-	167	1
# of Faculty Departing											
Professor		1				1		4		1	
Associate								1			
Assistant		2		2				2			
Instructor		5		5							
Other			**		**		**		**		**
Total		8	-	7	-	1	-	7	-	1	-
# of Faculty Retiring											
Professor		3		2				3			
Associate		1		1				1			
Assistant											
Instructor											
Other											
Total		4	-	3	-	-	-	4	-	-	-
**PT faculty are appointed for one year terms. But many PT faculty are reappointed each year. For example 64% of the PT faculty in Fall 2010 also had a PT appointment in Fall 2009.											

Standard 5: Faculty											
(Number of Faculty by Department or Comparable Unit, Fall Term)											
		3 Years		2 Years		1 Year				Next	
		<u>Prior</u>		<u>Prior</u>		<u>Prior</u>		<u>Current Year</u>		<u>Year</u>	
		(FY2007)		(FY2008)		(FY2009)		(FY2011)		(FY2012)	
		FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
Number of Faculty by Department (or comparable academic unit)											
	AS						3		3		3
	BB	12	1	13		16	1	15	2	15	1
	BE	7		6	1	6	2	9	4	9	4
	CE	13	4	13	2	13	7	15	4	15	3
	CH	9	4	9	2	10	7	10	4	12	5
	CM	10	1	9	1	10	2	10	2	10	5
	CPE		3				2	1	1		
	CS	21	7	21	9	26	4	28	6	32	6
	EE	21	8	21	6	21	4	21	5	20	11
	FP	4	6	5	2	5	2	6	1	6	1
	HU	31	11	28	13	39	13	42	18	42	25
	ID	2	1	2		6	5	5	4	6	5
	MA	31	5	28	7	33	5	34	6	35	9
	ME	28	4	30	1	33	7	34	8	35	10
	MG	20	8	20	8	20	8	21	10	23	13
	MS						4		6		5
	PE	1		1		1	15	1	17	1	18
	PH	14	1	13	1	15	2	15	1	17	2
	SS	8	6	9	4	10	9	12	9	12	6
	Other								6		4
	Total	232	70	228	57	264	102	279	117	290	136

Standard Six: Students

Introduction

WPI seeks to enroll students with talent and interest in science, engineering, management, and the humanities who are also passionate about how science and technology can support solutions to the most important problems facing our global society.

The Division of Enrollment Management works to encourage and identify applicants who can be successful, who will benefit the most and contribute the most, in our undergraduate project-based educational programs and our part- and full-time graduate programs. The division is also responsible for implementing the academic policies defined by the faculty and working with the faculty and the Office of Academic Advising to monitor student academic progress.

The Division of Student Affairs works to build a supportive community that maximizes each individual's growth in both personal and professional dimensions. There are many programs designed to help students build a strong support network that includes peers, professional staff, and faculty. Student Affairs professionals not only support, they teach both students and faculty about student development and strategies for personal growth.

Admissions: Description and Appraisal

The WPI Plan is the heart of the university's marketing and recruiting message and it is a great differentiator. Student project work is the centerpiece of print, online, and in-person presentations about the undergraduate program. Collaboration and teamwork, global project experience, the intensity of a seven-week course schedule, and the unusual grading system all attract interest and questions in open-house presentations for prospective students.

The most recent strategic plan¹ set a goal of increasing the undergraduate population to between 3,200 and 3,400 by 2015. The target was reached several years ahead of schedule when WPI welcomed its largest first-year class ever with just over 900 students in August 2008. The data-first forms (included with this standard) show this number every year, but 2008 was the first time we enrolled more than 900 freshmen—a class of closer to 700 had been the norm for the decade before.

The first-year class has grown but the number of applications has grown faster (from about 3,100 in 2001 to more than 7,000 for the class entering in August 2011) with an associated improvement in quality metrics for the admitted students. There are certainly many factors driving this growth—including the national economy and WPI graduates' strong showing for starting salaries and career placement²—but we are confident that the key driver is the quality of the undergraduate programs and the timeliness of the WPI Plan.

The undergraduate Admissions Office directs a creative, comprehensive campaign of direct mail, electronic mail, staff travel, on-campus programming, alumni activity, and social media programming toward students who have expressed an interest in WPI. While the Admissions Office leads the effort to recruit students, faculty and professional staff from the entire WPI community are involved at all levels.

The university now offers two application options for first-year students: Early Action and Regular Decision. Early Action offers students a “non-binding” alternative to traditional Early Decision programs and was

1 New Vision, New Ideas, New Resources II, www.wpi.edu/offices/president/strategic-plan.html.

2 WPI appeared in the Forbes.com “top ten list” for graduate salaries; see www.wpi.edu/news/20089/forbesnews.html. as well as the Career Development Center report in the Workroom.

offered for the first time to students entering in the fall of 2002. About 14 percent of applicants used it in the first year, about 30 percent of students in 2006, and more than 50 percent of applicants for the class entering in 2011 applied Early Action.

Professional members of the admissions staff review applications each winter, starting with Round 1 of the Early Action students in November and continuing with a second Early Action deadline of January 1. The Regular Decision deadline is February 1. During the selection process, the Admissions Office pays close attention to the student's record of course selection, trends in grades, overall grade point average, rank in class, courses taken and grades earned in the senior year of high school, recommendations from counselors and high school faculty, and a required personal statement by the applicant.

Students are required to have four years of mathematics courses (including pre-calculus) and four years of English. Two laboratory science courses are required, usually physics and chemistry. Note that WPI does not offer any "remedial courses" in science or mathematics and only one (non-credit) course in English as a second language, which enrolls between 30 and 40 international students each year.

One significant change was made to the WPI application process in 2008 when WPI introduced an SAT-optional application path. WPI was the first technological university in the nation to go test optional. Students who choose this option (referred to as Flex Path) may submit alternative materials that they believe better reflect their potential for academic success at WPI than standardized test scores. Students are encouraged to submit examples of academic work or extracurricular projects that reflect a high level of organization, motivation, creativity, and problem-solving ability.

The majority of students still submit the Scholastic Aptitude Test (SAT) I or the American College Test (ACT). The Admissions Office focuses its review on the best verbal and math scores for a student who submits the SAT and the composite score for those submitting an ACT score. The 2011 admissions cycle saw 5 percent of the entering Class of 2015 submit flex path materials in lieu of test scores. Some examples include FIRST Robotics design projects, Eagle Scout projects, research papers, student-designed websites and on-line games, and art and design portfolios.

Two points to note: Flex Path was designed, in part, to support WPI's efforts to attract a broader range of students to science, technology, engineering, and math disciplines—particularly women and underrepresented minorities. To date, the number of students using the SAT-optional route for application is small (fewer than 1,000). This is a five-year pilot study and WPI is continuing to assess the success rates of students who choose the SAT-optional application path. One admissions staff member is the coordinator of multicultural recruitment. His efforts are focused on recruiting activities and on areas from which we intend to draw African American and Hispanic students. This position works closely with the Office of Diversity and Women's Programs.

Requests for transfer credit are processed by the Admissions Office, but the final decisions regarding transfer credit are made by the faculty in the appropriate academic department. Generally, college-level courses in chemistry, calculus, and calculus-based physics and engineering science, humanities and arts, and the social sciences will transfer. Examples of courses that will not transfer are pre-calculus or non-calculus-based physics or engineering science.

WPI has articulation agreements with three community colleges in Massachusetts. These programs require a partnership in which the two schools identify a clear academic plan of study at the community college leading to success at WPI. The numbers of students are small, but we remain committed to maintaining these opportunities for "non-traditional" students.

Over 50 percent of incoming students bring Advanced Placement credit. Advanced Placement credit is awarded to undergraduate students who score 4 or 5 on an AP exam³ and for students with appropriate scores on other internationally recognized tests for college credit.⁴ Students who complete courses through *Project Lead the Way* (PLTW),⁵ a nationally recognized pre-engineering program, may receive elective credit in the appropriate engineering department. The policies are clearly stated in the Undergraduate Catalog and available on the Web.⁶

WPI has also designed and administered its own placement tests to help first-year students choose their first semester courses. For example, the Mathematical Sciences Department designed an online calculus placement test that students complete while designing their schedules. It gives them immediate feedback and provides reliable information to the math department for evaluating student preparation and developing targeted tutorial programs for foundational math courses.

Students are admitted to WPI, not to any particular program or major. While students may specify a major when they apply, this information is not used in the review of applications. Our belief, and experience, is that the majority of students who declare a certain major in their application change that major at least once. In fact, the single largest group of majors in the entering class has been “undecided” for many years. WPI makes it very easy for a student to change his or her major and much of initial academic advising is guided by the belief that students should be able to change their minds. In addition, the Career Development Center offers a 4-credit major selection program for first-year students.

In a real sense, the work of the Admissions Office starts many years before the junior and senior years of high school. WPI has been committed to pipeline programs⁷ promoting interest in science and engineering for almost 30 years. While these programs certainly benefit WPI, they make a contribution to the population of women and underrepresented students who are interested in studying in the sciences and engineering. More graduates of our pipeline programs go on to study at other colleges and universities than eventually matriculate at WPI.

Frontiers, now in its 28th year, is a residential research and learning experience for high school students with a focus on current laboratory techniques and unsolved problems in science and engineering. *Camp Reach* is an award-winning summer residential program for Massachusetts girls entering 7th grade. In many ways, it is designed to mirror the WPI Interactive Qualifying Project experience by including a design project for a community organization. Nearly 1,500 middle- and high school students participated in WPI programs in the summer of 2011.

WPI also supports STEM teacher preparation with summer programs providing professional development for middle- and high school teachers in math, science, and engineering. For example, WPI is the home for the Massachusetts Academy of Mathematics and Science,⁸ an experimental high school for the state of Massachusetts. Mass Academy has provided professional development to between 500 and 600 New England teachers each of the last two summers. WPI recently established a STEM Education Center to improve the preparedness of primary and secondary teachers through certificate and degree programs, professional development workshops, and integration of research and teaching on learning.

3 Undergraduate catalog and www.wpi.edu/admissions/undergraduate/apply/placement.html.

4 International students information at www.wpi.edu/admissions/undergraduate/apply/advanced-standing.html.

5 www.pltw.org.

6 Undergraduate catalog and www.wpi.edu/admissions/undergraduate/apply/requirements.html.

7 A complete list of current programs is available at www.wpi.edu/academics/Summer.

8 www.massacademy.org.

Graduate Admissions

The Office of Graduate Admission works to market WPI's graduate and research programs and supports the application process for the programs, but the decisions to admit a student reside within the academic department or program.

WPI's graduate programs have been growing more rapidly than the undergraduate programs. For example, the number of applicants and the number of students enrolled in master's degree programs doubled between 2008 and 2011. The number of students in the PhD programs has increased, but not at the same rate. The Dean of Graduate Studies has been working with the Administration and the Academic Department Heads over the past year to restructure the way that institution funds are used to support graduate students. The first goal has been to make the graduate student stipend competitive with that of our peer institutions. A second goal has been to shift more funding to provide support for students in the PhD programs.

Financial Aid

As national college tuition and fee levels continue to increase, college student debt levels are also on the rise. WPI is cognizant of its rising student debt levels and continues to increase the amount of institutional scholarship/grant dollars it offers to students each academic year. In addition to these efforts, WPI follows federal recommendations in encouraging students and parents to borrow through the federal loan programs first before looking into more costly and less secure private loan options. WPI is also in the beginning stages of creating a financial literacy program through its Office of Financial Aid as a means to assist its students in becoming wiser financial consumers.

Retention and Graduation

WPI has achieved a first-to-second year retention rate of about 95 percent in the past two years and has a steady (6-year) graduation rate of about 80 percent. The four-year graduation rate remains at approximately 70 percent. Faculty and professional staff continue to work on programs to improve each of these statistics.

Work to improve retention and graduation rates begins when students arrive for New Student Orientation (NSO). This four-day, intense welcome introduces students to WPI and all the resources available to support their academic success, and also helps them make social connections that will support them through all four years. The schedule for NSO is designed by Student Affairs and Academic Affairs and is reviewed and updated every year.

One of the first meetings during NSO introduces the students to the Insight Advising Team, including the Resident Advisor (for each residence hall floor), the Faculty Advisor (assigned by residence hall floor), and the Community Advisor (an undergraduate student). The Insight Program could be viewed as an "extended orientation" that moves discussion of key academic and social issues out of the too-packed orientation schedule into a time when the students are ready to hear important messages. For example, a session on managing test anxiety is usually held about the time of the first exam in the introductory physics course.

One of the unplanned advantages of the seven-week term system is an early warning system; students receive their first grade report in October and, even though WPI does not formally evaluate academic standing until the end of the fall terms, the Office of Academic Advising reviews all grade records and contacts the student, their parents, and their academic advisor, if there are signs of concern.

The Associate Dean for the First Year introduced an October Re-Orientation Session in 2010 to bring the full first-year class back together to talk about the experience of the first term with their advisors. In one particularly interesting session, a quick (blind) survey showed students that almost two thirds of them had just received "the lowest grade that they had ever seen" (perhaps a B). One of the challenges that WPI faces

in the first year is helping students who have always been very high performers (sometimes without having to struggle) handle their first B or C. The re-orientation session shows them that they are not alone and makes it easier to ask for help.

Academic progress is evaluated by the Registrar and grades are sent home to parents⁹ twice each year. Guidelines for the determination of satisfactory academic progress (as well as academic warning, probation, suspension, and readmission) are detailed in the Undergraduate Catalog. Because WPI does not compute a standard Grade Point Average, successful course completion is used as the measure of academic progress: to remain in good standing, a student must complete four of six courses in the fall and spring terms—eight courses in an academic year. Students who do not make satisfactory progress are notified in a letter (paper and electronic) from the Dean of Undergraduate Studies and the Registrar in January and May. Students are asked to make an appointment with the Office of Academic Advising and their academic advisor to discuss the issues. Summary statistics on student success are reported twice each year to the Undergraduate Outcomes Assessment Committee, the Department Heads, and the Academic Planning Committee of the Board of Trustees.

The Office of Academic Advising introduced special programs to help students return to good standing and graduate on time. These include a Summer Bridge Program, Study Skills and Time-management Workshops, Individual Academic Coaching by professional staff, and Peer Academic Coaching with undergraduate students trained by the Office of Academic Advising.

When students experience difficulty in any part of their experience at WPI or personal life, it can impact their academic success, and ultimately their persistence at the university. The WPI Care Team was established in 2006 to receive, consider, and act upon information or behavior(s) of concern exhibited by a student or group of students. The Dean of Students Office coordinates the group of professional staff from across the university that meet weekly to address the safety, welfare, and academic success of students. The Care Team serves as a behavioral intervention team that designs a proactive plan of action that is in the best interest of the student and the campus community.

Campus Life: Description and Appraisal

The professional staff members in Student Affairs strive to educate the whole person by offering programs and activities designed to influence *attitudes*, change *behaviors*, develop *skills*, and expand students' *knowledge* in the areas of global citizenship, professionalism, and leadership. The emphasis is on partnership with students and parents as well as all faculty and staff in the WPI community.

Over the last decade, WPI has increased staffing in many of the departments across the division, including Residential Services, International House, Counseling Center, Career Services, and Health Services. There have also been strategic realignments within the division. For example, the offices of Diversity and Women's Programs and International Students and Scholars now report directly to the vice president for greater visibility and stature. A full-time Director of the Office of Disability Services works with students with disabilities to coordinate support from all divisions on campus. The offices of Counseling, Health Services, Alcohol and Drug Education, and Disability Services are aligned as an integrated unit that reports to the Assistant Dean for Student Development.

The Dean of Students and his staff coordinate a wide array of services, programs, and activities designed to support the academic success and personal development of WPI students. The goal is always to provide guidance and assistance to students by helping them to problem solve or by referring them to the appropriate resources.

⁹ WPI's FERPA policy, available at www.wpi.edu/offices/policies/ferpa.html, requires that grades be sent to the parents of any student not financially independent.

In summer 2009 a group of senior leaders in Academic Affairs, Academic Advising, and the Office of the Dean of Students began meeting to identify strategies to maintain and improve program quality during the period of effervescent growth. Since that time, this positive and solution-driven group has continued to meet on a biweekly basis, resulting in a stronger partnership between Academic Affairs and Student Affairs in addressing student needs and issues across the institution.

WPI policies and the Campus Code of Conduct¹⁰ are articulated in the Student Planner and Resource Guide, which is sent to WPI students through campus mail. In the past year, the Office of the Dean of Students worked with the undergraduate Student Government Association and the Graduate Student Government to improve the contents and layout of the guide. Based on student feedback, the distribution plan has been altered so that all incoming undergraduate and graduate students receive a hard copy of the publication, and all continuing undergraduate and graduate students receive an electronic message directing them to an online version.

Other campus judicial policies, particularly the Academic Honesty policy and associated procedures, are shared with faculty during New Faculty Orientation and lunchtime “Food for Thought” sessions sponsored by the Morgan Teaching and Learning Center. Every faculty member receives a comprehensive summary of academic honesty statistics each year, along with a copy of the Academic Integrity Guide for Faculty.¹¹ An overview of academic honesty and judicial policies is presented at orientation programs for new graduate students and new international students each year.

The Associate Dean of Students works in close partnership with the Director of Graduate Admissions and the Dean of Graduate Studies to provide comprehensive support for the graduate student population. In 2010-11, the graduate and undergraduate calendars were aligned for the first time, so that classes start and end on the same day and vacation periods coincide. This has been a very positive change and addresses some of the historic concerns that graduate students have expressed. The Associate Dean serves as the advisor to the Graduate Student Government. One of the current initiatives is to enhance graduate student involvement and satisfaction with campus life, opening all student organizations to graduate student involvement.

Residential and Dining Services

These two offices have made major changes to adapt service and maintain quality of life for all students at WPI. Recognizing that student learning takes place throughout the living environment, the Residential Services staff supports student learning by providing both space and programming for personal and intellectual growth.

As the student enrollment has increased, alterations and renovations have been made to the residence halls to accommodate student housing needs. Rooms that were formally doubles were furnished with entirely new, more efficient furniture to convert the rooms to triples. Having maximized the capacity of our current housing facilities, we are in the planning stages for an additional residence hall to meet the growing demand for student housing.

The most significant change in student housing in the last 10 years was the opening in 2008 of East Hall, a 232-bed residence hall for upperclass students. The building was built with a green roof and other sustainable elements, which gained it LEED Gold certification.

In 2005, the department made the transition from a student hall director model to professional live-in staff on campus. The changes in staffing structure has provided better support and supervision for the resident advisors and helped build a stronger residential community. The department has also created a residence hall

¹⁰ Available in the Workroom and at www.wpi.edu/offices/policies/judicial/sect4.html.

¹¹ The report and the guide are available in the Workroom.

council that plans activities for the entire campus population, advocates for students living in the residence halls, and provides leadership experience and training to residence hall students.

Over the past 10 years we have added three new dining operations, including a campus center, a convenience store, and a library café. We also converted one dining hall to a restaurant where faculty and staff may join undergraduate and graduate students for meals and special events. The Goat's Head Restaurant has helped expand mid-week programming to build a stronger sense of community among students. In spring 2012, a renovation and expansion of the main residential dining hall is planned to accommodate the growing student population.

An active Dining Service Advisory group, which includes members of student government, staff, and faculty, meets quarterly to discuss dining service ideas and future programming. The entire campus is surveyed twice a year and feedback is used to modify dining programs on campus.

Diversity and Women's Programs

The Office of Diversity and Women's Programs focuses on the retention and academic, social/personal, and preparation for professional success of our women and underrepresented students. Engagement with these populations begins with pipeline programs for middle- and high school students and continues through programs for alumni. Once two separate offices, Diversity Programs and Women's Programs have merged into a single department and now work collaboratively to ensure the overall success of their respective populations.

Over the last 10 years the number of women undergraduates at WPI has increased significantly, from about 23 percent in 2001 (about 600 undergraduates) to over 30 percent (about 1,000 undergraduates) today. As this population has increased, the programming offered by the Office of Women's Programs has changed to meet the evolving needs of women on campus. Before a critical mass of women was reached, the programming offered was fairly basic and focused on social outlets where women could build friendships and camaraderie. As the number grew, the programming evolved to include professional development and mentor opportunities, through programs like the Women's Industry Network. Most recently, the popularity of these programs has decreased and programming now focuses primarily on leadership development to help women graduate with skills that will serve them well in the workforce.

The Excellence in Mathematics, Science, and Engineering Program (EMSEP) continues to provide a comprehensive network of support services for students of color while enrolled at WPI. The program was started in 1993 and continues to be very effective in meeting the needs of first-year students, but participation has dropped off in the junior and senior years. The current director is developing new programs to meet the changing needs. The Oasis Cultural Center opened in 2004-05 and has grown into a place where underrepresented students gather in community to relax, study, and attend programs.

International Students and Scholars; English as a Second Language

The International House provides ongoing programs and essential services to assist, educate, and support international students and scholars in their transition to U.S. society and academic culture. It provides professional expertise and ensures student and institutional compliance with federal immigration and employment regulations.

The rapid growth in the international student population over the past five years, coupled with changes in immigration regulations and tracking requirements, resulted in the creation of the position of International Student Advisor in 2009. Working in collaboration with the Student Development and Counseling Center, new programs have been developed on culture shock and a cohort of international students completed the Student Support Network training. The department works with the Career Development Center to offer

specialized programs for international students, and offers a series of basic tax workshops to assist students in navigating this foreign process.

The ESL Program continues to be responsive to the trends and specialized needs of this group of international students. In collaboration with the Department of Management (now the School of Business), a new program for international graduate management students focusing on oral communication was created. This program was developed as the department increased its number of full-time Chinese students (who now make up 41 percent of the international student population at WPI) and noticed that some of these students did not participate in class discussions as the faculty expected. In 2008 the International Teaching Assistant (ITA) Conversation Partner Program was established to pair native English-speaking undergraduates with ITAs. Last year a section for management students was added pairing management students for whom English is their first language with primarily Chinese-speaking management students.

Student Development and Counseling

The Student Development and Counseling Center (SDCC) provides educational programming and training, counseling, referral, advocacy, and crisis intervention services to the entire WPI community. Programs assist students in their full and complete development as they continue the process of becoming adults and grow into their roles, relationships, and responsibilities as members of the larger global society.

The new Outreach Coordinator provides strategic direction, developing a range of community based-programming that has made the campus safer and improved overall student well-being. A full-time counselor was added to the staff in 2008 to meet the increasing demand for services. In the past few years, the Assistant Dean for Student Development has assumed leadership for the Health Center, for Alcohol and Drug Education, and the new Director of Disability Services.

The SDCC's overall work on suicide prevention and student wellness promotion over the past five years has been, perhaps, the SDCC's most significant accomplishment. In particular, the development and evolution of our Student Support Network (SSN) Program has been an outstanding achievement. Over 300 students at WPI have been trained in how to best recognize and respond to peer distress in the SSN program. SSN has been listed as a "best practice" by the Suicide Prevention Resource Center and WPI has become known nationally for our accomplishments in developing and implementing effective peer programming.

Leadership Programs

Leadership programs have grown over the last decade, with assessment, theory, collaboration, and involvement at the core. Within the last five years, the program has been assessed several times and compared to professional standards in higher education. Assessment led to new programs, including a leadership lecture series, as well as growth in existing programs like the Leading Edge Series. The program has been a collaborative effort including faculty, staff, and students who create leadership opportunities on campus. In the spring of 2011 the student leadership organization Omicron Delta Kappa Society colonized on the campus. Programs now use pre- and post-assessments to ensure learning outcomes have been achieved and are reviewed annually.

Community Service

Community service is very strong in the WPI community. First, many of the junior year interdisciplinary projects (the IQP described in Standard Four) are completed for an external sponsor. In the last year alone, more than 110 WPI students logged more than 30,000 hours on projects for local government and nonprofit organizations through the Worcester Community Project Center.¹² In total, more than 500 students completed this interdisciplinary project at an off-campus project center.

12 The WCPC is supported by the Global Perspective Program; visit www.wpi.edu/academics/Depts/IGSD/WCPC/events.html.

WPI students also contribute community service outside the academic projects program and hours recorded by our students have increased significantly over the last 10 years. In 2005 only 6,000 hours were recorded, but in 2010 students completed 31,383 hours of community service and raised over \$114,910 to benefit local and national charities. Students who receive Federal Work Study funds must complete 15 hours of paid community service—last year these students provided service to 20 nonprofit organizations.

Athletic Programs

Though the Athletics Program is not structurally part of the Division of Student Affairs, it supports an important component of student life at the university. WPI appointed the first female Athletic Director in 2001 and has seen significant growth in the number of sports clubs (from 18 in 2001 to 33 today) with student involvement increasing from 25 percent to almost 50 percent today. Varsity athletics programs have become much more competitive in recent years, with WPI winning the Worcester Cup six of the last eight years. The Sports and Recreation Center under construction was designed to help the needs of a student community that is more diverse than the student body of the late 1960s, when Harrington Auditorium was built.

Additional Services

There are several more offices dedicated to providing special support and enhancing student life at WPI. For example, ***Health and Wellness Services*** has increased staffing to address the increased enrollment. The diversified department now offers more wellness-related programs, including Registered Dietician, Physical Therapy, Sports Medicine, and Massage and Progressive Relaxation.

Alcohol and Drug Education has been and remains a high priority in the division. The Healthy Alternatives program has grown over the past 10 years, as we have successfully integrated our education, prevention, and intervention efforts through the use of an online alcohol education program for new students, a brochure for parents about alcohol on campus, and regular interaction with parents of students who have violated the university alcohol policy. The transition of AOD (Alcohol and Other Drugs) Programs to SDCC has permitted greater integration with the Student Support Network and peer education efforts.

In 2001, the Campus Center was a new addition to the campus. A point was made in the 2001 Self-Study that the building was nothing without intelligent programming. The ***Campus Center*** and ***Student Activities Office*** provide opportunities for involvement and student leadership, programs that nurture personal growth and community development, and services that enhance life at WPI.

The Campus Center is heavily utilized: event reservations totaled 36,000 hours for the last academic year. The Campus Center and Events offices have merged into a single department, resulting in a more streamlined approach to scheduling and event planning. The department completed an External Review of the Campus Center and Student Activities Office in 2008. The department has also completed two internal reviews using the Council of Assessment Standards as a component of our review of all of our programs.

Over the last decade student activities on campus have grown significantly. In the last five years the number of student organizations has increased from 135 to over 200, and new programs, such as the Homecoming Cup Competition, have been created to deepen school spirit and build community. Most programs are supported by identified learning outcomes that are assessed regularly to ensure student growth and program achievement. Technology has altered the way students share information, particularly through the use of social media such as Facebook, Twitter, LinkedIn, and blogging; the department has created resources that allow for instant communication with a larger student population. Most recently, a new online portal system, OrgSync, has begun to help student organizations build online communities more efficiently.

Currently, over 32 percent of the student population (and over 40 percent of women) is affiliated with one of WPI's 18 fraternities and sororities. The Director of Student Activities coordinates programs for

these organizations. In spring 2005 the Board of Trustees asked that a Greek Life Task Force¹³ be created to thoroughly examine Greek Life at WPI. Because of the excellent improvements thus far, the WPI Greek community received the Association of Fraternity/Sorority Advisors Outstanding Change Initiative Award in 2009. In addition to improvements in specific chapters, the Greek Alumni Council (GAC) now hosts or sponsors a number of events, including a leadership conference, education on code compliance, and an annual awards program honoring excellence in the fraternity and sorority chapters.

The economy has changed significantly and our graduate placement statistics have followed the national trend, although students majoring in STEM disciplines have more job offers at better salaries than the average. The **Career Development Center** (CDC) has taken several actions to adapt to the needs of our students and of industry. For example, the CDC created a second career fair dedicated to Biotechnology and Bioengineering careers. It has added a full-time position to focus on alumni career development. In response to the addition of new academic majors, the department now has a staff member dedicated to employer outreach/job development for new majors. New liaison programming focuses on collaborating with academic departments and student organizations on career-related topics.

Four years ago, the CDC brought in outside consultants from the career services industry for an external review of all programs and services. The CDC completes employer and student evaluations of large-scale events, such as career fairs. The Student Advisory Council meets four times a year and has representatives from all class years providing student feedback on CDC programs and services.

Projections

A Retention Task Force, which includes faculty and staff from Academic Affairs, the Division of Enrollment Management, and Student Affairs (Dean of Students), was formed 2007. While first-to-second year retention has improved steadily in recent years (reaching 95 percent in each of the last three academic years), WPI's four- and six-year graduation rates still leave room for improvement. The initial work of the task force was to review the students who were very close to graduation (by a few courses or a single project) and explore ways to help these students over the threshold. The task force has continued to review and recommend special programs for students who find themselves in academic difficulty.

As our undergraduate population has increased, we have become aware of the need for changes in our academic advising model. One recent change is the addition of an Assistant Director of Academic Advising for Preprofessional Programs to address the special needs of pre-health, pre-law, and pre-teaching students. Juniors and seniors are well served by faculty advisors in their majors, and faculty—especially faculty in the departments which have seen the most growth—should focus more of their advising time on this population. The Insight Advising program works well for first year students, but sophomores tend to be less connected to their academic advisors. Discussions are just beginning on plans to better support the academic advising needs of students in the sophomore class. Searches have begun for two faculty positions to support academic advising needs of students in the sophomore class.

WPI has seen growth in the diversity of the student population, with greater numbers and percentages of women, underrepresented minorities, and international students. The growth has not only increased the demands on programs to support these groups, it has changed the nature of support required. More and more student leaders are now women and minorities. Both groups are much more visible on campus and are part of the mainstream as well as pioneers of new organizations. We colonized our first multicultural sorority in the last year, and established our first multicultural fraternity in 2009. President Berkey created the President's Council on Support for Women and Minorities at WPI, which meets regularly to assess and address the quality of life on campus for these groups.

13 The full report is in the Workroom and an executive summary is at www.wpi.edu/Images/CMS/SAO/oltrfreport.pdf.

Standard 6: Students						
(Admissions, Fall Term)						
Credit Seeking Students Only - Including Continuing Education						
	F'08	F'09	F'10	F'11	F'12	
	2 Years	1 Year	Current	Next Year	2 Years	
	<u>Prior</u>	<u>Prior</u>	<u>Year</u>	<u>Forward</u>	<u>Forward</u>	
	(FY 2 009)	(FY 2010)	(FY 2011)	(FY 2012)	(FY 2013)	
Freshmen - Undergraduate						
Completed Applications	5,706	6,284	6,660	7,049	7,049	
Applications Accepted	3,803	3,989	3,933	3,998	3,900	
Applicants Enrolled	907	925	910	1,039	900	
% Accepted of Applied	66.6%	63.5%	59.1%	56.7%	55.3%	
% Enrolled of Accepted	23.8%	23.2%	23.1%	26.0%	23.1%	
Percent Change Year over Year						
Completed Applications	-	10.1%	6.0%	5.8%	0.0%	
Applications Accepted	-	4.9%	-1.4%	1.7%	-2.5%	
Applicants Enrolled	-	2.0%	-1.6%	14.2%	-13.4%	
Average of Statistical Indicator of Aptitude of Enrollees: (Define Below)						
GPA	3.72	3.75	3.80	3.82	3.80	
Transfers - Undergraduate						
Completed Applications	168	189	199	210	210	
Applications Accepted	74	75	82	62	62	
Applications Enrolled	32	31	37	36	36	
% Accepted of Applied	44.0%	39.7%	41.2%	29.5%	29.5%	
% Enrolled of Accepted	43.2%	41.3%	45.1%	58.1%	58.1%	
Master's Degree						
Completed Applications	1,191	1,500	1,761	2,685	3,400	
Applications Accepted	723	959	1,072	1,311	1,350	
Applications Enrolled	289	431	474	575	600	
% Accepted of Applied	60.7%	63.9%	60.9%	48.8%	39.7%	
% Enrolled of Accepted	40.0%	44.9%	44.2%	43.9%	44.4%	
Doctoral Degree						
Completed Applications	530	577	585	674	774	
Applications Accepted	290	353	291	357	400	
Applications Enrolled	59	59	45	69	80	
% Accepted of Applied	54.7%	61.2%	49.7%	53.0%	51.7%	
% Enrolled of Accepted	20.3%	16.7%	15.5%	19.3%	20.0%	

Standard 6: Students						
(Enrollment, Fall Census Date)						
Credit-Seeking Students Only - Including Continuing Education						
		F'08	F'09	F'10	F'11	F'12
		2 Years	1 Year	Current	Next Year	2 Years
		<u>Prior</u>	<u>Prior</u>	<u>Year</u>	<u>Forward</u>	<u>Forward</u>
		(FY 2009)	(FY 2010)	(FY 2011)	(FY 2012)	(FY 2013)
UNDERGRADUATE						
First Year	Full-Time Headcount	904	918	910	1,013	900
	Part-Time Headcount	3	1	-	-	-
	Total Headcount	907	919	910	1,013	900
	Total FTE	905.0	919.0	910.0	1,013.0	900.0
Second Year	Full-Time Headcount	742	851	865	850	947
	Part-Time Headcount	4	9	3	5	5
	Total Headcount	746	860	868	855	952
	Total FTE	744.0	855.0	866.0	852.0	949.0
Third Year	Full-Time Headcount	668	692	789	792	785
	Part-Time Headcount	15	11	22	16	16
	Total Headcount	683	703	811	808	801
	Total FTE	673.0	696.0	798.0	798.0	791.0
Fourth Year	Full-Time Headcount	590	660	691	754	766
	Part-Time Headcount	58	75	77	70	70
	Total Headcount	648	735	768	824	836
	Total FTE	613.0	689.0	721.0	781.0	793.0
Unclassified	Full-Time Headcount	161	152	161	158	158
	Part-Time Headcount	15	22	19	19	19
	Total Headcount	176	174	180	177	177
	Total FTE	167.0	161.0	168.0	165.0	165.0
Total Undergraduate Students						
	Full-Time Headcount	3,065	3,273	3,416	3,567	3,556
	Part-Time Headcount	95	118	121	110	110
	Total Headcount	3,160	3,391	3,537	3,677	3,666
	Total FTE	3,102.0	3,320.0	3,463.0	3,609.0	3,598.0
	% Change FTE Undergraduate	na	7.0%	4.3%	4.2%	-0.3%
UG FTE=FT+(0.392857)*PT						
GRADUATE						
	Full-Time Headcount	363	437	528	623	735
	Part-Time Headcount	625	716	826	975	1,150
	Total Headcount	988	1,153	1,354	1,598	1,885
	Total FTE	602.0	711.0	844.0	996.0	1,174.0
	% Change FTE Graduate	na	18.1%	18.7%	18.0%	17.9%
GR FTE=FT+(0.382059)*PT						
GRAND TOTAL						
	Grand Total Headcount	4,148	4,544	4,891	5,275	5,551
	Grand Total FTE	3,704.0	4,031.0	4,307.0	4,605.0	4,772.0
	% Change Grand Total FTE	na	8.8%	6.8%	6.9%	3.6%

Standard Seven: Library and Other Information Resources

Introduction

WPI's research-intensive undergraduate and graduate programs, with their real-world project focus, require competent information seekers and skillful technology users. These programs, and WPI's overall educational mission, are supported by a variety of library spaces and services and the Gordon Library's robust print and digital collections, coupled with strong technical systems and services from the Office of Information Technology (IT).

Library: Description

Service and Staffing

Several significant changes took place within the Gordon Library and the Office of Information Technology (IT) over the past 10 years. Driven, in part, by huge shifts in the use of technology in higher education, these units installed a variety of new systems and underwent staffing and organizational changes. Library and IT managers worked together closely to identify areas of growth and innovation in their respective fields. Collaborative programs to provide instructional support, infrastructure, and resources included expanding our involvement with Internet 2, shifting library collections from print to digital, and developing many information technology and library virtual services.

Extensive renovations, completed between 2008 and 2010 at a cost of approximately \$1.2 million, leveraged the combined resources of the Library and IT to provide students greater access to technology tools and services within the Library. As part of a new information commons, the Library now houses two IT units: the Technology Helpdesk and the Technology for Teaching and Learning Group. Over the past 10 years, the Library has also added 11 collaborative spaces for student project teams.

The Gordon Library underwent an internal reorganization in July 2010 that placed the staff into five departments: Research and Instruction, Access Services, Collections Management, Technology and Electronic Resources, and Archives and Special Collections. The Library employs 10 full-time professional librarians, four part-time librarians, and seven support staff. In comparison to library staffing rates at other members of the Association of Independent Technological Universities (AITU), WPI stands at the midpoint of support. Approximately 45 student employees assist with operations in the Library, which is open 104 hours per week during the regular academic year. During exam periods and breaks, the Library provides extended hours to accommodate graduate students and extra volume.

Demand for instruction services has increased by 100 percent over the past six years, from 242 sessions in 2005-06 to 540 sessions in 2010-11. Research consultations have increased by over 100 percent, from 118 research consultations in 2005 to 296 consultations in 2010. To address increasing demand and fulfill the core library (and institutional) mission to support teaching, learning, and scholarship, a new **Research and Instruction** department was created during the most recent reorganization in 2010. Staff members from other library departments were reassigned and four full-time and two part-time librarians, (plus the Associate Director), provide support for information literacy, research, and instruction, primarily for undergraduates.

With one librarian and four staff members, **Access Services** now encompasses circulation, reserves, interlibrary loan, and document delivery. Increased emphasis on library systems and electronic resources led to the creation of the **Technology and Electronic Resources** department, which has two librarians who work closely with colleagues from IT. The **Collections Management** department, with one full-time and one part-time librarian and two staff members, oversees selection, access, and preservation of all collections, print and

digital. These include student publications, starting with the theses written by the first graduating class, in 1871, to the most recent digital project submissions. The **Archives and Special Collections** department has one staff archivist managing the college's records, manuscripts, and artifact collections.

Improvements to Space

The renovation project noted above provided enhanced spaces for computer and information literacy programs, and expanded group spaces for student project teams, while preserving the traditional library information services, instruction, and collections (space was even found to create a popular library café). As a result, the Gordon Library can offer students more technology-enabled spaces (eight in place; three recently completed) and more integrated technology and information support services. Usage of the building (as measured by gate counts) has doubled in the past five years, from approximately 6,000 people entering the Library per week in 2006 to an average of 12,000 in 2011. In addition to the gate counts, building usage is monitored by having students count patrons on each floor three times per day, recording the information on printed floor plans.

The Library's physical plant is aging, and some of its original (circa 1967) structural and mechanical components are deteriorating. WPI recently addressed some of the most critical issues: replacing the roof, caulking all exterior windows, replacing florescent bulbs to increase energy efficiency, and installing portable dehumidifiers in Archives and Special Collections. The Library staff meets regularly with WPI's Facilities Department concerning all ongoing maintenance and building improvement issues.

User Support and Instruction

WPI students use information resources and technology throughout their academic careers, attaining levels of proficiency as they progress through the curriculum. Librarians and academic technologists work with students at various levels, especially through their project experiences. For example, in fall 2010, 250 first-year students received information literacy instruction as part of the Great Problems Seminars; another portion acquired instruction during Humanities and Arts Inquiry Seminars. Just over half of all undergraduates receive instruction within their Interactive Qualifying Project (IQP) experience, largely through the Global Perspectives Program, which provides information literacy education as part of a research methods preparation course.

In the summer of 2010, the newly created Research and Instruction Department expanded delivery of instructional programming. Program statistics for the past seven academic years are listed in the following table.

Student Participation in Research and Instruction Programs

Type of Session	Academic Year						
	2005	2006	2007	2008	2009	2010	2011
Course-embedded instruction sessions	117	124	140	139	175	187	212
IQP team consultations (included in above course embedded sessions)	65	83	101	88	103	134	129
Research consultations (not required by instructor)	n/a	118	125	145	162	297	328
Total sessions	n/a	242	265	284	337	484	540

Librarians were involved in the development and design of the Great Problems Seminars (GPS). GPS project teams may work under the tutelage of “personal librarians,” who support each of the GPS courses and each project center within the Global Perspective Program. The recently revised Humanities and Arts requirement increased demand for library collections to match newly developed courses on specialized topics.¹

Collections

Trends in information delivery have drastically changed over the past 10 years. The Library’s collection of 321,821 printed books, almost 2,500 films, and over 2,000 linear feet of archival materials now blends with more than 300,000 electronic book titles. Providing access to approximately 56,300 electronic journals and over 100 specialized databases consumes more than half of the entire library budget. During the past two years, library staff added links to more than 200,000 open-access books and journals to the library catalog. The Library supports and investigates many alternative forms of scholarly publication, regularly seeks feedback from faculty on information needs, and reviews usage annually.

In 2007 the WPI faculty mandated electronic submission for all undergraduate project reports (Interactive Qualifying Projects, or IQPs), and Major Qualifying Projects, or MQPs. A similar mandate for graduate theses and dissertations was formalized in 2003. The Library and IT staff established an online archive for these reports and the Library stores them as “born digital” documents.² The Library is currently scanning printed reports dating back to 1999, and plans to digitize the historical collection of early student theses as funds allow. The Library tracked 241,667 downloads of IQP and MQP reports between July 1, 2009, and June 30, 2010. In addition, over 200,000 downloads were tracked for master’s and PhD dissertations. Digitization efforts are also under way to scan special collections, such as the Theo Brown Diaries and the Robert D. Fellman Dickens Collection.³ Grants have helped make this work possible.

Ensuring Equal Access to Resources

Technology advances continue to expand access to digital resources in a variety of formats for students on and off campus. Library electronic or virtual resources are accessible through WPI’s virtual private network, terminal services, and proxy services. Video tutorials, subject- and topic-based lists of resources, and instructions on how to use library materials are available online. The Library sends print versions of materials to distance learning program students who request them through electronic or manual (postal) processes.

Library Systems

In the past, library systems at WPI provided up-to-date services and resources through a “best of breed” strategy that was well supported by IT. Currently, the Technology and Electronic Resources staff oversees 22 separate software packages provided by 13 vendors.⁴ In response to external factors, such as Google and e-book publishing, and internal issues, such as “one-off” digitization projects that are nearing end-of-life, the Library faces significant challenges. In addition to developing strategies for long-term preservation of digital special collections and online archives, the Library faces major choices concerning systems in the near future. These include replacement of the core software (Voyager), migration of the Library website from HTML to a content management system, consolidation and expansion (using industry standard metadata structures) of digital collections, implementation of an institutional repository, and installation of additional mobile applications.

1 A report on the Information Literacy and Instruction Program is available in the Workroom.

2 The online IQP and MQP collection may be browsed at www.wpi.edu/Academics/Library/Collections/Projects/; electronic theses and dissertations are located at www.wpi.edu/Pubs/ETD/.

3 The Brown and Fellman collections may be viewed at www.wpi.edu/Academics/Library/Archives/digitalcollections.html.

4 A full list of these software packages is available in the Workroom.

A few key services added over the past several years:

- **FullTextFinder** provides, via OpenURL technology, seamless integration of links to full text journals and other resources found within web search engines and library databases.
- **QuickFIND** is a federated search portal to multiple library research databases.
- **ILLiad** enables express interlibrary loan service.
- Expedited electronic document delivery offers fast access to research resources.

Collaborations

The Library staff fosters collaborations with internal and external partners. Within WPI, librarians collaborate extensively with staff from IT (Academic Technology Center, Technology Helpdesk, and Research Computing), administrators in Academic Affairs, faculty, and student organizations. Librarians serve on many campus and professional organization committees. Following are examples of significant collaborative efforts:

- Librarians have co-advised student projects that have led to increased use of special collections as well as assessment of library services and students research skills.
- The Academic Technology Center/Library Liaison program provides a conduit for outreach to academic departments with liaisons assigned to specific departments.
- The Dean of Library Services serves on the board of the E-Science Portal advisory board (a University of Massachusetts Medical School Library–National Library of Medicine initiative), which helps educate librarians and library users on e-science and the development of the cyber infrastructure to support data management.
- The Gordon Library and Lamar Soutter Library at the University of Massachusetts Medical School jointly applied for and received an Institute of Museum and Library Service National Leadership Planning Grant; the two libraries are developing an instructional framework and delivery system for online instructional modules on preserving, managing, and sharing digital data.
- Longstanding reciprocal borrowing agreements with area libraries and research centers provide additional services and resources.
- Library staff present at national, regional, and local conferences, such as the New England Library Instruction Group, Massachusetts Library Association, the Association of College and Research Libraries, New England Chapter, American Society for Engineering Education, and the Northeast Regional Computing Program (NERCOMP).

Library: Appraisal

Assessment efforts are under way to understand not only use of the Library and satisfaction with services, but also to understand acquisition of information and digital literacy skills.

Assessing Library Services

Results from the Merged Information Service Organization (MISO)⁵ survey indicate high use and perceived importance of the Gordon Library. Over 200 WPI students responded to the survey in February 2010.

Detailed questions asked about frequency of use and importance of library and IT services and resources:

- 87% of respondents use library services at least once per semester. Of these, 40% use overall library services one or more times per week.
- 90% feel library services are somewhat important, important, or very important. Of those, 50% chose “very important.”
- Nearly 88% reported being satisfied or somewhat satisfied with overall library services.

⁵ www.misosurvey.org.

Librarians added the following question to the survey: *To whom do you turn when you are not finding the information resources you need for course projects?* The responses indicated that WPI students turn most often to their peers, followed by instructors, librarians, and family members. This supports research published by the Project Information Literacy⁶ researchers.

The MISO survey also revealed a lack of awareness of copyright education options. Only 7 percent of students felt that they were very informed about where to turn for questions concerning copyright and fair use. To address this lack of awareness and to educate students on the ethical use of information, the staff offers a research workshop each term on copyright topics. There is additional information about copyright and fair use posted weekly on the library blog and on social media outlets.

Earlier, in 2006, the Library surveyed users with LibQUAL[®] and learned that an area of high student interest was expansion of library service hours. Because of that survey and improved methods of data collection, library hours have been adapted to meet student needs.

The WPI Student Government Association (SGA) conducts an annual survey to evaluate academic services and technology. The Library contributes questions to the survey and receives copies of the results. Results from the SGA and an annual Noel-Levitz survey show that students rate library service highly and indicate satisfaction with resources.⁷

Assessing Student Learning

Librarians work routinely with faculty to assess information literacy. The Gordon Library's vision for information literacy maps the research education program with WPI's mission and goals, statement of values for undergraduate education, and undergraduate learning outcomes.⁸ While there is no guarantee that library instruction reaches each student, librarians are actively teaching information literacy and research strategies to target areas, including the research-intensive projects and courses. Librarians meet with all Great Problems Seminars students (first year) and all global project students (junior year), and teach in many Humanities and Arts Inquiry Seminars and various other classes.

A 2008 evaluation of the Great Problems Seminars conducted by the Donahue Institute at the University of Massachusetts⁹ included questions on the impact of library instruction. To a greater extent than non-GPS students, GPS students indicated that their learning during the first year involved using information ethically and using library research tools.

The Manager of Instruction and Outreach (now the Associate Director for Research and Instruction) and the Dean of Undergraduate Studies have co-advised projects that developed an in-house test to assess baseline information literacy skills of first-year students. A follow-up project was completed in 2010-11. Preliminary results show that students did better on the questions related to ethical use of information and less well on questions related to search strategies. Further revised testing occurred in spring 2011, which assessed student learning during the first year at WPI. This project will continue in 2011-12.

WPI students accepted into an off-campus project center are required to take the ID2050 class prior to leaving campus. This class includes librarian-directed instruction. Student responses to the ID2050 evaluation surveys indicate that research librarians have an impact on their learning for their global project experience.

⁶ www.projectinfolit.org.

⁷ The SGA and Noel-Levitz survey results are available in the Workroom.

⁸ Discussed in Standards Two and Four.

⁹ Available in the Workroom.

Student self-evaluations indicate that librarian involvement enhanced their development of information literacy skills. When surveyed, 96 percent of the students agreed or strongly agreed that the research consultation with the librarian improved their ability to perform research for their projects. Sixty-three percent agreed or strongly agreed that the Research Circuit online tutorial improved their ability to perform research for their projects; however, 13 percent said that the online tutorial did not help them improve their skills.

Library Professional Development

Library staff has the opportunity to attend local, regional, and national conferences to improve their professional practice and keep abreast of current trends. Staff members also organize internal training sessions regularly to provide peer-to-peer instruction, they attend webinars, and they learn from visiting vendor presentations. The Library subscribes to a number of professional journals, and most staff hold personal membership in professional organizations. Staff members hold office and participate in regional organizations, such as the Association of College and Research Libraries (ACRL/NE) and the Massachusetts Library Association (MLA). Staff frequently present at events organized by such groups as the New England Library Instruction Group (NELIG), ACRL, ASEE, and NERCOMP.

The Library staff meets regularly and has the opportunity to lead discussions on current topics, share ideas, and keep up-to-date on library activities and programs. Planning meetings and exercises are scheduled quarterly and involve outside consultants, other WPI departments (Human Resources, Academic Affairs), and other leading librarians presenting on topics critical for positive change. The Library staff updates the Massachusetts Board of Library Commissioners (MBLC) Strategic Plan annually and produce statistics for the Library's annual report.¹⁰

Library: Projection

Aligning with User Needs

The Library formed a Student Advisory Committee in 2009 with undergraduate and graduate student representatives. In 2010, as the Academic Technology Center and the Technology Helpdesk moved into the library building, the student advisory group expanded in scope and now serves as an advisory body for all departments housed in the building.

Strategic Planning

The Library updates a comprehensive long-range plan and submits any changes to the Massachusetts Board of Library Commissioners.¹¹ In addition, the staff undertakes ongoing planning processes and invites library leaders to speak at meetings on a variety of topics. The most recent set of library goals, described below, receive continual review.

Internal Goals

The first goal is to ***build, sustain, and preserve services and collections*** that support teaching, learning, research, and scholarship. Changes in the nature of scholarly communication mean staff must be agile in adapting and teaching within rapidly changing information ecosystems. Librarians must also be prepared to inform faculty about the new systems and encourage their use.

¹⁰ The latest annual report is available in the Workroom.

¹¹ The current Library long-range plan is available in the Workroom.

New interdisciplinary academic programs, such as Bioinformatics and Computational Biology and Robotics Engineering, plus growth in programs such as Biomedical Engineering at the undergraduate level, and expansion of existing programs at the graduate level (Business, Learning Sciences, Interactive Media and Game Development) demand greater library support. Currently, library support focuses primarily on the undergraduate students and curriculum.

Open access academic journal publishing and other models of scholarly communication offer great opportunities for wider access to the knowledge created by WPI faculty and students. Ongoing assessment of the collections for strengths and weaknesses provides important data for purchasing decisions.

The second goal is to *continue enhancements in library spaces*. The recent improvements to the library building have helped achieve this goal, but more needs to be done. For example, the ground floor has been partially renovated, enabling the Archives and Special Collections to be integrated into one attractive and functional space, but problems persist in climate control for this area. In addition, structural issues were identified by an engineering service contracted to evaluate the building in 2010 (the Facilitates Condition Assessment Plan being developed for the university by Strategic Building Solutions, which is discussed in Standard Nine).

Feedback from the MISO survey indicated that students attach high importance to the provision of group workspaces. As library staff continue to assess physical spaces, maintain quiet study spaces, and consider adding group study areas, significant additional renovations may become necessary.

The Library's third goal is to *use technology wisely* to ensure the broadest access by the WPI community to scholarly information resources. Many important changes to the library systems will take place over the next three years. A resource discovery layer, implemented in the summer of 2011, will simplify access to print and electronic library materials. A significant area of concern is the lack of an institutional repository for WPI's intellectual and scholarly output. Another upcoming project will replace the Voyager integrated library system. To implement any changes, the Library will need programming support, either from IT or through the addition of library staff with the necessary technology skills.

A new library website redesign committee has worked with WPI's Marketing and Communications Division to plan for the near-term migration of the library website to WPI's content management system. As more students and faculty access information with mobile technologies, the Library is working to provide information and support for mobile devices.

The Library's Research and Instruction Department has collaborated with faculty and IT Research Computing to develop templates and procedures to help faculty meet the mandatory National Science Foundation (NSF) requirements to create a Data Management Plan for every new grant proposal. (See the IT section below for more on this new requirement.) With the addition of the Gateway Park research facility and faculty, we have seen an increase in research grant proposals. This trend will drive the need to provide increasingly complex tools to support the publishing of final research reports and the supporting data sets and metadata associated with those works.

External Goals

The first external goal identified is to ***encourage staff effectiveness, efficiency, and productivity*** by incorporating routine assessment practices into Library service delivery. Increased demand for instruction, digital asset management, and implementation of emerging technologies will result in the need for additional staffing. The Library needs staff with expertise in these emerging technologies but also lacks staff with scientific backgrounds to support researchers at WPI.¹²

The second goal is to ***build on the connections between IT and library departments*** that fully exploit opportunities to advance learning and research through technology. The Library provides a wide array of information resources to support all programs at all levels, from first year to doctoral to faculty research.

The third goal is to ***optimize financial resources***. To accomplish this, the Library will conduct thorough reviews of its collections and resources to support existing and proposed academic programs, analyze detailed usage data, and exploit opportunities to use low-cost methods to provide information access for Library users.

Information Technology: Description

The Information Technology (IT) Department provides a wide variety of systems and services to support the academic mission of the university. With an annual operating budget of approximately \$8.3 million, IT employs 58 professional and administrative staff members who are organized into five units: Enterprise Solutions/Information Systems; Hosting and Support Services; Network Operations, Information Security, and Telecommunications; Research Computing; and the Academic Technology Center (ATC). In addition, 79 students (approximately 16 full-time equivalents) assist IT staff with providing support services. The Enterprise Solutions/Information Systems, Hosting and Support Services, and Network Operations, Information Security, and Telecommunications units are described in Standard 8 as they relate to WPI's physical and technological resources.

ATC works with faculty, students, and staff on the use of instructional technologies to enhance teaching and student learning. ATC staff work closely to support WPI faculty members with the development and on-going maintenance of traditional classroom-based instruction, as well as blended and distance courses. In addition, ATC provides multimedia services, poster printing for student projects, and AV support for campus events.

The Technology Helpdesk provides support for administrative and academic software and systems to members of the community—electronically, via phone, and in person. As noted above, the Helpdesk and the Technology for Teaching and Learning team moved to the Library in August 2010. The WPI community has welcomed this move to a more central location, which provides easier access and visibility and has generated increased walk-up traffic.

The Research Computing team's efforts to support the academic program are detailed in the "Faculty Support" section below.

¹² An analysis of AITU benchmarking data of library staffing levels is available in the Workroom.

Information Technology: Appraisal

IT seeks to understand the needs of our users to best allocate resources and to deliver appropriate support and services. IT staff stay current with emerging technologies and best practices to serve the needs of the campus community. Better outreach and communication efforts have enabled IT to gather feedback through various mechanisms, including the Merged Information Service Organization (MISO) survey, direct student surveys, and customer service feedback via the Helpdesk. In addition, IT staff members meet regularly with the Student Government Association to address student concerns, solicit feedback, and discuss future initiatives. The Academic Computing Policy Working Group, consisting of faculty and academic administrators, reviews initiatives and sets policies related to academic technology. This committee and the larger WPI IT governance structure are described in Standard 8.

Student Support

Students, along with faculty and staff, can obtain training on general and administrative software tools through the Helpdesk and ATC. ATC and the Helpdesk support students in the collaborative project work they complete outside the traditional classroom environment by providing access to and training in a wide variety of technologies, including large poster printing, multimedia presentation production, and audio and video recording and editing equipment. In addition, as the increase in online course offerings extends the reach of the WPI community, and as students increasingly demand 24/7 access to WPI information resources, IT has made significant efforts to enhance its services.

Technical Support

The Technology Helpdesk is open 85 hours per week during the academic year, providing support for all IT services across a number of platforms, including mobile devices. The Research Computing Team provides instruction and offers interactive classes focused on scientific and engineering software applications.¹³ ATC offers training sessions on multimedia tools and maintains the Learning with Technology Collaboratory website,¹⁴ which has instructions on how to create multimedia projects and use group collaboration tools.

Collaboration Tools

WPI hosts a Microsoft Exchange collaboration environment. These systems integrate with resources such as SharePoint, Blackboard project sites, and Wimba web conferencing. The university is currently increasing storage capacity to meet academic, administrative, and research computing needs; this initiative is more fully described in Standard 8.

Access

IT supports over 200 academic software applications and productivity tools in computer labs that are available 24/7 to the WPI community. These include specialized computer labs designed to meet the unique needs of such computing-intensive academic programs as Interactive Media and Game Development and Robotics Engineering. IT also provides ubiquitous remote access to WPI-hosted software and systems via terminal services, proxy servers, and a virtual private network. WPI completed an upgrade of its wireless network¹⁵ in 2010, extending coverage throughout the entire campus.

¹³ www.wpi.edu/Academics/CCC/Instruction/Sessions/sesa.html.

¹⁴ www.wpi.edu/Academics/ATC/Collaboratory/Learning/.

¹⁵ Learn more about the campus wireless network at www.wpi.edu/Academics/CCC/Netops/Wireless/.

Faculty Support

IT staff present at orientation programs offered to new WPI faculty to provide an opportunity for them to learn about IT services that address their specific needs. All faculty members who teach distance courses are assigned a Technology for Teaching and Learning (TTL) staff member who helps them maximize the online experience for WPI students. ATC staff work closely with faculty to conduct supplemental training for students in workshops and one-on-one consultations.

WPI has been using the Blackboard learning management system (myWPI) since 1999. About 80 percent of courses have a Blackboard course site. Toolsets currently integrated with Blackboard include lecture capturing technology (introduced in 2007), web-conferencing, and Web 2.0 tools such as blogs and wikis. Classroom Performance Systems (aka “clickers”) are available for faculty use in the classroom.

In conjunction with the Morgan Teaching and Learning Center,¹⁶ the ATC awards Course Design Technology Grants¹⁷ totaling \$20,000 each year. The goal of these grants is to help faculty design new instructional approaches that use technology to enhance learning, improve efficiency, and evaluate the impact of these new approaches. Faculty members frequently share the results of these grants with their colleagues at “Food for Thought” sessions sponsored by the Morgan Center.

Lecture capture technology is available to faculty members teaching undergraduate classes. Survey results show that students value the “just-in-time” access to course lectures.¹⁸ ATC staff support many innovative uses of the Echo360 lecture capture technology, including the inverted classroom model in which lectures are recorded and viewed outside of class, freeing up class time for more interactive, collaborative work.

Research Computing provides a variety of research computing support services, tools, and training. It also lends its scientific and technical expertise to research initiatives, and to support faculty, staff, and students engaged in research endeavors. The staff provides support for the procurement, installation, optimization, and management of many engineering and scientific applications. Examples include commercial applications such as Matlab, Fluent, Ansys, and Abaqus, as well as most open-source packages needed for high-performance computing. The team also supports scientific and engineering applications by offering open and customized training sessions, as well as group and one-on-one consultations.

With the addition of a staff application scientist in Research Computing in 2006, the unit is now able to provide training as well as scientific and engineering problem solving expertise. Faculty no longer use class time for software training; the application scientist provides the needed training, along with direct help to individuals and research groups. The table on the following page summarizes the growth in the program.

¹⁶ www.wpi.edu/academics/morgan.html.

¹⁷ Learn more about the grant program and see examples of the work of previous grant recipients at www.wpi.edu/Academics/ATC/Collaboratory/Programs/Design/.

¹⁸ Survey results are available at wpi.edu/Academics/ATC/Collaboratory/News/lecturecapturing.html.

Growth in Use of Research Computing Training

	No. of Training/Help Sessions and Invited Lectures			No. hours No. Attendees	attended per student
	Total	Customized	General		
Spring 2006	56	3	53	255	4.2
2006–07	97	40	57	468	3.7
2007–08	111	63	48	561	3.4
2008–09	149	92	57	736	4.2
2009–10	147	95	52	935	4.4

In collaboration with the academic deans and the Library, Research Computing has developed templates and procedures to assist faculty in developing plans to meet the new NSF data management requirements. In addition, IT and the Library are beginning to provide support and infrastructure to meet new research data management obligations that go into effect when proposals yield new NSF awards. The team is anticipating a need to review hundreds of proposals every year, and then provide an increasingly complex research project collaborative data management environment that includes federated researcher access from multiple institutions. IT is currently hiring a Research Data Scientist to develop tools to support this effort.

Professional Standards

IT staff have the opportunity to attend local, regional, and national conferences to improve their professional practice. They also frequently attend and present at conferences sponsored by organizations such as HDI, Northeast Regional Computing Program (NERCOMP), High-Performance Computing/Super Computing, BioIT, WinConnections, and SANS. In addition, Technology for Teaching and Learning (TTL) staff members participate in grants submitted by WPI faculty and present at conferences such as the Lilly Conference on College and University Teaching. The Research Computing team also participates in many grant proposals and jointly publishes papers with WPI faculty.

Information Technology: Projection

Relentless changes in technology will continue to challenge IT resources. IT cannot control these changes, but must respond by balancing data security and other risk assessments with usability and business and customer needs. These changes will require thoughtful policy development and appropriate training and education to ensure best practices and leverage future investments. For example, IT staff members are currently assessing best practices for mobile applications as the percentage of users with smartphones and tablet computers increases. The short lifespan of many new technologies requires that IT staff make wise choices to avoid costly investments in technologies that quickly become outdated.

The level of research activity in computing, and the generation of large datasets using scientific instruments, continues to increase. In 2010, WPI embarked on a multi-phase Identity and Access Management initiative. This will serve as the foundation for federated authentication with other higher education and research institutions.

In the spring of 2011, WPI completed an evaluation of its learning management system (LMS) software. When software vendor Blackboard announced a major upgrade, a sub-committee of the Academic Computing Policy Working Group consisting of faculty, staff, and IT representatives led the effort to review the new LMS options. Implementing the new system will require extensive training and direct support to faculty as they adjust to the changes. The implementation will be completed by December 2012.

Support for campus-based face-to-face classes, including those that are part of new curricula that blend on-campus and distance instruction, will continue to be important. In fact, the growth in WPI's graduate programs will provide new opportunities to creatively address the challenges brought by the adoption of blended and on-line learning and the demand for high-quality synchronous delivery systems. Additional staff from ATC and the Helpdesk have been allocated for 2011-12 to support the growing need of faculty and students to access and interact with WPI courses and course websites during evenings and weekends.

**Standard 7: Library and Other Information Resources
(Library)**

					3 years prior	2 years prior	Most recently completed year	Current year (actual or projection)	Next year (goal)
					(FY 2008)	(FY 2009)	(FY 2010)	(FY 2011)	(FY 2012)
Expenditures/FTE student									
	Materials				\$397	\$392	\$377	\$400	\$404
	Salaries & Wages				\$312	\$338	\$284	\$313	\$304
	Other operating				\$63	\$38	\$35	\$44	\$43
Collections									
	Total print volumes				271615	274805	273606	273000	273000
	Electronic books				46,821	65,875	92,571	100,000	125,000
	Print/microform serial subscriptions				303	205	200	200	200
	Full text electronic journals				34,741	44,903	68,952	73,501	74,000
	Microforms				112,960	112,960	112,960	112,960	112,960
	Total media materials				1,941	1,933	2,657	3,000	3,000
Personnel (FTE)									
	Librarians -- main campus				12.7	12.7	10.7	11.7	12.0
	Librarians -- branch campuses				n/a	n/a	n/a	n/a	n/a
	Other library personnel -- main campus				19.2	19.2	18.2	19.4	20.0
	Other library personnel -- branch campus				n/a	n/a	n/a	n/a	n/a
Library Instruction									
	Total sessions -- main campus				231	312	277	322	335
	Total attendance - main campus				2,767	3,652	3,498	3,692	4,025
	Total sessions -- branch campuses				n/a	n/a	n/a	n/a	n/a
	Total attendance -- branch campuses				n/a	n/a	n/a	n/a	n/a
Reference and Reserves									
	In-person reference questions				3,458	2,986	3,388	3,788	4,188
	Virtual reference questions				789	720	849	969	1,089
	Traditional Reserves:								
		courses supported			289	378	455	490	500
		items on reserve			1,302	1,559	1,820	2,000	2,100
	E-Reserves:								
		courses supported			n/a	n/a	n/a	n/a	n/a
		items on e-reserve			n/a	n/a	n/a	n/a	n/a
Circulation (do not include reserves)									
	Total/FTE student				14	14	13	14	14
	Total full-text article requests				230	240	245	250	230
	Number of hits to library website				801,457	1,039,011	1,116,990	1,172,840	1,231,481
	Student borrowing through consortia or contracts				2,596	2,128	2,144	2,641	2,800
Availability/attendance									
	Hours of operation/week main campus				103	103	106	103	106
	Hours of operation/week branch campuses				n/a	n/a	n/a	n/a	n/a
	Gate counts/year -- main campus				250,995	296,228	334,901	360,000	370,000
	Gate counts/year -- average branch campuses				n/a	n/a	n/a	n/a	n/a
URL of most recent library annual report:					http://www.wpi.edu/Academics/Library/About/AnnualReport				
URL of Information Literacy Reports:					http://www.wpi.edu/Academics/Library/Faculty/ilvision.pdf				

Standard 7: Library and Other Information Resources									
Information Technology									
					3 years prior	2 years prior	Last year	Current year (goal or projection)	Next year goal
					(FY 2008)	(FY 2009)	(FY 2010)	(FY 2011)	(FY 2012)
Number (percent) of students with own computers					100	100	100	100	100
Course management system				Blackboard 8.0.475					
Number of classes using the system									
Classes on the main campus				1088	1242	1301	1363	1410	
Classes offered off-campus				37	68	92	119	140	
Distance education courses				66	60	85	102	110	
Bandwidth									
On-campus network*				30 Gbps	30 Gbps	40 Gbps	40 Gbps	40 Gbps	
Off-campus access									
commodity internet (Mbps)				80 Mbps	560 Mbps	560 Mbps	560 Mbps	560 Mbps	
high-performance networks (Mbps)				1 Gbps	1 Gbps	1 Gbps	1 Gbps	1 Gbps	
Wireless protocol(s)				802.11 abg	802.11 abg	802.11 abgn	802.11 abgn	802.11 abgn	
Network									
Percent of residence halls connected to network									
wired				100%	100%	100%	100%	100%	
wireless				60%	80%	100%	100%	100%	
Percent of classrooms connected to network									
wired				100%	100%	100%	100%	100%	
wireless				100%	100%	100%	100%	100%	
Public wireless ports				100%	100%	100%	100%	100%	
Multimedia classrooms (percent)									
Main campus				77%	80%	87%	90%	92%	
Branches and locations				N/A	N/A	N/A	N/A	N/A	
IT Personnel (FTE)									
Main campus				56.0	56.0	58.0	58.0	60.0	
Branch campuses				N/A	N/A	N/A	N/A	N/A	
Dedicated to distance learning				2.0	2.0	2.0	2.0	2.0	
Software systems and versions									
Students				Banner 8.4.1					
Finances				Banner 8.4					
Human Resources				Banner 8.4.1					
Advancement				Banner 8.3.2					
Library				Voyager 7.2.1					
website management				Open Text; Red Dot CMS v7.5 and v10					
portfolio management				N/A					
interactive video conferencing				Wimba and Tandberg					
digital object management				Cumulus and Digitool 3.3, Service Pack 00					
* calculated based on: Total Aggregate Network Backbone Bandwidth (total up all links between Fuller Labs & Power House core routers * bandwidth of each link): 4 * 10 Gigabits/sec = 40 Gigabits/sec									

Standard Eight: Physical and Technological Resources

Introduction

The response from the New England Association of Schools and Colleges regarding WPI's fifth-year interim report recommended that the Fall 2011 Self-Study give particular focus to the success of the Gateway Park project, and WPI's plans for new and renovated residence halls and library facilities, and that generally special emphasis be given to this standard.

Physical Resources: Description and Appraisal

WPI's main campus is situated on approximately 80 acres of land bordering the professional residential neighborhoods of Worcester. The main campus has 38 major buildings and 36 peripheral properties encompassing approximately 1.6 million gross square feet of space. The peripheral properties, adjacent to the main campus, are used primarily for graduate student housing, student services, and administrative offices.

The university also owns an additional 12 acres of land located a quarter mile from the main campus, designated as Gateway Park. This master-planned park envisions five buildings totaling approximately 500,000 gross square feet of flexible laboratory and office space for a range of research and commercial activities. Gateway Park has a 660-space parking garage and more than 200 surface parking spaces to accommodate the needs of further development. The flagship building at Gateway Park is WPI's 125,000-square-foot Life Sciences and Bioengineering Center (LSBC), which opened in 2007. Further signifying its commitment to the development of the Gateway Park neighborhood, WPI leases space in an adjacent building to support its development offices, the School of Business, Corporate and Professional Education Division, Massachusetts Academy of Math and Science, and a grounds storage facility. These Gateway Park locations comprise approximately 293,000 gross square feet. In total, WPI operates approximately 1.9M gross square feet.

WPI also owns, and operates through a separate real estate management firm, the 108-unit apartment complex Salisbury Estates, situated within walking distance of the campus. Beginning in 2009, certain units at Salisbury Estates have been used for undergraduate student housing to accommodate WPI's enrollment growth strategy. These units are managed under the auspices of Residential Services.

Since President Berkey's arrival in 2004, WPI has made significant progress in better understanding and strengthening its physical and technological resources, deploying each in a highly effective and efficient manner that supports the university's mission and its strategic planning goals and objectives.

Goal 5 of the revised WPI Strategic Plan¹ is to "develop campus facilities according to an explicit plan for supporting academic and co-curricular needs and property maintenance." In order to accomplish this goal by WPI's sesquicentennial in 2015, a seven-year Major Capital Plan² was adopted by the Board of Trustees in May 2008. The Major Capital Plan articulates approximately \$140 million in high-priority capital projects and potential funding sources. Funding sources include campaign achievement, use of debt (issued in January 2010), and use of operating surplus as generated. It is estimated that through June 30, 2012, approximately \$79 million of funded projects will be completed. The successful achievement of the Campaign for WPI will be necessary for full implementation of the plan.³ The plan is a guide and roadmap for capital planning and budgetary purposes. In addition to defining new strategic capital initiatives, the plan incorporates existing deferred maintenance considerations. The capital plan was developed with full input by the Board of Trustees and various senior administrators representing the many stakeholders of WPI. The plan was revised in May 2011. In addition to the Major Capital Plan, an Academic Space Planning Committee has met to advise on

1 Available in the Workroom and at www.wpi.edu/offices/president/strategic-plan.html.

2 Available in the Workroom.

3 Refer to Standard Nine for additional information on the Campaign for WPI.

tactical needs and to inform the ongoing review and updates of the Major Capital Plan. The annual budget development cycle includes an opportunity for all academic and administrative departments to request specific capital projects and equipment needed in their respective areas. To ensure that all community member needs are being considered for capital planning purposes, the administration hosts an annual student town meeting where students and the administration discuss a variety of topics, including capital and facility plans, and where feedback is exchanged. Finally, the planning of major capital projects is informed, in part, by the Campus Master Plan⁴ (revised April 2004) and the Recreational Facilities Master Plan⁵ (dated February 2005). Discussions are currently taking place in the Board of Trustees' Facilities and Campus Infrastructure Committee to update the Campus Master Plan during fiscal year 2013.

Academic Facilities Development

A significant revitalization of the WPI campus essentially began in 2007 with the completion of the LSBC at Gateway Park, a \$39.1 million, 125,000-square-foot facility that is fully occupied with graduate research laboratories, faculty offices, state-of-the-art core facilities, and WPI's Corporate and Professional Education Division. In addition, several life science companies and a life sciences incubator are tenants in the building. The opening of the LSBC enabled needed space to become available on the main campus as many faculty and existing older laboratories resident in Salisbury Laboratories and Goddard Hall were moved into the new facility.

Comprehensive plans for the adaptive reuses of the vacated spaces in Goddard Hall and Salisbury Laboratories have been put in place. Made possible by an \$11.5 million campaign gift, the 21,300-square-foot George I. Alden Life Sciences and Bioengineering Education Center opened in 2009 within Goddard Hall. Specifically, the center houses state-of-the-art undergraduate teaching laboratories for biology, biotechnology, biomedical engineering, chemistry, and biochemistry. In addition, the center features shared computer space, a classroom, instrumentation, and a variety of areas for project meetings and informal interaction among students and faculty, a design philosophy consistent with that of the LSBC.

The adaptive reuse of Salisbury Laboratories is approximately 75 percent complete. Given that the original construction of the building lent itself well to accommodate WPI's need for additional faculty offices and classroom spaces, a floor-by-floor renovation of the building for these purposes is taking place. Numerous science laboratories were carefully decommissioned as the building has transitioned to traditional classroom and office use. Thus far, five new classrooms, two computer labs, a Fire Protection Engineering lab, and 26 faculty offices have been added; two additional classrooms have been renovated as well as three faculty offices. A new restroom was added and another was renovated. Since 2008 approximately \$3.8 million has been reinvested in Salisbury Laboratories.

WPI's faculty office, classroom, and laboratory space needs are continually being considered and addressed. In 2005 the university engaged Ira Fink and Associates to conduct a space planning and utilization study to better inform these planning efforts. Given the significant changes in the built environment since that time, the information generated from that study is outdated and is not currently used for planning purposes. While adequate classroom, office, and research space is available today, an updated space planning and utilization study will aid in determining future needs commensurate with WPI's growth strategies. Since 2001, the number of classrooms has been increased from 34 to 41, commensurate with the growth in enrollment.

While available space is an ongoing challenge on the main campus, Gateway Park is again providing opportunities for strategic investments in WPI's growth. The second building at Gateway Park is being developed by a private developer, O'Connell Development Group of Holyoke, Massachusetts. WPI has ground leased one of the park's four remaining pad-ready sites to O'Connell to finance, own, construct, and operate a four-story, approximately 92,000-square-foot building for a range of academic, life sciences,

⁴ Available in the Workroom.

⁵ Available in the Workroom.

and other corporate uses. WPI will be a tenant in this building for three university programs: the new Biomanufacturing Education and Training Center (BETC) within the Corporate and Professional Education Division, an expanded Fire Protection Engineering Department and research laboratory (FPE), and the graduate division of WPI's recently established School of Business. The building is being designed to achieve LEED certification. Substantial completion is anticipated in early fall 2012. WPI received a \$2.95 million grant from the Massachusetts Life Sciences Center to fund the fit out of the BETC space. The FPE and School of Business spaces are being fit out by WPI at a cost of approximately \$3.2 million.

The Gordon Library building underwent renovations to develop an information commons over a two-year period (2008-2010) at a cost of approximately \$1.2 million with the goal of leveraging the combined resources of the Library and Information Technology to provide greater access to technology tools and services to students centrally in the Library. The Library building now houses two Information Technology units: the Technology Helpdesk and the Technology for Teaching and Learning Group of the Academic Technology Center, and all operations and collections of the library. In the past 10 years, the library added eight collaborative spaces installed with specialized computer equipment. As part of its ongoing commitment to address the most pressing deferred maintenance items, recent updates to the Gordon Library include the replacement of the roof, caulking of all exterior windows, replacement of fluorescent bulbs to increase energy efficiency, and installation of portable dehumidifying equipment in the Archives and Special Collections.⁶

The next major step in academic facilities development calls for the adaptive reuse of Alumni Gym, when the Sports and Recreation Center (see below) is completed. This project is in the conceptual planning phase. The initial concept under consideration is to create an innovation center highlighting the WPI project-based approach to undergraduate education. Faculty offices, classrooms, and large open project spaces are envisioned. This project is included within the Major Capital Plan.

Residential Facilities Development

As noted in the August 2006 Fifth-Year Report, continuing to strengthen WPI as a residential campus is a high priority and has received significant investments. To this end, the first phase of the Recreational Facilities Master Plan was put into effect beginning in 2006 with the \$2.8 million renovation of Alumni Field. With the existing facility having reached the end of its useful life, new synthetic turf, spectator seating, press box, lighting, and scoreboard were put in place to create the new Alumni Stadium. A next phase of the plan, and the largest project to be constructed at WPI, is the new \$53.2M, 145,000-square-foot Sports and Recreation Center, to be substantially complete by May 2012. The capacity and functionality of the existing Alumni Gym (opened in 1916) have been outgrown by the WPI community. This new facility will replace the core fitness and recreational facilities of Alumni Gym (e.g., competition-sized swimming pool, four-court 29,000-square-foot gymnasium, three-lane jogging track, 14,000-square-foot fitness center, and well-equipped locker rooms) and add much needed multipurpose, training, and office space for the Physical Education, Recreation and Athletics Department. The facility will also have a pit area for robot preparation, allowing larger robotics competitions to be held in Harrington Auditorium.

Another significant component of strengthening WPI as a residential campus is the improvement of the residential facilities to house more undergraduate students. WPI took a major step forward in fall 2008 with the opening of its first new residence facility in 23 years. This \$41.9 million facility brings upperclass students back to the WPI campus, while providing additional residential space to support the undergraduate growth strategy. East Hall is a 232-student, approximately 104,000-square-foot apartment-style residence hall featuring four-person apartments with full kitchens, living rooms, compartmentalized bathrooms, and either single or double bedrooms. Recreation and fitness spaces are part of the program, as are "tech suites" on each floor to accommodate student project work. An adjacent 189-space parking garage was also constructed to support this facility and the lower WPI campus. The building received LEED Gold level of certification by

⁶ See Standard Seven for additional description of the library renovations.

the U.S. Green Building Council. The program for the residence hall and parking facility is compatible with WPI's mission to foster innovation and creativity and further demonstrates WPI commitment to sustainable development. The building is capped with the first "living" green roof in the City of Worcester, which additionally functions as a civil engineering research site for studying issues of storm water. The development of the Boynton Street site also provided new energy and renewal to the lower campus, which already included residential and Greek housing.

WPI is currently evaluating next steps to continue to increase undergraduate and graduate student housing capacity. Options include construction of a new apartment-style residence facility for both undergraduate and graduate students on the 75 Grove Street site at Gateway Park. A second option under consideration is to renovate Salisbury Estates to become permanent undergraduate and graduate student housing. Additional housing capacity is a project included in the Major Capital Plan.

The third phase of the Recreational Facilities Master Plan, a new parking garage and playing field project, is in the preliminary planning and design stages. The concept under development includes the creating of ground-level parking for approximately 600 cars and team buses with a campus entrance off Salisbury Street, and a second multipurpose synthetic playing field (to accommodate soccer, lacrosse, field hockey, and softball) on top of the parking structure. The project will also feature pedestrian paths and landscaping to connect Alumni Stadium, Harrington Auditorium, and the Campus Center. The development of this facility will provide for adequate campus parking and allow the quadrangle to become free of vehicles—each of which has been a goal of the Institute for some time. This project is included in the Major Capital Plan.

Other Campus Development

In 2006 WPI opened the \$7 million, 17,000-square-foot Bartlett Center, located at the east end of an expanded WPI quadrangle. The Bartlett Center is the significantly improved home to WPI's Office of Admissions and Office of Financial Aid. The building serves as a welcome center for campus visitors, particularly thousands of prospective students and their families. The Bartlett Center was the first WPI building to be registered with the U.S. Green Building Council as LEED certified. The building provides the necessary space to support WPI's undergraduate enrollment strategy and has played a key role in helping facilitate the growth in the undergraduate student body over the past several years.

Facilities Operations

Proper management, maintenance, and operation of all WPI facilities reside within the Department of Facilities. The current annual operating budget for Facilities is approximately \$7.5 million (excluding utilities), and the current staff numbers 87. The organization includes the Assistant Vice President for Facilities and his direct reports: Director of Project Management and Engineering, Manager of Environmental and Occupational Health and Safety, Facilities Systems Manager, and Director of Facilities Operations (who oversees the management of buildings and events), the manager of grounds and properties, the supervisor of mechanical operations, and the chief power plant engineer. In addition, there are three custodial supervisors. Hourly personnel include four powerhouse operators, 44 custodians, 14 technical trades, nine groundskeepers, and three administrative support staff. The Assistant Vice President for Facilities reports to the Executive Vice President and Chief Financial Officer.

Building Services (custodial) is responsible for the cleaning of campus buildings, recycling, and setup and support of campus special events. Over the past several years, custodial supervisors have been asked to assume more visible roles within their facilities while efforts to raise accountability for building cleanliness and to improve customer service and satisfaction have been infused into the daily roles of the supervisors. Management is putting in place better feedback mechanisms to help gauge whether these initiatives are improving customer satisfaction throughout the campus. A recent workload analysis of custodians by building has allowed for more effective use of resources to areas that are in need of additional cleaning or support.

Grounds Services maintains all campus grounds, athletic fields, and the peripheral properties. It is responsible for maintaining flowerbeds, mowing, pruning, leaf removal, fertilizing, snow removal, and vehicles, as well as providing periodic moving services.

Technical Trades, with subcontractor support in such specialty areas as elevators, alarms, and controls, is responsible for building technical maintenance, including electrical, plumbing, carpentry, HVAC, locks, and painting, along with the power plant. The IBM Maximo work-order system is used to facilitate the management of projects and to schedule and expedite community requests for work to be performed. This past year, specific attention has been given to improving the effectiveness of the Maximo system. Automated response functionality has been implemented to better communicate with the customer that a work order has been received. Continued improvements to the Maximo system are to be made over the next 12 months.

Environmental and Occupational Health and Safety has a full-time manager focused on developing, overseeing, and (with respect to the physical plant) implementing compliant environmental programs throughout the main campus and at Gateway Park. Such activities include safety and compliance issues in campus facilities and laboratories, including hazardous material handling, lab safety training, Campus Safety Committee activities, fire safety, and related issues. The Manager is supported by three staff members from the science departments whose part-time responsibilities include Biosafety, Radiation Safety, and Laser Safety activities. This spring, WPI engaged Woodard & Curran as an independent third party auditor to perform an environmental compliance audit of the main campus and the LSBC. The audit was conducted, in part, to provide WPI with an understanding of the laws that apply to its operations and facilities; develop and implement corrective action plans designed to gain short- and long-term compliance, evaluate the effectiveness of current compliance management systems, and heighten the overall awareness of environmental compliance issues. While the results overall were very favorable, the audit identified several areas where additional focus is needed. WPI is in the process of addressing these issues.

The Director of Project Management and Engineering works with the support of other facility managers to plan and implement numerous general capital projects throughout the campus. An outside contractor provides owner's rep/project management services for larger projects.

In 2009 Facilities took a lead role in campus-wide facility-related sustainability and reporting efforts, and as such dedicated approximately 50 percent of the Facilities Systems Manager to support these tasks and to staff the President's Task Force on Sustainability.⁷ WPI is in the process of developing a holistic Campus Sustainability Plan that will include specific facilities and academic related goals and objectives. Future planning will consider the need to hire a full-time Sustainability Coordinator, allowing the return of the Facilities Systems Manager to full-time systems support.

An external company, Sightlines, conducted a Return on Physical Assets study in 2007 and 2008. A component of the study looked at operational effectiveness, such as staffing and supervision, maintenance materials, and service profile. The results of this study indicated that Facilities staffing levels and supervision per FTE were generally lean compared to peer institutions. However, Sightlines noted that WPI's service profile was consistent with peers. Since that study, WPI has strengthened the management of Facilities with the addition of two new positions: Director of Facilities Operations, and Supervisor of Mechanical Operations. Also, with the retirements of two longtime senior employees in Facilities, a new Assistant Vice President was recruited in 2007 and a new Grounds Manager was hired in 2011. Each brings solid expertise and new vision to the department.

As noted in the 2001 Self-Study, addressing deferred maintenance is a constant challenge on most university campuses and remains in continual focus at WPI. To make a significant impact on the most pressing deferred maintenance needs at the time, in 2003 WPI issued \$15 million (net proceeds of approximately \$14.4

⁷ A description of this task force is at www.wpi.edu/about/sustainability/taskforce.html.

million) of revenue bonds to address significant deferred maintenance items, as noted in detail in the August 2006 Fifth-Year Interim Report to NEASC.

A significant component of the Sightlines study focused on WPI's annual stewardship and asset reinvestment trends and needs. The study indicated that WPI provided limited funding for reinvestment in its facilities. Since that study, WPI has significantly increased its funding of deferred maintenance, averaging approximately \$7.4 million per year.

However, to gain a more detailed understanding of the deferred maintenance needs on the campus and to develop a plan to adequately address this prospectively, Strategic Building Solutions was engaged in 2010 to develop a Facilities Condition Assessment Plan (FCAP). Its analysis included an architectural, electrical, site and code evaluation of the major buildings on campus. Observations concluded that WPI facilities and grounds are well maintained, many major buildings have received significant cosmetic upgrades, residence halls are in good condition aesthetically but some have older mechanical systems and the infrastructure in many buildings is in need of significant investment. Approximately 67 percent of the gross square footage on campus is over 25 years old (construction age).

FCAP will inform the development of future capital plans and budgets (this started with the FY 2012 capital budget) with respect to addressing the highest priority deferred maintenance on the campus. Working closely with the Board of Trustees Budget and Finance and Facilities and Campus Infrastructure committees, a plan is being developed to determine an appropriate target level of deferred maintenance (based on WPI standards and industry best practices), along with a budgetary strategy to meet the target over a reasonable period of time. The study indicated a total deferred maintenance backlog of approximately \$63.4 million. When reviewed in comparison to industry standards provided by Strategic Building Solutions, WPI's overall backlog is slightly higher than average. However, for items noted as high priority, WPI's backlog was slightly less than average. A presentation of the results of FCAP was made to the Facilities and Campus Infrastructure Committee at its May 2011 meeting.

University facilities are constructed in accordance with all local, state, and federal requirements applicable at the time of construction. The university is continuing to add card access to buildings across the campus (approximately one new building per year) and many have automatic door openers to aid with accessibility. There remain several older buildings on campus without elevators (Alumni Gym, Stoddard Residence Halls, Stratton and Kaven Halls, and the Project Center). A ground-level computer classroom has been built in Stratton Hall to help with accessibility in that building. The above-noted planning for the adaptive reuse of Alumni Gym will address accessibility in that facility.

Campus safety remains an important consideration and resources are regularly provided to ensure its adequacy. The campus has a blue light emergency telephone system and employs video cameras in selective locations. All university buildings have appropriate smoke detection systems, and most have fire suppression systems, including all residence halls.

Facilities: Projection

Significant investment in WPI's academic, residential, and support facilities has occurred since the last self-evaluation, with most of it taking place since the arrival of President Berkey in 2004. The campus has sufficient and appropriate physical resources that are well-managed, maintained, and operated for the achievement of its purpose. Growth in the student body and faculty has been accommodated through thoughtful reuse of existing on-campus space and new facilities development at Gateway Park. Facilities effectiveness will continue to be monitored as demand for services are increasing with greater campus density and usage, and as square footage is being added. The continued successful implementation of the seven-year Major Capital Plan, which includes the adaptive reuse of Alumni Gym, an additional residence facility, a new parking garage and playing fields, and consideration of deferred maintenance in accordance with a strategy

to be developed to address the FCAP, will ensure that the strategic planning goals and objectives relating to physical resources will be fully achieved and realized. With the many changes that have and will be taking place on the campus, revising the Campus Master Plan and updating the space planning and utilization study will provide more fulsome information for future planning purposes.

Technological Resources

The Information Technology (IT) Department provides a wide variety of systems and services to support the academic mission of the university. The CIO oversees an annual IT capital budget of approximately \$1.8 million to fund technology initiatives and core infrastructure for the entire university. WPI instituted an IT capital budget process in 2000, which provides a comprehensive approach to identifying, prioritizing, and funding strategic technology related initiatives and infrastructure. Through this process, all academic departments on campus may submit requests prioritized with the input of the CIO, appropriate division head, the Provost, and the Executive Vice President, and CFO. The annual IT capital funding enables the university to have effective replacement cycles for employee computers, computer labs and electronic classrooms, servers, network equipment, and other core infrastructure.

The IT department, which employs 58 professional and administrative staff, consists of five units: Hosting and Support Services, Network Operations and Information Security, Enterprise Solutions/Information Systems, Research Computing, and the Academic Technology Center (ATC). An additional 79 students (approximately 16 full-time equivalents) assist IT staff with providing support services. The IT units of Research Computing and the ATC are described in Standard Seven as they relate to direct support of the academic program.

The **Enterprise Solutions** team provides the technical support for the implementation and integration of WPI's enterprise information system (the Banner System) purchased in 1988. The student module was the first application implemented. The other application modules including Banner Finance, Human Resources, Financial Aid, and Advancement were rolled out in the 1990s.

In response to community concerns that the Banner system was not providing timely and accurate information and that requests for IT projects were not being adequately addressed, WPI senior leadership engaged SunGard to conduct a Banner renewal project beginning in 2007. As early adopters of an integrated information system, the implementation of Banner was largely technically driven. The development of rules, values, data mapping documentation and data migration plans involved limited input from the business units. Realizing the need for a change in how Banner, as well as other IT solutions on campus, is utilized and managed, WPI leadership recognized the importance of business units taking greater ownership of data and processes, and becoming partners with Information Technology in providing IT solutions. To aid in providing consistent institutional data, SunGard's Operational Data Store was subsequently purchased and implemented and the Argos reporting tool became a primary resource, in addition to the Oracle Discoverer reporting tool. The Banner renewal project, which included a significant amount of data clean up, is ongoing.

As part of the Banner renewal effort, in 2007 and 2008 WPI implemented an IT governance structure and hired Information Analysts (IAs) to support each major university business unit. The mission and goal of the IT Enterprise Solutions team is to partner with the IAs and their business units to continue to improve WPI business processes and to identify areas for optimization and improvement of the use of data and the information system to support business unit and overall Strategic Plan goals.

The **IT Governance team**, under the leadership of the Executive Vice President and CFO, evaluates and prioritizes proposed IT initiatives to best meet the strategic objectives of the university. Four subgroups of IT Governance address the detailed project planning and the development of data standards and access: Academic Computing Policy Working Group, Administrative Systems Working Group, Data Stewards Working Group, and Data Access Working Group. This governance structure, referred to as the

Unified Digital Campus (UDC), has been effective at allocating WPI's IT resources to the academic and administrative projects that best support the university's mission.

Over the last 10 years, many third-party software solutions have been implemented to complement the Banner system, and many system interfaces between Banner and third-party software have been developed and are maintained by the Enterprise Solutions team.⁸

The **IT Hosting and Support Services** team is responsible for providing stable and secure platforms for hosting software applications and services on campus, and for evaluating and integrating third party software hosted off-site by application service providers. This team manages core-computing services for office automation, classroom automation, computer laboratories, email infrastructure, identity management, database administration, data storage, data backup, and off-site secure storage, and maintains a system for monitoring and alerting of system or service interruptions to IT staff mobile devices. This team also includes the Technology Helpdesk, which provides technology support with administrative and academic software and systems to members of the community electronically, via phone, and in-person.⁹

WPI maintains three secure, climate-controlled computer rooms that house the university's computing and network infrastructure, with an additional off-site disaster recovery site. IT engineers build and maintain all on-premises systems, and manage third-party systems and relationships as necessary.

The **WPI Network Operations, Information Security and Telecommunications** team designs, installs, manages, and maintains the internal and external communications infrastructure for the university. The Network Operations staff is responsible for the network backbone, server room infrastructure and connectivity to all WPI buildings, all internal and external fiber and copper communications infrastructure, commercial Internet and Internet2 connectivity, including management of the Goddard GigaPop that provides an educational presence for Worcester area colleges and Massachusetts K-12 schools. The Telecommunications team provides management of WPI's PBX as well as architecture, installation, and management of the card access control and video surveillance systems. The Information Security team works closely with departments throughout the university to develop and enforce policies and procedures to govern the acceptable use of data and network resources. These policies include the WPI Acceptable Use Policy, Network Security Policy, Data Security Policy, Data Outsourcing, and WPI Copyright Compliance.¹⁰

Technology: Assessment

WPI's primary network and telecomm equipment supplier of many years, Nortel Networks, declared bankruptcy in 2009, and was acquired by Avaya. Due to the lack of a solid migration path for the WPI network backbone, the Network Operations team began a 10-month evaluation of next-generation network technologies and architectures to support WPI's future teaching and research efforts. Cisco Systems and Juniper Networks were the top competitors able to supply next-generation network technologies to support WPI's future research and computing needs. Both companies' networking equipment and designs were vetted and validated by the WPI Network Operations Team, the Gartner Group, and Protocol Networks, with Juniper Networks being selected. As a result, the WPI network was redesigned in 2010, and WPI made significant investments in Juniper hardware to implement the new 10GB campus backbone structure to support current and future campus operations.

The main WPI campus buildings are connected via an extensive fiber plant that terminates in two redundant data centers. The data centers were recently upgraded to house a pair of Juniper MX960 high-capacity routers in a redundant configuration. Each router has a maximum throughput of 2.6 Tbps and offers a mix of 1

8 The ES Integration diagram is available in the Workroom.

9 Statistics on the number and types of systems are available in the Workroom.

10 These policies are available online at www.wpi.edu/offices/policies/ and www.wpi.edu/Academics/ccp/Policies/.

and 10 Gbps connections for building uplinks. Interface cards, routing engines, and switching fabrics are all modular and redundant, allowing for in-place upgrades to higher capacities as technology becomes available. The data center's top-of-rack network solutions have also been upgraded to Juniper 4500 and 4200 switches, providing 10 Gbps connections to servers and ability to support both high-performance computing and large-scale network-attached storage for research computing.

Building location connectivity is provided by Avaya 8300, Juniper EX4200, or EX4500 switches providing multiple 1 Gbps or 10 Gbps uplinks to the network core. All buildings have one or more direct connections to both MX960 routers, offering between 4 and 40 Gbps of bandwidth per building. WPI is evaluating the replacement of the remaining Avaya/Nortel switches with Juniper technologies.

Remote WPI locations are connected via dual links in a ring configuration over leased dark fiber, giving them redundant network connectivity to the WPI core. WPI provides ubiquitous wireless coverage in all academic and administrative buildings, common areas, and residence halls, as well as secure VPN access for offsite connections to WPI resources.

The Network Operations team is also responsible for the communications infrastructure development and architecture for new and renovated building initiatives. Currently the team is designing the upgrade to a 10 Gbps optical ring to support the Gateway Park expansion, as well as the internal design and implementation of networking, telecommunications, cable TV, card access, and video surveillance for WPI's new Sports and Recreation Center and Gateway Park II buildings.

The increasing number of third-party solutions (requested by the University's various business units) and integration into WPI's already complex computing infrastructure has become a substantial challenge. The IT Information Security team has developed a vendor analysis template to assist IT and the business units with assessing vendor ability to execute and comply with the many laws and regulations regarding private, protected data hosted off-site on behalf of WPI. Together with the Associate Director of IT Support Services, the Information Security Officer will also lead a team to evaluate impacts this trend will have on IT support services and escalation for problem resolution both within IT and with the multiple vendors of Internet Hosted applications.

The Information Security team also works closely with internal WPI offices and external law enforcement policing entities. It works with the Dean of Students in the development and enforcement of the WPI Information Security Policy, and with the University Compliance Officer to ensure compliance with state and federal laws and to develop training to educate and inform the WPI community. The team also performs outreach initiatives and information security education for the community through NightLife training programs. The team maintains close relationships with various law enforcement agencies.

With the retirement of the WPI Telecommunications Manager in March 2011, WPI restructured the position and responsibilities to incorporate management of the card access system as well as the PBX. The new Manager of Telecommunications is in the process of developing a telecommunications road map that will incorporate the upgrade and maintenance of the main campus Avaya 81C PBX and Gateway Park and 85 Prescott Street CS1000 IP phones systems, as well as WPI's Call Center software. The Telecommunications team, working with the Hosting Services Team, will lead the evaluation, testing, selection, and implementation of Unified Messaging and automated attendant technologies.

Over the past 10 years, WPI developed a strategy to support research computing through investments in dedicated IT personnel, and state of the art hardware and software, and to provide appropriate capital funding. The continually growing WPI research computing capacity exceeds six teraflops, with storage capacity well over 150 terabytes.

WPI Research Support Team provides and manages central and academic department/faculty-owned high-performance compute clusters, symmetric multiprocessing systems, and enterprise-level storage. The team also provides automated backup solutions for servers, workstations, and PCs attached to scientific instruments.

High-performance storage is available through the usage of specialized storage arrays for all computing needs, including Storage Array Network connections for high throughput and Network Attached Storage connections for acquiring and managing extremely large data sets.

The WPI administrative and academic computing infrastructure supports a number of client operating systems and form factors (including Windows, Macintosh, Linux, UNIX, tablets, smartphones, etc.) via the robust server environment. WPI continues to invest in virtualization technologies to provide ease of management and high value while keeping costs low, and allowing rapid deployment of new services. Virtualization is also used for desktop computers, which allows simplified access to a large variety of software and services with little disruption to the end user. WPI provides 210 academic software applications for student and faculty classroom and independent use. Access to software is provided through physical computer laboratories throughout the campus and via remote access.

IT staff maintain the computer and audio-visual equipment in the classrooms, group study rooms, and conference rooms on campus. The classroom AV podium houses a standard collection of equipment to facilitate ease of use when instructors and students move from room to room. A four-to-five-year replacement cycle is maintained to ensure the reliability of the equipment. Faculty input is sought on changes to the AV equipment design as new technologies emerge and new pedagogical needs arise. Today, 92 percent of WPI classrooms are multimedia-enabled. There are also 22 technology-enabled collaboration suites available to support student work in the residence halls and the library, and nine 24/7 accessible computer labs with a three-year computer replacement cycle.

Technology: Projections

Like most higher education institutions, WPI is facing an explosion of data generated and used for both academic and administrative purposes. Recent National Science Foundation and National Institutes of Health guidelines for the management of research data have further driven requirements for long-term storage and accessibility. In response, WPI IT performed a storage assessment and developed a scalable storage strategy. It recently invested in an additional 200TB scalable network attached storage that was implemented in the summer of 2011. WPI IT will continue to monitor and expand storage as the demand increases. WPI expects to invest in tools that will enable Internet-accessible storage solutions to facilitate collaboration among faculty and student researchers from multiple institutions.

With the shift to an increasingly Internet-hosted environment for software solutions, there is an anticipated shift of workload away from on-site system and application administration, toward analysis, monitoring, and managing vendor capability and services.

In addition, higher education is moving toward ubiquitous mobile computing, with increasing use of mobile and tablet devices by faculty, staff, and students. This shift has increased the use of mobile/web-enabled software applications integrated with existing systems and services, and is driving an increased demand for wireless networking capacity.

A continued challenge will be for WPI's IT resources to adapt its service model to accommodate the rapidly changing technology environment. IT must adapt to growth in ubiquitous and cloud computing, and to respond by balancing data security and other risk assessments with usability, business, and customer needs. These challenges must be met with thoughtful policy development, proper resource allocation, and appropriate training and education to help the WPI community take advantage of new technologies.

Standard 8: Physical and Technological Resources									
Campus location				Serviceable Buildings		Assignable Square feet (000)			
	main campus			79		1,072			
	other U.S. locations			5		315			
	international locations			NA		NA			
					2 years prior	1 year prior	Current Year	Next Year Goal	Goal in 2 years
					FY2009	FY2010	FY2011	FY2012	FY2013
Revenue (\$000)									
	Capital appropriations (public institutions)				NA	NA	NA	NA	NA
	Operating budget				\$6,417	\$9,099	\$7,950	\$9,880	\$20,431
	Gifts and grants				\$6,725	\$1,000	\$0	\$2,950	\$5,084
	Debt				\$1,113	\$3,709	\$24,707	\$28,562	\$4,285
	University Reserves				\$5,798	\$3,654	\$2,474	\$3,400	\$2,000
	TOTAL				\$20,053	\$17,462	\$35,131	\$44,792	\$31,800
Expenditures (\$000)									
	New Construction				\$4,692	\$3,663	\$23,000	\$31,612	\$18,000
	Renovations, maintenance and equipment				\$12,832	\$11,604	\$10,385	\$10,900	\$11,800
	Technology				\$2,529	\$2,195	\$1,746	\$2,280	\$2,000
	TOTAL				\$20,053	\$17,462	\$35,131	\$44,792	\$31,800
Assignable square feet (000)			Main campus			Off-campus		Total	
	Classroom			352		90		442	
	Laboratory			incl above		incl above		incl above	
	Office			13		3		16	
	Study			53		0		53	
	Special			159		0		159	
	General			35		5		40	
	Support			71		105		176	
	Residential			408		94		502	
	Other							0	
		TOTAL		1,091		297		1,388	
Major new buildings, past 10 years									
	Building name		Purposes		Assignable Square Feet (000)		Cost (000)	Year	
	Bartlett Center		Admissions - General Purpose			11	\$ 7,000	2006	
	Gateway LSBC		Graduate Life Sciences - Academic			87	\$ 39,100	2007	
	Gateway Garage		Parking 600 cars			106	\$ 9,165	2007	
	Bartlett Center		Graduate Life Sciences - Academic			122	\$ 41,900	2008	
New buildings, planned for next 5 years									
	Building name		Purposes		Assignable Square Feet (000)		Cost (000)	Year	
	Sports & Recreation Center		Recreation Center			104	\$ 53,200	2012	
	Gateway II Fitouts		FPE, BETC, BUS			35	\$ 6,150	2012	
	Athletics Garage		Rooftop fields & 600 cars			286	\$ 17,300	2013	
	Residence Hall		Student Housing - 200 beds			29	\$ 15,000	2014	
Major Renovations, past 10 years		The list below includes renovations costing \$ 1.5 million or more							
	Building name		Purposes		Assignable Square Feet (000)		Cost (000)	Year	
	Powerhouse		Utilities modernization			7	\$ 6,000	2006	
	Alumni Field		Sports field			NA	\$ 2,800	2007	
	Goddard Hall		Undergrad Life Sciences			30	\$ 11,500	2009	
	Salisbury Labs		Academic Classrooms & Offices			16	\$ 3,791	2010	
	Alden Memorial Auditorium		Exterior roof and masonry			NA	\$ 1,497	2011	
	Washburn Shops		Exterior roof and masonry			NA	\$ 1,600	2011	
	Lee St. Facilities		Offices and Trade Shops			9	\$ 3,000	2011	
Renovations planned for next 5 years		The list below includes renovations costing \$ 1.5 million or more							
	Building name		Purposes		Assignable Square Feet (000)		Cost (000)	Year	
	Stoddard Labs		Decommission Nuclear Reactor			3	\$ 3,500	2012	
	Alumni Gym		Center for Innovation			27	\$ 10,000	2013	

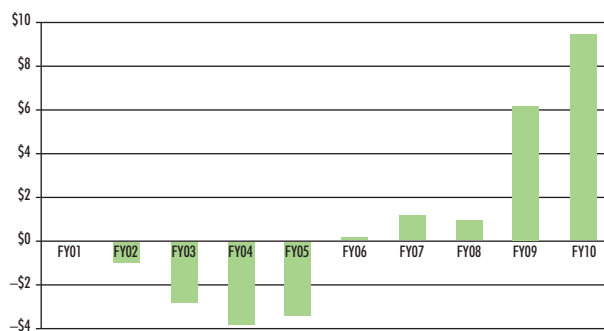
Standard Nine: Financial Resources

Description and Appraisal

Financial Condition

By the most significant measures of financial and industry health, and as the graphs below and tables in this standard indicate, Worcester Polytechnic Institute is in a solid financial position and has effectively managed its resources through recent difficult economic times. Under President Berkey's leadership, WPI has placed a strong emphasis on enrollment management and fiscal responsibility with very positive results. Having inherited operating deficits upon his arrival in 2004, President Berkey strengthened WPI's senior leadership team and implemented strategies to increase undergraduate and graduate enrollment, increase and use financial aid effectively to achieve enrollment and financial goals, moderate the rates of tuition increases, increase its research base, turn around its Corporate and Professional Education Division, grow and develop nontraditional sources of revenues, and use debt to support strategic initiatives, while employing conservative budgeting practices to achieve operating surpluses. The results have been six consecutive years (FY 2006 through projected FY 2011) of operating budget surpluses allowing for significant resources to be available to support the goals and objectives of the WPI Strategic Plan.

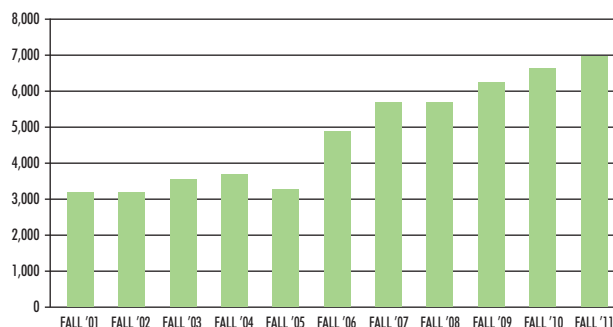
Change in Net Assets from Operating Activities
(in millions)



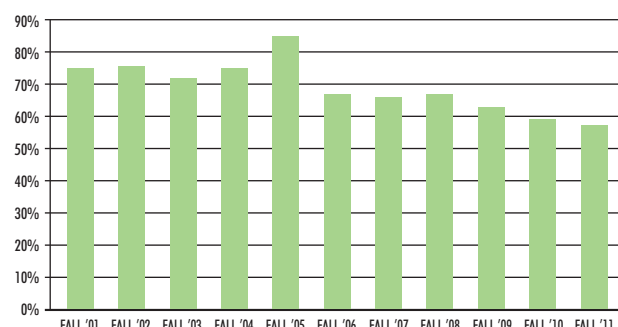
Total Net Assets
(in millions)

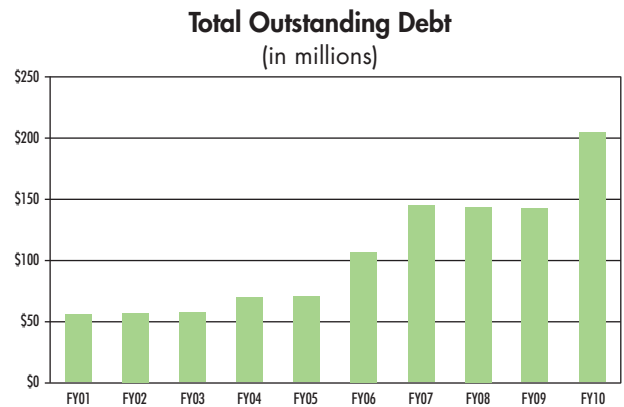
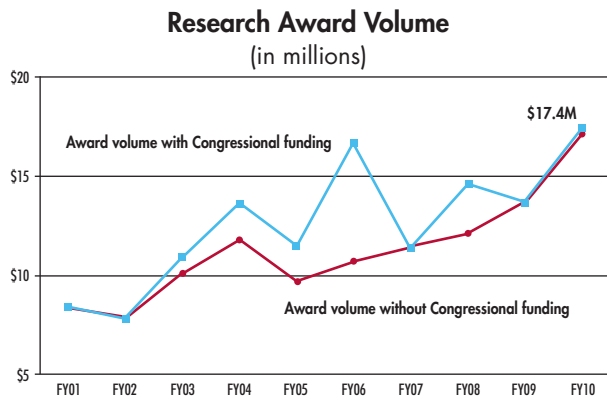
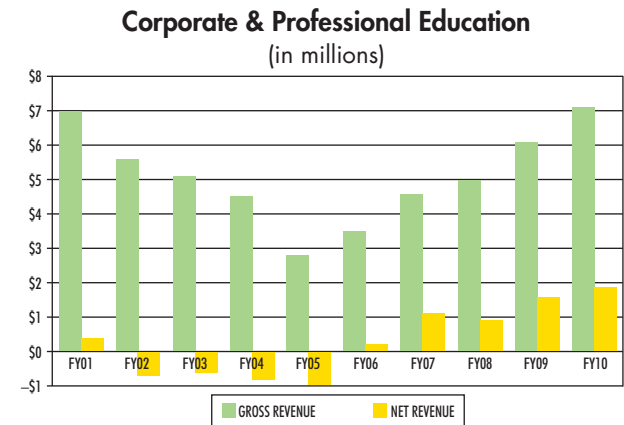
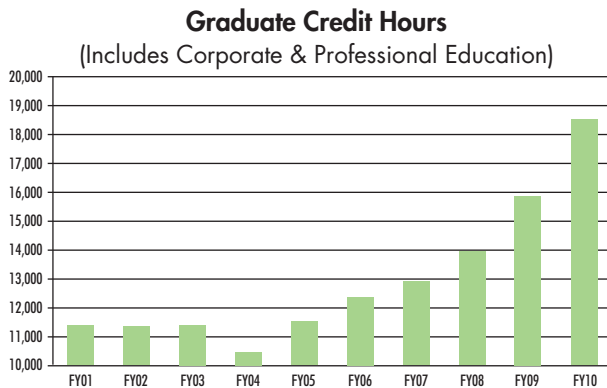
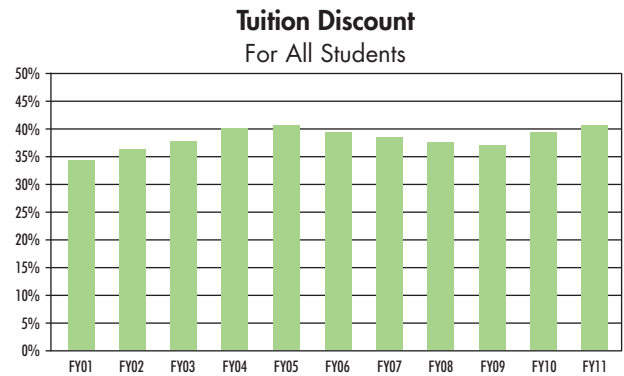
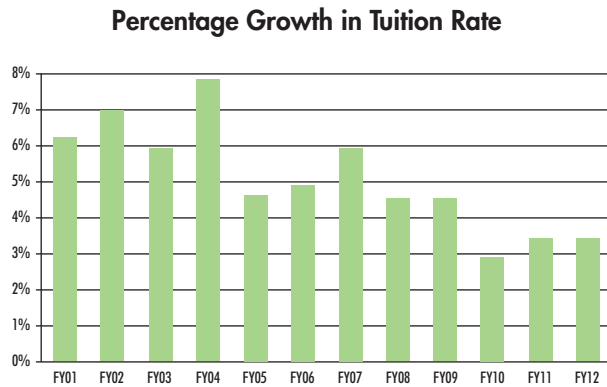
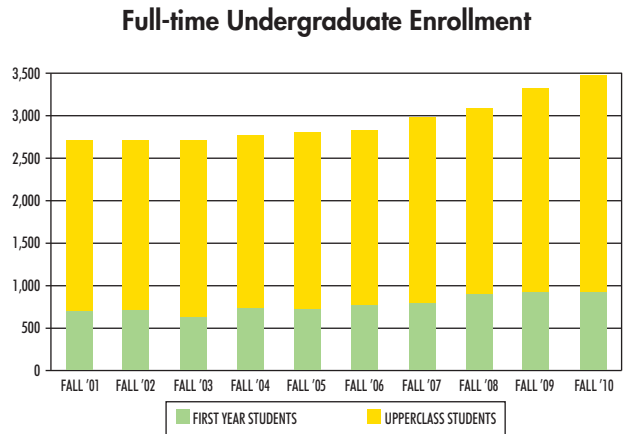
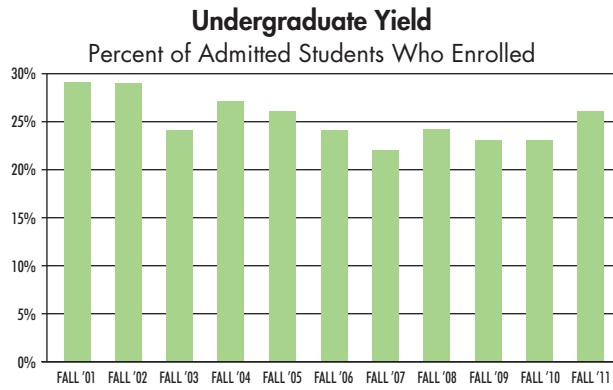


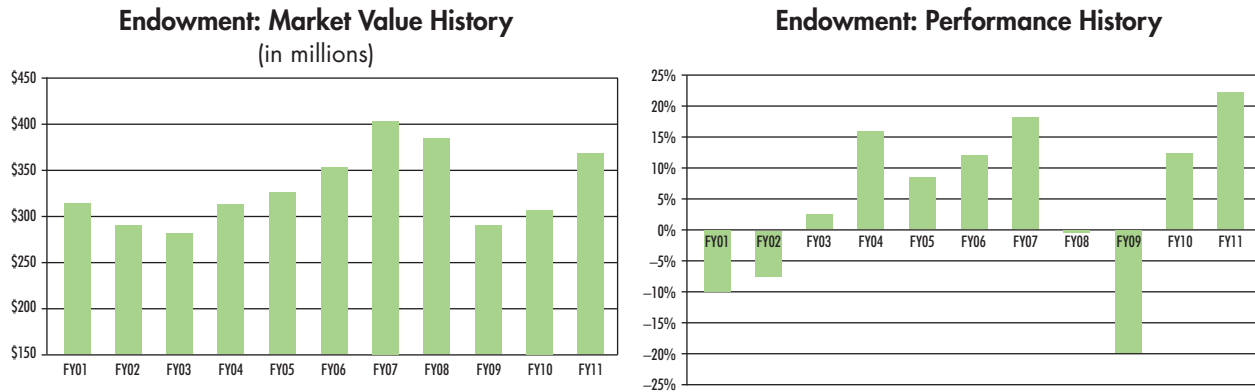
Undergraduate Applications



Undergraduate Selectivity
Percent Admitted







The university maintains public credit ratings with Moody's and Standard & Poor's. Both agencies have strong underlying ratings on WPI, with Moody's at A1 (latest review January 2010) and Standard and Poor's at A+ (latest review March 2011). Both give WPI stable outlooks. These strong ratings have been maintained while the university's outstanding debt has increased from approximately \$71 million in 2005 to approximately \$205 million at June 30, 2010. The agencies cite WPI's recent strong operating performance, improving financial resources, and growing demand from strengthening market position, offsetting the significant increase in debt in recent years and commensurate higher debt burden on the operating budget, as reasons for the continued strong ratings. At this time, WPI has no plans to utilize additional debt.

The ratios in the table below are deemed significant by the rating agencies in determining the overall financial strength of an institution. The 2009 medians are the latest available at this time.

Significant Ratio & Definition	WPI Actual FY2009	WPI Actual FY2010	Moody's Large "A" Medians FY2009
1. <u>Expendable Financial Resources to Debt</u> (Measures availability of expendable net assets to cover long-term debt)	1.76	1.15	0.8
2. <u>Expendable Financial Resources to Operations</u> (Measures amount of time in years institution can cover expenses without relying on additional net assets from operations)	1.67	1.52	0.6
3. <u>Maximum Annual Debt Service to Operations</u> (Measures debt affordability & other flexibility within operating budget)	6.5%	7.9%	5.2%
4. <u>Operating Margin</u> (Indicates excess margin by which revenues cover operating expenses)	3.0%	10.7%	3.3%

Budget Planning and Analysis

Major budgetary and resource allocation decisions and planning are considered within the context of the WPI Strategic Plan, adopted by the Board of Trustees in 2008. The Strategic Plan (for the period FY2008 to FY2015), along with the university's Mission Statement and the President's 2006 Vision Statement, guides tactical and long-range planning. Macroeconomic and industry trends, along with information regarding peer institutions (AITU and other schools with significant cross-application history), are factored into the planning process. As a policy of the Board of Trustees, WPI must operate within a balanced annual operating budget.

Budget planning at WPI is done within the context of a five-year rolling operating budget model, along with an annual operating and capital budget development cycle. A Major Capital Plan, adopted by the Board of Trustees in 2008 and updated in May 2011, guides major investments in facilities. Using the current year operating budget and latest projection as a base, revenue and expenditure assumptions and parameters are input for the following four years. Major parameters and assumptions include freshman class size and undergraduate enrollment, graduate credit hours, tuition rates, room and board rates, tuition discount rates, CPE net revenues, endowment draw rates, salary and benefit increases, number of new faculty and staff positions, volume increases for strategic initiatives, inflation adjustments, depreciation funding, and level of contingency. Given the concerns regarding the economic decline, and to conservatively hedge the revenue increases associated with the growth strategy, the WPI operating budget included an increased contingency reserve beginning in 2008. The reserve has been increased from \$1.2 million in FY2008 to \$3 million in FY2011. This represented 2.1 percent of net revenues in FY2011 compared to 1.5 percent in FY2007. The five-year model is regularly updated based on the latest projections. Beginning in fiscal 2006, WPI adopted fully integrated annual operating and capital budgeting.

The university's operating budget remains tuition dependent, with tuition net of financial aid budgeted at about 52 percent of total revenues in FY2012. However, significant efforts have been under way to continue to diversify the university's revenue stream in accordance with the strategic plan. As shown above, graduate credit hours have increased significantly over the past few years, and net graduate revenues currently comprise about 10.6 percent of total revenues. Corporate and Professional Education revenues account for approximately 5.5 percent and have been in a positive trend for several years. Auxiliary revenues, which are derived primarily from student housing and board, represent 12.4 percent of total operating revenue and have grown along with the increasing undergraduate population. The endowment's support of the operating budget has declined to 10.7 percent as a result of the market decline in 2008 on the three-year rolling average, coupled with the planned reduction in the spending rate.

The reliability of the starting point of the model is critical to the credibility of the output. To this end, a thorough analysis of each departmental budget-to-actual and its operating trends is conducted at the close of each fiscal year and discussed with each divisional vice president and the Provost. This begins to inform the annual operating and capital budgets development cycle that commences in the fall under the leadership of the President, and the Executive Vice President and Chief Financial Officer (through the Office of Budget and Planning). At the October meeting of the Board of Trustees' Budget and Finance Committee, a full review of the prior fiscal year operating and capital budget results takes place, along with an update on any budgetary issues for the current fiscal year and discussions about strategic priorities to consider in the next year's budget development cycle. Macroeconomic and industry trends and concerns are also discussed. The administration provides the committee a progress-to-date summary in achieving the goals and objectives of the Strategic Plan.

The annual operating and capital budgets development process is designed to include a broad constituency of the university and to elicit programmatic, administrative, and physical resource needs. As such, divisional vice presidents and the Provost work closely with their reports to develop formal requests as well as ways to improve efficiency and effectiveness for redeployment of resources to fund more institutionally critical items.

In late fall, requests for volume changes to operating budgets and capital items (e.g., IT and other equipment, facility improvement projects, and faculty start-up funding) are received from each divisional vice president and the Provost. Divisional budget hearings are then scheduled for the President with each vice president and the Provost to present budget plans. This allows for the President to gain a full understanding of resource needs throughout the university and how funding requests for new initiatives may further the goals and objectives of the Strategic Plan. The totality of the requests are aggregated and reviewed within the context of the budget model to determine available resources. The administration also engages the Administrative and Financial Policy Committee of the faculty in a discussion of major budget parameters and assumptions. The

vice presidents, Provost, and President then determine the final resource allocations for the next fiscal year. Major operating budget parameters and assumptions, and a fully developed capital budget, are then presented to the Budget and Finance Committee at its February meeting for review and approval. The Board of Trustees Facilities and Campus Infrastructure Committee also reviews and approves the annual capital budget proposal in detail. The committees then present the results of their reviews to the full Board for its approval. During the following months, the detailed line item operating budget is prepared and then presented in May to the Budget and Finance Committee, which makes its recommendation for approval at that time to the full Board. On July 1 the final line-item operating budget for the new fiscal year with salaries budgeted by position is loaded into Banner Finance.

Transparency regarding the development and outcomes of the university's budget has increased significantly during President Berkey's tenure. Presentations to the community through several venues are made during the year. These include updates at University Council, the community town meetings in the spring and fall, a faculty meeting in the spring, and through presidential letters to the community.

University budget managers may view their budgets electronically in Banner Finance or through a web self-service version. They are able to view transactions as they are posted by the accounting staff or fed from other Banner modules. Reports showing budgets in summary or detailed transactions can be run at any time and from off campus. Managers are supported by the Office of Budget and Planning, which offers training and one-on-one assistance in the development of budgets, analysis of operating activity compared to budget, and resolution of budget issues. The Budget Office continuously monitors and analyzes departmental budgets and overall university revenues and expenses throughout the year. Projections of year end results compared to budget are regularly reported to the Executive Committee and the Budget and Finance Committee of the Board.

As noted in the Fifth-Year Interim Report to NEASC, while WPI operates within a balanced budget framework, there were certain needed investments that had not received adequate funding or consideration within the operating budget. Conversely, certain resources were being used to a greater extent than what may be prudent for the long term. WPI identified three such areas: faculty and staff salaries below appropriate benchmarks; underfunding of depreciation providing for limited deferred maintenance reinvestments; and an endowment draw rate in excess of industry best practices. In FY 2008 WPI began to address these concerns.

With respect to faculty and staff salaries being below benchmarks, performance and salary reviews are conducted annually. The salary administration process involves reviewing the performance of all faculty and staff, comparing salaries to peer institutions using survey benchmark data, and awarding salary increases. Four years ago, WPI recognized that its pay for performance system was not having the desired effect, which was to appropriately reward its employees based on their performance. It also became quite clear that WPI's full professors were paid substantially below market according to the benchmark data. As a result, WPI restructured its salary administration process to more closely align pay with performance and to ensure that available salary dollars were used in the most strategic manner. WPI developed a compensation philosophy designed to attract, retain, and motivate its top performers. The compensation philosophy established a goal to bring WPI's average faculty salaries, for all ranks, to at least the 60th percentile of its peer institutions, based on benchmark data. As a result of WPI's strong financial performance combined with the fact that many of its peer institutions were not able to award salary increases, WPI's salary increases have outpaced its competitors over the past several years. While overall increases for private institutions for FY10 and FY11 were 0 percent and 2 percent, respectively (according to the College and University Professional Association of Human Resources – CUPA-HR), WPI's were 3 percent each year. WPI has also invested about \$800,000 over the past four years to bring its full professors' salaries to the appropriate level. WPI's top performing faculty and staff are now, on average, paid at or above the 60th percentile according to the benchmark data of peer institutions.

WPI does not budget depreciation within the annual operating budget at the level necessary to fully fund the university's deferred maintenance needs. While significant operating surpluses have been generated since 2006 (approximately \$41 million through June 30, 2011), the annual operating budget has not been sufficiently increased for higher levels of funded depreciation. As more fully described in Standard Eight, addressing deferred maintenance is a constant challenge on most university campuses and remains in continual focus at WPI. A thorough understanding and evaluation of WPI's physical resources are an integral component to ensuring that such resources are being utilized, maintained, and managed properly to support the university's mission. To gain a better understanding of the deferred maintenance needs of the campus, this past fiscal year WPI commissioned Strategic Building Solutions to prepare a Facilities Condition Assessment Plan (FCAP).¹ The Plan will inform the development of future capital plans and budgets (this started with the FY 2012 capital budget) with respect to deferred maintenance on the campus. A plan is being developed to determine an appropriate target level of deferred maintenance (based on WPI standards and industry best practices), along with a budgetary strategy to meet the target over a reasonable period of time. Results of FCAP were made to the Facilities and Campus Infrastructure Committee at its May 2011 meeting. The seven-year Major Capital Plan, also described in more detail in Standard Eight, provides additional funding for high-priority deferred maintenance. The Major Capital Plan articulates approximately \$140 million in high-priority capital projects and potential funding sources. Funding sources include campaign achievement, use of debt (issued in January 2010), and use of operating surpluses as generated. It is estimated that from July 1, 2008, to June 30, 2012, approximately \$79 million of funded projects will be completed. The successful achievement of the Campaign for WPI will be necessary for full implementation of the plan.

WPI's endowment spending rate had been set at 5.5 percent, based on the average of the unit market values of the previous three years (had been a two-year average as noted in the 2001 Self-Study), one year removed. While the methodology for calculating the draw is generally consistent with industry best practices, the administration noted that the 5.5 percent avilment rate was in excess of such best practices. A plan was put in place beginning with the FY 2011 operating budget (5.4 percent used) to reduce the draw rate by 10 basis points per year until the rate reaches 5 percent. The FY 2012 operating budget includes a 5.3 percent rate. The impact on future years' operating budgets will be reviewed to ensure that the next year's reduction is feasible. The university's five-year budget model takes these reductions into consideration.

Educational Affordability

WPI has long been committed to making its educational program accessible and affordable. At the executive level, President Berkey has led comprehensive efforts on the part of the university to reduce expenses, limit tuition increases, and dramatically increase financial aid. The Trustees regularly review admissions and financial aid metrics to assess short-term outcomes and long-term trends. Within the Enrollment Management Division, need-based and merit-based aid is used to the fullest extent as a way of enrolling the most qualified and most diverse students possible.

In the last five years, WPI has increased its institutional aid to undergraduates by nearly 60 percent, from approximately \$38 million in fiscal 2008 to \$60 million in fiscal 2012. The average grant has increased by 20 percent during this same time frame, from \$14,361 to \$17,300. Well over 90 percent of this high-ability undergraduate population receives institutional scholarship funds. For this year's incoming class, 95 percent of the students are receiving institutional scholarships with an average grant of \$17,167. The chart below shows WPI's aid and tuition increases in recent years, compared with national averages for private institutions as reported by the National Association of Independent Colleges and Universities (NAICU).

¹ See Standard Eight for additional details about FCAP.

FY	Total Institutional Aid	% Increase	Average Grant	Students Receiving Aid (unduplicated headcount)	Tuition	% Increase	National Avg Cost Increase (NAICU)
FY'12	\$59,997,640	12.8%	\$17,300	3,468	\$39,450	3.4%	N/A
FY'11	\$53,171,468	9.9%	\$16,569	3,228	\$38,140	3.4%	4.6%
FY'10	\$48,365,769	17.0%	\$15,612	3,098	\$36,890	2.9%	4.5%
FY'09	\$41,331,954	9.0%	\$14,569	2,837	\$35,850	4.5%	4.3%
FY'08	\$37,926,107	—	\$14,361	2,641	\$34,300	4.5%	5.9%

WPI staff in multiple offices work closely to provide returning students and their parents with the highest level of support and assistance. The chief financial officer and the chief enrollment officer meet weekly with the Director of Financial Aid, the Bursar, the Registrar, and the Director of Residential Services, among others, to review student appeals, to monitor trends, and to fine-tune communications and policies related to bill payment. As an outgrowth of these recurring discussions, WPI now offers students a range of services to help them manage the high cost of their college education:

- Extended payment program, allowing families to stretch tuition payments over 12 months rather than the usual 10 months;
- 50 percent tuition reduction for core classes taken in E-Term, allowing students to re-take core classes in the summer at half the usual cost;
- Tuition incentive program for recent graduates, whereby students can accelerate their course-taking in the first year of graduate study if they choose to pursue a master's degree at WPI within the first five years of completing their undergraduate work at WPI;
- Move-in day loan and payment counseling offered on-site for all new students who arrive on campus with a significant outstanding balance;
- Financial literacy program, newly developed by the Financial Aid Office to help current students understand and manage their personal finances.

Over the last 10 years, WPI has made tremendous gains in terms of attracting and retaining an exceptionally talented and increasingly diverse student body, while achieving significant growth. The fact that these gains were made during times of financial difficulty bears testimony to the considerable financial support provided by the institution on all levels.

Campaign for WPI

The WPI Strategic Plan reflects its commitments to its core values and continuous improvement to secure WPI's place as one of the nation's most important higher education institutions.

The Campaign for WPI is a seven-year comprehensive fundraising initiative to support the Strategic Plan. It is student-focused and celebrates how firmly WPI believes in the leaders it is educating for tomorrow. The leadership (quiet) phase of the campaign started on June 1, 2007, with the four primary goals of the campaign being:

Purpose	Goal	Progress to Date
Student Financial Aid	\$75 million	\$39.0 million
Campus Life & Academic Facilities	\$55 million	\$27.5 million
Faculty & Academic Support	\$50 million	\$20.1 million
Unrestricted Funds	\$20 million	\$8.6 million
Undesignated	N/A	\$4.9 million
TOTAL	\$200 million	\$100.1 million

The WPI Trustees and administration have been strongly engaged in both the planning and implementation of the Campaign. In 2007 The Wayland Group was retained to conduct a campaign feasibility study and implementation plan. A cornerstone of the implementation plan was the development of gift acceptance policies and valuation guidelines, which were presented to and accepted by the WPI Board of Trustees.

Gifts raised by WPI's development efforts focus exclusively on supporting the university in carrying out its mission. Gifts of cash, securities, and other forms of property are welcomed to defray general operating costs, to help build the university's endowment, and to assist in a variety of special purposes, which align the needs of the Institute and the interests of its donors. By defining the types of gifts that are acceptable, the different forms gifts may take, and the requirements for accepting gifts, the guidelines facilitate the appropriate use and accountability of gifts received by WPI. WPI does not provide tax, financial, or legal advice to donors and strongly recommends that donors seek advice from professional financial and legal advisors.

For campaign and fundraising purposes, gifts normally are credited according to the standards promulgated by the donor's gift agreement. WPI adheres to the rules and standards of the Financial Accounting Standards Board for financial statement and audit purposes and follows the requirements and regulations of the Internal Revenue Code for tax reporting purposes.

In addition to providing a sound framework for the management of the Campaign, the findings of The Wayland Group study identified a critical shortage in staffing for a \$200 million campaign. The administration acted on recommendations with a multi-year campaign plan, which resulted in 14 new positions for the Development and Alumni Relations Division, including six new front-line fundraisers. Incremental funding for the Campaign in FY11 and FY12 alone resulted in about \$550,000 and \$500,000, respectively. Since June 2007, the division's budget has increased 53 percent—from \$3.3 million to \$5.1 million.

Another challenge the administration addressed was the need to co-locate the frontline fundraising and operations team, which in 2007 was located in five different sites on campus. With the support of the administration, over \$1 million was allocated to build out and furnish office space to bring together the 31 staff members directly involved in the Campaign. Additional funds were directed to upgrading the Student Calling Center with new paint, furniture, phones, computers, and software.

The continued success of the WPI campaign is predicated on expanding the pipeline of major gifts by converting prospects from low-to-high inclination and by increasing the return on asks. The national economic uncertainty of the past two years has had a negative impact on momentum and resulted in lower than anticipated gifts. However, the Campaign Executive Committee, consisting of the President and five current and former Trustees, is fully engaged in developing strategies, and soliciting and closing seven- and

eight-figure commitments. Giving by the Trustees stands at 100 percent with the opportunity to upgrade and revisit second commitments during the life of the Campaign.

Now in its fourth year of the leadership phase, the Campaign has achieved approximately \$100 million. The immediate objective is to reach \$120 million in the current fiscal year and publicly announce the Campaign in June 2012.

Use of Debt

WPI has significantly increased its outstanding debt since 2003, with the larger increases occurring since 2005. In 2003 WPI issued \$15 million (net proceeds of approximately \$14.4 million) of revenue bonds to address significant deferred maintenance items at that time. In 2005 \$40 million of debt was issued to develop the Life Sciences and Bioengineering Center at Gateway Park. East Hall, a 232-bed upperclass residence hall with an adjacent parking garage, was funded with debt of approximately \$41 million issued in 2007. In 2010 WPI issued \$56 million of debt to jump-start the sources of funding for the seven-year Campaign for WPI, an integral component of which is the new Sports and Recreation Center. Finally, approximately \$8 million of debt was taken on in 2010 to acquire the Worcester Business Development Corporation's 50 percent ownership interests in the Gateway Park-related entities. The university is comfortable with this increased level of debt and has no plans to issue additional debt in the near term. The rating agencies note that additional debt capacity is limited at the current ratings levels without commensurate increases in financial resources. The university's debt structure is conservative with respect to derivatives exposure and annual debt service requirements. The strategy of creating fairly level annual debt service over the life of its outstanding debt allows for confidence in budgeting and modeling and more closely reflects the useful lives of the assets being financed. With only approximately 26 percent of its debt in variable rate mode with fixed interest rate swaps, significant swings in interest costs, as well as any potential collateral posting requirements under the swap agreements, are manageable.

Endowment

WPI's endowment and similar funds stand at approximately \$370 million at June 30, 2011, after peaking at approximately \$405 million in 2007, and hitting a relative low point of approximately \$292 million in 2009. Under the supervision of the Board of Trustees Investment Committee and supported by an independent investment consultant, Prime Buchholz, a broadly diversified asset allocation policy has been implemented that is expected to provide a high rate of total return with an appropriate level of risk. Actual performance is reviewed monthly, and at each meeting of the Investment Committee a full discussion of the portfolio and of each manager takes place based on appropriate peer and industry benchmarks. A review of overall portfolio liquidity is a part of each meeting. Overall average annual performance has been above peer medians (41st percentile) for the 10 years ended December 31, 2010.

Financial Management

Under the leadership of the Executive Vice President and Chief Financial Officer, who has nearly 17 years of experience in complex higher education institutions, the financial management of the university has been strengthened in the areas of budget and planning, controller, and financial services, with well-qualified professionals fully able to discharge their duties. The Acting Controller (assumed the controllership in 2010 when the prior controller left the university) and the Assistant Vice President of Budget and Planning (a WPI veteran of 24 years) are Certified Public Accountants, and the Director of Financial Services (hired in 2006) acted in similar capacities at another higher education institution. Each participates in professional development opportunities to ensure that best practices are continually being considered and implemented.

The integrity, accuracy, and safeguarding of the university's financial assets—and financial reporting that is in accordance with generally accepted accounting principles and in compliance with federal and state regulations—is the responsibility of the Controller's Office, which reports directly to the Executive Vice

President and Chief Financial Officer. Since the 2001 Self-Study, the university has improved the timeliness of its financial reporting and breadth of its financial disclosures, and overall strengthened its Board of Trustees Audit Committee oversight. Beginning in FY 2006, a review of best practices for higher education relating to the Sarbanes-Oxley Act (SOX) was undertaken. The Audit Committee charter was subsequently revised in 2007 to incorporate many of these best practices relating to member independence, auditor selection and approval, audit scope, audit partner rotation, evaluation of internal controls and risk exposures, business ethics and conflicts of interest, and reviews of audits, management letters, and tax filings. The fiscal year audit is currently performed by PricewaterhouseCoopers (PWC) and is conducted in August with a completion and final review by the Audit Committee in September. The Audit Committee recommends acceptance of the audit and management letter to the full Board for approval at its October meeting. PWC also audits WPI's Report on Federal Awards in Accordance with OMB Circular A-133, which is reviewed by the Audit Committee in the spring prior to its filing deadline. Recent Management Letters issued by PWC have contained limited comments and such comments have been addressed timely by the administration. PWC regularly reports to the Audit Committee its comfort with the levels of financial statement disclosure and WPI's audit preparedness.

As part of its implementation of best practices relating to SOX, beginning in 2008 WPI hired an accounting firm to document internal controls in its major business cycles. The project will be completed in fiscal 2012. Additionally, WPI promulgated a Business Ethics Policy in 2008 designed to help employees and caretakers perform their duties in a manner that supports and advances WPI's mission and goals. WPI further engages Ethics Point to provide the community a way to anonymously and confidentially report activities that may involve unethical or otherwise inappropriate activity or behavior in violation of WPI's established policies and the Business Ethics Policy. The Audit Committee is regularly updated on any reports submitted to Ethics Point. Since its inception in 2008 no such reports have been received by Ethics Point.

WPI maintains and regularly updates its various fiscal policies. Most policies are available to the community online. A specific effort is ongoing to make sure that all appropriate fiscal policies are in place and are kept current.

Projection

As described throughout this standard, WPI is in solid financial condition and has sufficient financial resources to sustain the achievement of its educational objectives and to further institutional improvement prospectively. A strong senior leadership team is in place, and has significantly strengthened the financial management of the institution. Positive trends in major revenue categories and the tuition discount rate as well as continued diversification of revenue streams, along with diligent expense management and conservative budgeting bode well for WPI's further achievement of the goals of the Strategic Plan. The pace of growth and change may accelerate with the inaugural Academic Deans fully on board and as their individual strategic plans are developed and implemented, particularly with respect to graduate education and research. The continued development and refinement of the five-year sustainable academic and financial model will become increasingly more important to ensure that adequate resources are available to support and enhance these initiatives. Over the next several years, the anticipated decline in the endowment's support of the operating budget and the funding of a financial plan to adequately address deferred maintenance must continue to be considered in WPI's financial planning. The successful completion of the Campaign for WPI is important to add significant new resources for scholarships, faculty support, and facilities development in accordance with the Capital Plan. WPI will continue to be mindful of its limited debt capacity at its current ratings levels in its future planning. Notwithstanding factors WPI cannot control (e.g., worsening of the economy and its impact on financial aid, investment performance, and giving, increased competition from peer institutions, federal budget cuts for research funding), WPI should continue to have the resources necessary to support its growth strategies and to maintain and enhance its financial and physical resources.

Standard 9: Financial Resources					
(Statement of Financial Position/Statement of Net Assets)					
FISCAL YEAR ENDS: June 30	2 YEARS PRIOR (FY 2008)	1 YEAR PRIOR (FY 2009)	MOST RECENT YEAR	Percent Change yrs-1 yr prior	2 1 yr-most recent
ASSETS					
CASH AND SHORT TERM INVESTMENTS	\$11,065	\$11,141	\$19,854	0.7%	78.2%
CASH HELD BY STATE TREASURER				-	-
DEPOSITS HELD BY STATE TREASURER				-	-
ACCOUNTS RECEIVABLE, NET	\$6,297	\$3,985	\$4,789	-36.7%	20.2%
CONTRIBUTIONS RECEIVABLE, NET	\$11,315	\$15,381	\$17,570	35.9%	14.2%
INVENTORY AND PREPAID EXPENSES	\$4,551	\$4,607	\$4,918	1.2%	6.8%
LONG-TERM INVESTMENTS	\$404,387	\$307,219	\$333,532	-24.0%	8.6%
LOANS TO STUDENTS	\$21,168	\$21,702	\$22,551	2.5%	3.9%
FUNDS HELD UNDER BOND AGREEMENT	\$8,668	\$454	\$52,993	-94.8%	11572.5%
PROPERTY, PLANT AND EQUIPMENT, NET	\$176,797	\$185,817	\$191,305	5.1%	3.0%
OTHER ASSETS	\$17,154	\$13,379	\$16,074	-22.0%	20.1%
TOTAL ASSETS	\$661,402	\$563,685	\$663,586	-14.8%	17.7%
LIABILITIES					
ACCOUNTS PAYABLE AND ACCRUED LIABILITIES	\$18,808	\$14,781	\$17,931	-21.4%	21.3%
DEFERRED REVENUE & REFUNDABLE ADVANCES	\$7,318	\$7,323	\$7,879	0.1%	7.6%
DUE TO STATE				-	-
DUE TO AFFILIATES				-	-
ANNUITY AND LIFE INCOME OBLIGATIONS	\$11,193	\$10,045	\$9,532	-10.3%	-5.1%
AMOUNTS HELD ON BEHALF OF OTHERS	\$4,040	\$2,747	\$2,857	-32.0%	4.0%
LONG TERM DEBT	\$143,987	\$141,789	\$204,450	-1.5%	44.2%
REFUNDABLE GOVERNMENT ADVANCES	\$6,792	\$6,792	\$6,792	0.0%	0.0%
OTHER LONG-TERM LIABILITIES	\$8,682	\$11,758	\$13,931	35.4%	18.5%
TOTAL LIABILITIES	\$200,820	\$195,235	\$263,372	-2.8%	34.9%
NET ASSETS					
UNRESTRICTED NET ASSETS					
INSTITUTIONAL	\$234,037	\$175,802	\$197,122	-24.9%	12.1%
FOUNDATION				-	-
TOTAL	\$234,037	\$175,802	\$197,122	-24.9%	12.1%
TEMPORARILY RESTRICTED NET ASSETS					
INSTITUTIONAL	\$117,869	\$79,313	\$78,613	-32.7%	-0.9%
FOUNDATION				-	-
TOTAL	\$117,869	\$79,313	\$78,613	-32.7%	-0.9%
PERMANENTLY RESTRICTED NET ASSETS					
INSTITUTIONAL	\$108,676	\$113,335	\$124,479	4.3%	9.8%
FOUNDATION				-	-
TOTAL	\$108,676	\$113,335	\$124,479	4.3%	9.8%
TOTAL NET ASSETS	\$460,582	\$368,450	\$400,214	-20.0%	8.6%
TOTAL LIABILITIES AND NET ASSETS	\$661,402	\$563,685	\$663,586	-14.8%	17.7%

Standard 9: Financial Resources					
(Statement of Revenues and Expenses)					
FISCAL YEAR ENDS June 30	TWO YEARS PRIOR (FY 2009)	MOST RECENTLY COMPLETED YEAR (FY 2010)	CURRENT BUDGET (FY 2011)	NEXT YEAR FORWARD (FY 2012)	TWO YEARS FORWARD (FY 2013)
OPERATING REVENUES (FY 2011-13 amounts are based on university operating budget presentation rather than GAAP based reporting.)					
TUITION & FEES	\$126,530	\$139,783	\$141,217	\$156,527	\$164,512
ROOM AND BOARD					
LESS: FINANCIAL AID	(\$45,260)	(\$52,711)	(\$54,138)	(\$57,392)	(\$59,224)
NET STUDENT FEES	\$81,270	\$87,072	\$87,079	\$99,135	\$105,288
GOVERNMENT GRANTS & CONTRACTS	\$19,455	\$22,382			
PRIVATE GIFTS, GRANTS & CONTRACTS	\$5,114	\$3,218	\$2,500	\$2,500	\$2,700
OTHER AUXILIARY ENTERPRISES	\$16,364	\$18,084	\$18,609	\$19,288	\$20,060
ENDOWMENT INCOME USED IN OPERATIONS	\$22,000	\$21,892	\$18,361	\$16,576	\$15,237
OTHER REVENUE: Other educational activities	\$8,887	\$9,578	\$10,072	\$12,347	\$12,841
OTHER REVENUE: Indirect Cost Recovery; Miscellaneous	\$2,304	\$2,082	\$3,640	\$5,347	\$5,347
NET ASSETS RELEASED FROM RESTRICTIONS					
TOTAL OPERATING REVENUES	\$155,394	\$164,308	\$140,261	\$155,193	\$161,472
OPERATING EXPENSES					
INSTRUCTION	\$54,399	\$58,384	\$57,438	\$64,340	\$66,985
RESEARCH	\$12,958	\$14,246			
PUBLIC SERVICE					
ACADEMIC SUPPORT	\$32,837	\$32,520	\$16,930	\$20,315	\$21,128
STUDENT SERVICES	\$9,083	\$9,966	\$8,955	\$9,684	\$10,071
INSTITUTIONAL SUPPORT			\$28,427	\$29,971	\$31,170
FUNDRAISING AND ALUMNI RELATIONS	\$6,415	\$6,718	\$7,186	\$9,149	\$9,515
OPERATION, MAINTENANCE OF PLANT (if not allocated)	\$25,516	\$24,925	\$12,657	\$12,843	\$13,357
SCHOLARSHIPS & FELLOWSHIPS (Cash refunded by public institutions)					
AUXILIARY ENTERPRISES	\$8,044	\$8,139	\$8,668	\$8,891	\$9,247
DEPRECIATION (if not allocated)					
OTHER EXPENSES (specify):					
OTHER EXPENSES (specify):					
TOTAL OPERATING EXPENDITURES	\$149,252	\$154,898	\$140,261	\$155,193	\$161,472
CHANGE IN NET ASSETS FROM OPERATIONS	\$6,142	\$9,410	\$0	\$0	\$0
NON OPERATING REVENUES * The university does not budget or project non operating activity.					
STATE APPROPRIATIONS (NET)					
INVESTMENT RETURN	(\$85,345)	\$28,217	*	*	*
INTEREST EXPENSE (public institutions)					
GIFTS, BEQUESTS & CONTRIBUTIONS NOT USED IN OPERATIONS	\$9,532	\$11,921	*	*	*
OTHER (specify): Net realized gains on endowment used for operations	(\$15,151)	(\$16,235)	*	*	*
OTHER (specify): Net unrealized (losses)/gains on beneficial interest in trusts	(\$4,492)	\$2,588	*	*	*
OTHER (specify): Change in value of split-interest agreements	\$830	\$76	*	*	*
OTHER (specify): Net realized and unrealized losses on interest rate agreements	(\$3,648)	(\$4,213)	*	*	*
NET NON OPERATING REVENUES	(\$98,274)	\$22,354	*	*	*
INCOME BEFORE OTHER REVENUES EXPENSES, GAINS, OR LOSSES	(\$92,132)	\$31,764	*	*	*
CAPITAL APPROPRIATIONS (public institutions)					
OTHER					
TOTAL INCREASE/DECREASE IN NET ASSETS	(\$92,132)	\$31,764	*	*	*

Standard 9: Financial Resources						
(Statement of Debt)						
FISCAL YEAR ENDS June 30	2 YEARS PRIOR (FY 2009)	MOST RECENTLY COMPLETED YEAR (FY 2010)	CURRENT BUDGET (FY 2011)	NEXT YEAR FORWARD (FY 2012)	TWO YEARS FORWARD (FY 2013)	
DEBT						
BEGINNING BALANCE	\$143,987	\$141,789	\$204,450	\$201,551	\$198,507	
ADDITIONS	-	\$74,362	-	-	-	
REDUCTIONS	(\$2,198)	(\$11,701)	(\$2,899)	(\$3,044)	(\$3,038)	
ENDING BALANCE	\$141,789	\$204,450	\$201,551	\$198,507	\$195,469	
INTEREST PAID DURING FISCAL YEAR	\$6,726	\$6,304	\$9,997	\$9,801	\$9,862	
CURRENT PORTION	\$3,519	\$2,899	\$3,044	\$3,038	\$4,243	
BOND RATING	A1/A+	A1/A+	A1/A+	A1/A+	A1/A+	
DEBT COVENANTS:						
	Payment of the principal of, the purchase price of, and interest on each series of the 2008 Bonds, when due, is collateralized by irrevocable direct pay letters of credit by TD Bank that expire in 2013. The letters of credit include financial covenants that require that the University maintain minimum expendable net assets to debt of at least 0.65 and a minimum long term credit rating of A3/A-.					

Standard 9: Financial Resources						
(Supplemental Data)						
FISCAL YEAR ENDS June 30		2 YEARS PRIOR (FY 2009)	MOST RECENTLY COMPLETED YEAR (FY2010)	CURRENT BUDGET (FY 2011)	NEXT YEAR FORWARD (FY 2012)	TWO YEARS FORWARD (FY 2013)
	NET ASSETS					
	NET ASSETS BEGINNING OF YEAR	\$460,582	\$368,450	\$400,214	\$400,214	\$400,214
	TOTAL INCREASE/DECREASE IN NET ASSETS	(\$92,132)	\$31,764	*	*	*
	NET ASSETS END OF YEAR	\$368,450	\$400,214	\$400,214	\$400,214	\$400,214
* The University does not budget on a GAAP reporting basis and therefore, does not project annual changes in net assets.						
	FINANCIAL AID					
	SOURCE OF FUNDS					
	UNRESTRICTED INSTITUTIONAL	\$35,961	\$41,975	\$47,440	\$51,057	\$53,099
	FEDERAL, STATE & PRIVATE GRANTS	\$4,137	\$4,973	\$4,900	\$4,900	\$4,900
	RESTRICTED FUNDS	\$5,162	\$5,763	\$6,408	\$6,057	\$5,748
	TOTAL	\$45,260	\$52,711	\$52,340	\$55,957	\$57,999
	% DISCOUNT OF TUITION & FEES	35.8%	37.7%	37.1%	35.7%	35.3%
	% UNRESTRICTED DISCOUNT	28.4%	30.0%	33.6%	32.6%	32.3%
	PLEASE INDICATE YOUR INSTITUTION'S ENDOWMENT SPENDING POLICY:					
	The University observes a spending rule with respect to total return (interest, dividends and appreciation) on investments of the endowment and similar funds. Under the spending rule, the University appropriated 5.4% and 5.5% of its endowment and similar funds' average unit fair value for the previous three years, one year removed, for the years ended June 30, 2010 and 2009, respectively. For FY2011, the rate remained at 5.4%. For FY 2012, the rate decreased to 5.3%.					

Standard Ten: Public Disclosure

Introduction

It is critical to WPI that students, prospective students, and other members of the interested public can make informed decisions about the institution, and the institution strives to provide complete, accurate, timely, accessible, and clear information to all parties. This is accomplished through the coordinated use of printed materials and public relations activities, with an increasing focus on social media and the WPI website. The primary responsibility for the accuracy of the content presented belongs to the associated campus departments, with editorial, design, and production support from the Marketing and Communications Division.

Undergraduate and Graduate Catalogs

The most complete and authoritative descriptions of the university are contained in the undergraduate and graduate catalogs.¹ The Dean of Undergraduate Studies and the Administrator of Academic Programs, working with the Committee on Academic Operations, lead an annual review (by all academic departments) of the undergraduate catalog. The Dean of Graduate Studies and the Committee on Graduate Studies and Research are responsible for the annual review of the graduate catalog. Marketing and Communications is responsible for production and printing as well as for creating the web versions of the catalogs.

Each catalog is published in print as well as on the web. The web edition is created from the same final, approved file that is sent to the printer for the print edition and is published in both PDF and HTML formats. WPI maintains 10 years of archived undergraduate and graduate catalogs, both print and PDF. For the undergraduate catalog, any new or experimental courses approved by the faculty since the catalog's printing, as well as notices of errors identified in the printed catalog, are published in an online supplement,² leaving the original catalog unchanged.

The undergraduate catalog contains the university's mission and goal statements, as well as the faculty-approved sets of learning outcomes for the undergraduate program, the qualifying projects, and almost all individual major programs. It contains a complete description of the WPI Plan, including a detailed discussion of the responsibilities of students and of the institution, and special features such as the Great Problems Seminars and the Global Perspective Program. Information on all degree requirements, all majors and distribution requirements, and concentrations and minors within majors, is included. Also included are examples of departmental course sequences and counsel to help students structure their programs.

The catalogs lists all courses offered, along with a guide to which courses are offered annually (Category I) and which are offered every other year (Category II). The Administrator of Academic Programs maintains a list of project opportunities (IQPs and MQPs) on the web³ and faculty update the list regularly. A term-by-term schedule of course offerings is available online before Academic Advising Day each February and the final course schedule, including details of times and most instructor assignments, is published online before registration opens in April for the next academic year. Textbook information is linked to the course schedule website, allowing students to identify all required texts before registration. Course offerings are reviewed each year and any course that has been canceled twice is removed from the catalog, except in cases of mitigating circumstances.

1 Available in the Workroom and at www.wpi.edu/academics/catalogs.

2 The current Undergraduate Catalog supplement is online at www.wpi.edu/academics/catalogs/ugrad/supplement.html.

3 www.wpi.edu/academics/Projects/available.html.

The undergraduate catalog includes a list of all current full-time and emeritus faculty, active and emeritus members of the WPI Board of Trustees, and the university's corporate officers. Additional lists detail, by department or division, all full-time administrators, research facilities and laboratories. The catalog contains an accurate and complete statement on WPI's accreditation by NEASC, ABET, and AACSB.

Admissions criteria and policies are published in the catalog (print and electronic) and on the Admissions website. A separate section of the catalog explains WPI's tuition, student fees, and enrollment deposit, including payment schedules, details on overload charges, and the policies for the reimbursement of tuition and room and board charges upon withdrawal. WPI's policies, application procedures, and offerings in the area of financial aid are also detailed.

All academic policies, ranging from registration for courses and projects to procedures for evaluation of transfer credit, are also published on the web and in the catalogs. These policies, along with most of the required forms, are also accessible through the Office of the Registrar's website.

Information on undergraduate admissions and financial aid, as well as additional information about WPI's academic programs, courses, majors, and faculty, is found in an annual cycle of publications prepared for prospective undergraduate students and as part of the undergraduate admissions website.⁴ More than 50 publications are distributed to prospective students by the Admissions Office, including the WPI Viewbook,⁵ a brochure describing areas of study, and a financial aid brochure. In addition, a virtual campus tour is available online.⁶

Individual academic departments and programs produce newsletters and recruiting materials; some of these are edited and produced by Marketing and Communications. All of these offices and departments maintain websites through which they communicate with their special constituencies.

Additional Publications

The Marketing and Communications Division produces a number of additional publications in order to disseminate important information to the university's many constituencies. These include the university's alumni magazine, *Transformations*, which is published three times a year; *WPI Research*, an annual publication that reports on leading research initiatives at WPI; an online news publication called *WPI Connection*, which is published daily; and the *President's Report*, an annual publication that reports on the financial performance of the Institute. Copies of all recent publications are available in the Workroom.

WPI's Alumni Association publishes a monthly electronic newsletter for WPI alumni, *The Bridge*, and the WPI Development Office publishes *The Hill*, a print newsletter that reports on philanthropic initiatives and successes.

An annual report by the Career Development Center (CDC) includes statistics on job placement, summer internships, cooperative education, top hiring employers, average salaries by major, and so on. Some of the data are included in the Student Success form in the Appendix to this Self-Study. Examples of many of the kinds of documentation for WPI's claims and promises are on file in the Workroom.

⁴ Accessible at www.wpi.edu/admissions.

⁵ Accessible at www.wpi.edu/admissions/undergraduate/viewbook.

⁶ Accessible at www.wpi.edu/admissions/undergraduate/tour/.

Marketing and Communications updates directory listings of and for all employees and students, for the Board of Trustees, and for all academic and program advisory boards, once each year. A searchable campus directory⁷ is available on the Web, including a directory of faculty research, teaching, and project advising interests, which is updated more frequently.

The Dean of Student Office publishes the *Student Planner and Resource Guide* annually. It includes key dates on WPI's academic and social calendars, a campus map, and a listing of cultural organizations, services, and recreational opportunities in the Worcester community. It also contains the WPI Code of Conduct and a description of WPI's campus judicial system and procedures for the Campus Hearing Board.

Several internal review and proofreading processes are in place to ensure that text and illustrations used in print and online are accurate, that they are in concert with the university's published mission and goal statements, that they are consistent with the content of the undergraduate and graduate catalogs, and that the messages and descriptions and characteristics of WPI and its programs presented to prospective students are accurate and consistent.

Media Relations and Public Information

In addition to printed publications, the Marketing and Communication Division acts as the university's media relations and public information office. As such, it responds to general requests for information about the university, gathering information from or referring queries to other offices, as appropriate. It sends news releases and advisories to a wide range of newspapers, magazines and journals, broadcast news operations, and online media. Internal review and proofreading procedures are carefully observed to assure the accuracy and currency of all material distributed to the public and the news media.⁸ WPI's public relations department has fulfilled the university's responsibility to publicize the Commission on Higher Education's review of WPI prior to the commission's visit. A *Call for Public Comment*, included at the end of this section of the self-study, was distributed to the local media, to the WPI student newspaper, and distributed to WPI alumni through the alumni publication, *The Bridge*.

The WPI Homepage: www.wpi.edu

WPI's public website, which can be accessed at <http://www.wpi.edu>, is the electronic representation of the university and among its most visible recruiting tools. The site aims to reflect the university's purpose and standards with a consistent look, user-friendly navigation, and accurate information. The tone, style and manner are tailored specifically for delivery on the Web. The site also serves many important operational functions, providing a way for administrative offices and academic departments to deliver information and services to students.

WPI publishes information to the website using the Open Text content management system (CMS), the Wordpress platform, and other web development tools. The WPI homepage includes news items, event listings, and program highlights, and it has the ability to display urgent notices when needed.

The homepage and the top layer of the site provide introductory information, imagery, and videos for prospective undergraduate and graduate students and the general public under the sections labeled Academics, Research, Admissions, Campus Life, Athletics, and About WPI, with each area providing links to more detailed resources. For specific audiences, landing pages aimed at students, parents, alumni, news media, and corporate partners provide links to frequently used web resources.

⁷ All campus directories are linked to www.wpi.edu/directories

⁸ News releases, media advisories, and event information may be found on the Web at www.wpi.edu/News.

The News section of the website includes current news releases and an archive of news back to 1995. News and announcements for the campus community are published in WPI Connection⁹.

The websites of the Office of the President and the Board of Trustees include information about the institution including a downloadable copy of the latest *President's Report*, a listing of current and former trustees, and listings of administrative officers and advisory boards.

WPI's standard web template includes contact information specific to each website, in addition to institutional contact information in the footer of every page. In addition, the Directories section of the website¹⁰ includes links to an employee directory, a faculty directory, and department contact information. The directory search tool also provides restricted access to student contact information, taking into account students' privacy preferences.

Through the CMS, each academic department, interdisciplinary program, and administrative office has control over the content displayed on its website. Access is restricted to trained CMS editors, and all content must be approved by the department's designated approver before being published to the live website.

Appraisal and Projection

The demand for print versions of the catalogs has dropped in recent years with audiences turning immediately to the web and online versions. While there is not a plan to eliminate the print version entirely, and the online version of the catalog will be maintained, such a change has been discussed.

WPI is in the process of improving marketing communications through the implementation of consistent branding guidelines across campus. Historically, the responsibility for creating marketing materials for campus initiatives has fallen to the individual groups responsible for the initiatives. In order to make our outreach more consistent and organized, Marketing and Communications now supports all of these initiatives.

In 2010, WPI commissioned an outside research firm to evaluate WPI's presence in the market, with alumni, prospective students, and current students. Based on that research, we engaged a branding agency to assist with the refinement of our brand positioning and strategy. Currently we are in the process of implementing the recommendations through the creation of branding guidelines, policies, and procedures.

⁹ www.wpi.edu/connection/.

¹⁰ www.wpi.edu/directories/.



100 Institute Road
Worcester, MA 01609
www.wpi.edu

Contact: Eileen Brangan Mell
508-831-6785; ebmell@wpi.edu

Public Input Sought on WPI Accreditation by New England Association of Schools and Colleges

Worcester, Mass. – January 18, 2012 – Worcester Polytechnic Institute will undergo a comprehensive evaluation visit by this fall by a team representing the Commission on the Institutions of Higher Education of the New England Association of Schools and Colleges. The public is invited to submit comments about WPI until March 21, 2012.

The commission is one of eight nationwide that provide institutional accreditation on a regional basis. It accredits about 200 institutions in New England. The commission team will visit WPI between March 18 and March 21 and recommend to the full commission whether to continue the University's accreditation; after the review, the commission itself will take the final action. Seeking accreditation is voluntary.

WPI has been accredited by the commission since 1937 and was last reviewed in 2001. NEASC accreditation covers the entire institution.

For more than a year, WPI has been engaged in a self-study, addressing the commission's standards for accreditation. The evaluation team will gather evidence that the self-study is thorough and accurate.

The public is invited to submit written comments on substantive matters relating to the quality of the University or its academic programs. Written, signed comments must be received by March 21, 2012 and should include the name, address, and phone number of the person submitting comments. They should be sent to: *Public Comments on Worcester Polytechnic Institute, Commission on Institutions of Higher Education, New England Association of Schools and Colleges, 209 Burlington Road, Bedford, MA 01730-1433*, or via email to cihe@neasc.org.

About Worcester Polytechnic Institute

Founded in 1865 in Worcester, Mass., WPI was one of the nation's first engineering and technology universities. Its 13 academic departments and School of Business offer more than 50 undergraduate and graduate degree programs in science, engineering, technology, business, the social sciences, and the humanities and arts, leading to bachelor's, master's and PhD degrees. WPI's world-class faculty work with students in a number of cutting-edge research areas, leading to breakthroughs and innovations in such fields as biotechnology, fuel cells, information security, materials processing, and nanotechnology. Students also have the opportunity to make a difference to communities and organizations around the world through the university's innovative Global Perspective Program. There are more than 25 WPI project centers throughout North America and Central America, Africa, Australia, Asia, and Europe.

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Standard 10: Public Disclosure

Information	Web addresses	Print Publications
How can inquiries be made about the institution? Where can questions be addressed?	http://www.wpi.edu/about/web/feedback.html	
Notice of availability of publications and of audited financial statement or fair summary	http://www.wpi.edu/offices/president/2010presidents-report.html	President's Annual Report and Financial Statements
Institutional catalog	http://www.wpi.edu/academics/catalogs/ugradcurrent.html	Undergraduate Catalog
Obligations and responsibilities of students and the institution	http://www.wpi.edu/academics/catalogs/ugrad/course-descriptions.html	Section 3 of the Undergraduate Catalog
	http://www.wpi.edu/academics/catalogs/ugrad/practices.html	Student Planner
Information on admission and attendance	http://www.wpi.edu/Images/CMS/InstitutionalResearch/Factbook_2011(1).pdf	2011 Student Factbook
Institutional mission and objectives	http://www.wpi.edu/about/mission.html	Introduction to the Undergraduate Catalog
	http://www.wpi.edu/academics/catalogs/ugrad/mission.html	
Expected educational outcomes	http://www.wpi.edu/offices/policies/outcomes.html	Undergraduate Catalog
	http://www.wpi.edu/academics/catalogs/ugrad/outcomes.html	
Requirements, procedures and policies re: admissions	http://www.wpi.edu/admissions/undergraduate/apply/requirements.html	
	http://www.wpi.edu/admissions/undergraduate/apply/appl-process.html	
Requirements, procedures and policies re: transfer credit	http://www.wpi.edu/offices/registrar/transfer-credit.html	
	http://www.wpi.edu/academics/catalogs/ugrad/transferecredit.html	
	http://www.wpi.edu/admissions/undergraduate/apply/apply-transfercredit.html	
	http://www.wpi.edu/admissions/undergraduate/apply/transfer-credit.html	
Student fees, charges and refund policies	http://www.wpi.edu/offices/acc/refund.html	Undergraduate Catalog and Graduate Catalog
	http://www.wpi.edu/offices/acc/tuition.html	
Rules and regulations for student conduct	http://www.wpi.edu/offices/policies.html	
Other information re: attending or withdrawing from the institution	http://www.wpi.edu/offices/registrar/withdrawal.html	
Academic programs	http://www.wpi.edu/admissions/undergraduate/academics/areas.html	Undergraduate Catalog and Graduate Catalog
	http://www.wpi.edu/admissions/graduate/programs.html	
Courses currently offered	http://www.wpi.edu/offices/registrar/schedules.html	Undergraduate Catalog and Graduate Catalog
Other available educational opportunities: Global Perspective Program	http://www.wpi.edu/academics/GPP/index.html	
Other academic policies and procedures		

Standard 10: Public Disclosure

Information	Web addresses	Print Publications
Requirements for degrees and other forms of academic recognition	http://www.wpi.edu/academics/catalogs/ugrad/require.html http://www.wpi.edu/admissions/undergraduate/academics/grad-requirements.html http://www.wpi.edu/academics/catalogs/ugrad/gradhonors.html	Undergraduate and Graduate Catalogs
List of current faculty, indicating department or program affiliation, distinguishing between full- and part-time, showing degrees held and institutions granting them	http://www.wpi.edu/academics/facultydir/afas_dept.html http://www.wpi.edu/academics/facultydir/bbt_dept.html http://www.wpi.edu/academics/facultydir/bme_dept.html http://www.wpi.edu/academics/facultydir/cme_dept.html http://www.wpi.edu/academics/facultydir/cbc_dept.html http://www.wpi.edu/academics/facultydir/cee_dept.html http://www.wpi.edu/academics/facultydir/cs_dept.html http://www.wpi.edu/academics/facultydir/ece_dept.html http://www.wpi.edu/academics/facultydir/fpe_dept.html http://www.wpi.edu/academics/facultydir/hua_dept.html http://www.wpi.edu/academics/facultydir/igs_dept.html http://www.wpi.edu/academics/facultydir/ma_dept.html http://www.wpi.edu/academics/facultydir/me_dept.html http://www.wpi.edu/academics/facultydir/ms_dept.html http://www.wpi.edu/academics/facultydir/pe_dept.html http://www.wpi.edu/academics/facultydir/ph_dept.html http://www.wpi.edu/academics/facultydir/mgt_dept.html http://www.wpi.edu/academics/facultydir/ssps_dept.html	
Names and positions of administrative officers	http://www.wpi.edu/directories/employees.html	
Names and principal affiliations of members of the governing board	http://www.wpi.edu/offices/trustees/current.html	Undergraduate Catalog, Section 8
Locations and programs available at branch campuses, other instructional locations, and overseas operations at which students can enroll for a degree, along with a description of programs and services available at each location	http://www.wpi.edu/academics/catalogs/ugrad/consortium.html http://www.wpi.edu/academics/catalogs/ugrad/studentexchange.html http://www.wpi.edu/academics/GPP/index.html	
Programs, courses, services, and personnel not available in any given academic year.		
Size and characteristics of the student body	http://www.wpi.edu/About/facts.html	
Description of the campus setting	http://www.wpi.edu/about/visitors/campusmap.html http://www.wpi.edu/about/visitors.html	
Availability of academic and other support services	http://www.wpi.edu/offices/arc.html	

Standard 10: Public Disclosure

Information	Web addresses	Print Publications
Range of co-curricular and non-academic opportunities available to students	http://www.wpi.edu/offices/sao/clubs.html	
	http://www.wpi.edu/offices/sao.html	
Institutional learning and physical resources from which a student can reasonably be expected to benefit		
Institutional goals for students' education	http://www.wpi.edu/about/mission.html http://www.wpi.edu/academics/catalogs/ugrad/outcomes.html http://www.wpi.edu/academics/catalogs/ugrad/goal.html	Undergraduate Course Catalog
Success of students in achieving institutional goals including rates of retention and graduation and other measure of student success appropriate to institutional mission. Passage rates for licensure exams, as appropriate	http://www.wpi.edu/offices/ir/enrollment-data.html http://www.wpi.edu/offices/ir/student-retention.html	WPI participates in the CSRDE (http://csrde.ou.edu/web/consortium.html) and annually provides retention and graduation data by gender and ethnicity for our undergraduate population. Retention and graduation rates can also be found in the WPI Factbooks.
Total cost of education, including availability of financial aid and typical length of study	http://www.wpi.edu/Admin/FA/First/fytuition.html http://www.wpi.edu/Admin/FA/Returning/ugradtuition.html http://www.wpi.edu/Admin/FA/Grad/gradtuition.html http://www.wpi.edu/Admin/FA/International/intltuition.html http://www.wpi.edu/Admin/FA/First/fytypes.html	Undergraduate Catalog, Section 7: Admission, Expenses, Financial Aid, and Housing.
Expected amount of student debt upon graduation	http://www.wpi.edu/Admin/FA/First/fylinks.html	
Statement about accreditation	http://www.wpi.edu/about/accreditation.html http://www.wpi.edu/admissions/undergraduate/academics/accreditation.html	
The WPI Common Data Set (http://www.wpi.edu/offices/ir/data-set.html) contains useful enrollment breakdowns, graduation and retention rates, admissions data, student financial aid and faculty characteristics that provide information for many of these categories.		
Another place to find facts and figures is located here: http://www.wpi.edu/about/facts.html		

Standard Eleven: Integrity

Integrity is a fundamental requirement for learning and a necessary foundation for all academic institutions. WPI uses every opportunity to discuss and disseminate the policies and procedures that embody our commitment to honesty, integrity, fairness, and inclusiveness. WPI's Undergraduate Learning Outcomes specify "personal, societal, and professional ethical standards" as one of the fundamental goals of a WPI education. The Core Values of the Student Affairs Division highlight *inclusiveness* (providing a voice to multiple viewpoints and promoting a culture of civility), along with *citizenship* (promoting integrity, leadership, personal responsibility, and global perspective). WPI maintains high standards of integrity through open and interactive communications within the university community, while maintaining legal and ethical standards of privacy and fairness.

Admissions and financial policies are stated in the undergraduate and graduate catalogs and reviewed annually for validity and currency. Section 8 of the undergraduate catalog includes these important statements: *Notice of Nondiscriminatory Policy to Students*, *Student Responsibilities for Ethical and Professional Conduct*, and *Student Absence Due to Religious Beliefs* policy. Likewise, all academic policies related to academic status and appeals, privacy and release of student information, grades, and grade appeal procedures are included in both the print and online versions of the catalogs. Policies covering refunds of tuition, room and board, and financial aid are also described in the catalogs and on the Registrar's website.

The Office of the Registrar maintains and implements WPI's interpretation of the Family Education Rights and Privacy Act (FERPA). Policies protecting student privacy regarding disabilities are developed jointly with the Assistant Dean for Student Development and the Director of Disability Services.

Expectations for student conduct, particularly academic honesty, and procedures for the campus hearing board, are presented in the Student Planner and Resource Guide and the undergraduate catalog. Special presentations describing the policies are made during New Student Orientation, New Faculty Orientation, and special workshops during the academic year. The Dean of Students distributes a comprehensive summary of Academic Honesty statistics each year, along with a copy of the Academic Integrity Guide for Faculty, to all Department Heads and faculty.

WPI explicitly guarantees academic freedom to all faculty, tenure-track and non-tenure-track. Faculty members who believe their academic freedom has been violated have access to the Committee on Tenure and Academic Freedom, which is charged in the Faculty Constitution with dealing with such issues. The faculty governance system is detailed in the Faculty Handbook¹ and published on the WPI website.

The Policies and Benefits Manual² details policies and procedures affecting all employees, and is distributed to all new employees during orientation workshops. All WPI employees have access to up-to-date statements of their benefits. WPI provides a campus ombudsman³ to help faculty, students and staff deal with any issues and conflicts that may arise. The office is independent from all other offices on campus; it is an impartial, safe, and a confidential way to help individuals deal with concerns. The office also provides assistance with complaints involving interpersonal, academic, and administrative misunderstandings or disputes, and works to help individuals resolve their concerns fairly. The ombudsman is authorized by the President to confidentially receive complaints or inquiries about alleged acts, omissions, improprieties, or broader systemic problems within the WPI community.

1 Available at www.wpi.edu/Images/CMS/Campus-Faculty/handbook2005.pdf.

2 Available at www.wpi.edu/Admin/HR/BenMan/.

3 Available at www.wpi.edu/offices/ombuds/about.html.

WPI has selected EthicsPoint to implement its Whistleblower Policy. This provides employees and students with simple, risk-free ways to report activities that may involve unethical or otherwise inappropriate activity. The policy and procedures are posted at many locations on the WPI website, including the Accounting Office site for students and parents⁴ and the President's Business Ethics page.⁵ All reports submitted are given careful attention by the appropriate administrators with the objective of correcting the situation being reported.

The following WPI offices have committed to adhering to the standards of their respective professional organizations: Academic Advising, Undergraduate and Graduate Admissions, Academic Affairs (ethics in research, animal care), Development and Alumni Relations (model standards of practice of the National Committee on Planned Giving), and Student Affairs. The Provost circulates WPI's policy statements on the use of human subjects in experiments each year. The President annually circulates to the campus community the statement required by law titled, "Sexual Harassment Education and Training in the Workplace." All WPI employees must complete an online course that provides education and information related to workplace harassment.

Research and intellectual property policies are addressed in the Faculty Handbook. In addition, the intellectual property policy and related materials used to negotiate project support are available in a variety of documents made available by the Projects and Registrar's Office. The Office of Sponsored Programs offers a regular schedule of workshops and publishes an extensive list of resources on its website,⁶ including information on WPI's Institutional Review Board (created in 2002), research accounting, and resources for training in the responsible conduct of research.

WPI is committed to the principles of equal opportunity for all persons. New job positions are posted internally and advertised externally in appropriate media, with special attention given to publications aimed at audiences of minorities and women. WPI affirmatively seeks, employs, and promotes the best-qualified persons without regard to race, sex, age, color, national origin, religion, handicap, veteran's status, or sexual orientation. The President's Council for the Support of Women and Minorities at WPI promotes and oversees the successful recruitment, retention, support, development, and advancement of women and members of underrepresented minorities in the WPI faculty, staff, and student body. The Council fulfills its purpose by

- reviewing and developing relevant policies;
- setting realistic goals in the related areas;
- assuring appropriate financial and administrative support for purpose and goals;
- assessing progress against the goals; and
- soliciting input from the campus community on all aspects of its purpose.

The Provost's Office, in collaboration with the Human Resources Division, has recently completed a new handbook, *Faculty Search Guidelines*, that is reviewed by all search committees at the start of the search process.

Employees, students, and others who act on behalf of WPI are expected to follow the WPI "Equal Employment Opportunity and Affirmative Action Policy."⁷ As a regular practice, the Human Resources Office follows federal guidelines for reporting race and ethnicity as well as the percentage of underrepresented employees at WPI as compared to available pools locally and nationally. The public may review these documents by requesting them or by visiting WPI or its website.

4 Available at www.wpi.edu/offices/acc/studentparents.html.

5 Available at www.wpi.edu/offices/president/business-ethics.html.

6 Available at www.wpi.edu/offices/osp.html.

7. Available at www.wpi.edu/Admin/HR/BenMan/equal.html.

Each group of stakeholders at WPI has open forums available to discuss problems that affect it. Students are represented through the undergraduate and graduate governance bodies, with voting membership on key faculty governance committees, as well as representation at meetings of the Board of Trustees. Faculty may, by WPI custom, raise any issue on the floor of the monthly faculty meetings under the standing agenda item, “New Business”. Faculty members may also initiate discussion of any issue they deem important through the formal faculty governance system. The Board of Trustees is ultimately accountable to the Commonwealth of Massachusetts for its stewardship of WPI resources and for carrying out the educational and scholarly mission of the university.

Projection

The extent of training sessions for various members of the WPI community on diversity issues, generally, and affirmative action, specifically, varies widely. Generally, WPI has done well over the last 10 years—and especially during the last five years—in increasing the diversity of all constituencies on campus. For example, through extensive focused recruiting efforts, WPI has increased the percentage of women employees from 40 percent to 46 percent over the past five years. The percentage of minorities has increased in almost all areas. Female students now make up 31 percent of the undergraduate population.

The administration and the faculty Committee on Governance have been working to update WPI’s policies on research misconduct, sexual harassment, and general faculty misconduct. We do not have clear procedures or a clear system of sanctions, short of removal of tenure, at this time and the new policy will serve to fill this gap.

Standard 11: Integrity							
Policies			Last Updated	URL where policy is posted			Responsible office or committee
Academy honesty			Unknown	www.wpi.edu/offices/policies/honesty/policy.html			Dean of Students Office
Intellectual property rights			May 16, 1996	www.wpi.edu/offices/policies/intell.html			Vice Provost for Research
Conflict of interest			Jan 30, 2003	www.wpi.edu/offices/policies/conflict.html			Provost's Office
Privacy rights			Apr 8, 2011	www.wpi.edu/offices/policies/ferpa.html			Office of the Registrar
Fairness for students			-----	-----			-----
Fairness for faculty			-----	-----			-----
Fairness for staff			-----	-----			-----
Academic freedom			Oct 7, 2010	https://www.wpi.edu/Images/CMS/FacultyGov/Faculty_Handbook_10-07-10.pdf			Provost's Office and the Committee on Tenure and Academic Freedom
Whistle Blower			Unknown	https://secure.ethicspoint.com/domain/en/report_custom.asp?clientid=20475			President's Office
Non-discrimination policies							
Recruitment and admissions				http://www.wpi.edu/Admin/HR/BenMan/nondis411.html			Office of Human Resources
Employment				http://www.wpi.edu/Admin/HR/BenMan/atwill.html			Office of Human Resources
Evaluation				http://www.wpi.edu/Admin/HR/BenMan/appraisal.html			Office of Human Resources
Disciplinary action				http://www.wpi.edu/Admin/HR/BenMan/behavior.html			Office of Human Resources
Advancement				http://www.wpi.edu/Admin/HR/BenMan/promotions.html			Office of Human Resources
Resolution of grievances							
Students			Jan 12, 2012	www.wpi.edu/academics/catalogs/ugrad/gradeappeal.html			Individual Departments and the Committee on Academic Operations (CAO)
Faculty			Unknown	www.wpi.edu/Admin/HR/BenMan/grievance.html			Office of Human Resources
Staff			Unknown	www.wpi.edu/Admin/HR/BenMan/grievance.html			Office of Human Resources
Other: Faculty, Staff, and Students			Unknown	www.wpi.edu/offices/ombuds/about.html			Office of the Ombuds

Appendix

Affirmation of Compliance



NEW ENGLAND ASSOCIATION OF SCHOOLS AND COLLEGES
COMMISSION ON INSTITUTIONS OF HIGHER EDUCATION

209 Burlington Road, Bedford, MA 01730

Voice: (781) 271-0022 Fax: (781) 271-0950 Web: <http://cihe.neasc.org>

AFFIRMATION OF COMPLIANCE WITH FEDERAL REGULATIONS RELATING TO TITLE IV

Periodically, member institutions are asked to affirm their compliance with federal requirements relating to Title IV program participation, including relevant requirements of the Higher Education Opportunity Act.

1. **Credit Transfer Policies.** The institution's policy on transfer of credit is publicly disclosed through its website and other relevant publications. The institution includes a statement of its criteria for transfer of credit earned at another institution of higher education along with a list of institutions with which it has articulation agreements. (CIHE Policy 95. See also *Standards for Accreditation* 4.44 and 10.5.)

URL	www.wpi.edu/admissions/undergraduate/apply/transfer-credit.html
Print Publications	Undergraduate Catalog and Graduate Catalog

2. **Public Notification of an Evaluation Visit and Opportunity for Public Comment:** The institution has made an appropriate and timely effort to notify the public of an upcoming comprehensive evaluation and to solicit comments. (CIHE Policy 77.)

URL	www.wpi.edu/news/20112/neasc.html
Print Publications	Worcester Telegram and Gazette, WPI Student Newspaper, Alumni (January 2012)

3. **Student Complaints.** "Policies on student rights and responsibilities, including grievance procedures, are clearly stated, well publicized and readily available, and fairly and consistently administered." (*Standards for Accreditation* 6.18, 10.5, and 11.8.)

URL	Judicial Policy: www.wpi.edu/offices/policies/process.html Student Conduct: www.wpi.edu/Images/CMS/SL/Policy_Section_2010-11.pdf Ombudsman: www.wpi.edu/offices/ombuds/about.html
Print Publications	Undergraduate Catalog, Student Guide to Academic Integrity, Campus Planner and Resource Guide

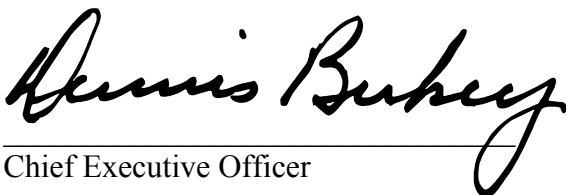
4. **Distance and Correspondence Education: Verification of Student Identity:** If the institution offers distance education or correspondence education, it has processes in place to establish that the student who registers in a distance education or correspondence education course or program is the same student who participates in and completes the program and receives the academic credit. . . . The institution protects student privacy and notifies students at the time of registration or enrollment of any projected additional student charges associated with the verification of student identity. (CIHE Policy 95. See also *Standards for Accreditation* 4.42.)

Method(s) used for verification	All distance education academic work is done through the university's learning management system, myWPI. Each student has a password protected login to the online course site for all courses in which they are enrolled.
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5. **Credit Hour:** Federal regulation defines a credit hour as an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutional established equivalence that reasonably approximates not less than: (1) One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours. (CIHE Policy 111. See also *Standards for Accreditation* 4.34.)

Institutional policies and procedures for determining the credit hours awarded	The faculty expectation for course and project work, published in the Undergraduate Catalog, is 15-17 hours per week for all activities related to a 7-week course or project. This equates to between 105 and 119 total hours of effort for 3 credits of activity. Course reports collected at the end of every class in every term ask students to report time-on-task and these data are reviewed by faculty and administration twice each year.
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The undersigned affirms that Worcester Polytechnic Institute meets the above federal requirements relating to Title IV program participation, including those enumerated above.



Chief Executive Officer

2/1/2012

Date

Appendix

Forms on Student Achievement and Success

E1: PART A. INVENTORY OF EDUCATIONAL EFFECTIVENESS INDICATORS FOR THE INSTITUTION

CATEGORY	(1) Have formal learning outcomes been developed ?	(2) Where are these learning outcomes published? (please specify) Include URLs where appropriate.	(3) Other than GPA, what data/evidence is used to determine that graduates have achieved the stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)	(4) Who interprets the evidence? What is the process? (e.g. annually by the curriculum committee)	(5) What changes have been made as a result of using the data/evidence?	(6) Date of most recent program review (for general education and each degree program)
Great Problems Seminars	Yes	Catalog and on the web at www.wpi.edu/+FYE	Project Reviews at Project Presentation Day	Associate Dean		Assessment each year
Humanities and Arts: Inquiry Seminar and Practicum	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/humanities.html	Assessment program under development	Department Head		
Interactive Qualifying Project	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/interdisciplinary.html	Review of Project Reports	Dean of IGSD		External Review in 2009
Major Qualifying Project	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/disciplinary.html	Departmental review of Project Reports	Department Heads and Dean of Undergraduate Studies		Selected program each summer

E1: PART A. INVENTORY OF EDUCATIONAL EFFECTIVENESS INDICATORS FOR ARTS & SCIENCES

CATEGORY	(1) Have formal learning outcomes been developed ?	(2) Where are these learning outcomes published? (please specify) Include URLs where appropriate.	(3) Other than GPA, what data/evidence is used to determine that graduates have achieved the stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)	(4) Who interprets the evidence? What is the process? (e.g. annually by the curriculum committee)	(5) What changes have been made as a result of using the data/evidence?	(6) Date of most recent program review (for general education and each degree program)
Actuarial Mathematics	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; Actuarial Exams	Director of Actuarial Program, Department Head	Course changes made to reflect changes in the SOA exam structure	
Biology and Biotechnology	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; Course-based assessment	Associate Department Head, Calculus Committee, Undergraduate Committee	New Mathematics Core	
Chemistry and Biochemistry	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; Senior Exit Survey	DH, Program Review Committee	New curricular tools for recognizing chemical hazards	External Review 2009
Bioinformatics and Computational Biology	Yes	Catalog and on the web at http://www.wpi.edu/academics/catalogs/ugrad/bcbdept.html			Program established in AY2011-12	
Computer Science	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; Course-based assessment	DH, Program Review Committee	Many course changes; six recommendations for MQP advisors	ABET 2009
Economic Science	Yes	Part of Social Science & Policy Studies, in catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	MQP Review; Student Course Reports	DH, Annual Faculty Retreats	Involving students in reconstructing the major	

Environmental and Sustainability Studies (BA)	Yes	Catalog and on the web at www.wpi.edu/Pubs/Catalogs/UGrad/Current/evsdept.html	MQP Review; IQP Review; Course-based assessment	Program Director	Program launched April, 2008; name changed in 2011	
Humanities and Arts	No	Under Development		DH, Program Review Committee		
Interactive Media and Game Development	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	MQP Review; Project presentation day; Course-based assessment	Program Director and IMGD Steering Committee		Advisory Board annual
International Studies	No			Program Director		
Liberal Arts and Engineering (BA)	Yes	Catalog and on the web at http://www.wpi.edu/academics/catalogs/ugrad/laeddept.html		Program Director		
Mathematical Sciences	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Standard Tests, Project Presentation Day; MQP Review	Program Review Committee,		
Physics and Engineering Physics	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review	DH, Program Review Committee	“Best practices” resource for MQP students; Improvements in first year labs	
Psychological Science	Yes	Part of Social Science & Policy Studies, in catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	MQP Review; Student Course Reports	DH, Annual Faculty Retreats		
Society, Technology and Policy	Yes	Part of Social Science & Policy Studies, in catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	MQP Review; Student Course Reports	DH, Annual Faculty Retreats		
System Dynamics	Yes	Part of Social Science & Policy Studies, in catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	MQP Review; Student Course Reports	DH, Annual Faculty Retreats		

OPTION E1: PART B. INVENTORY OF ARTS & SCIENCES ACCREDITATION

(1) Professional, specialized, State, or programmatic accreditations currently held by the institution (by agency or program name).	(2) Date of most recent accreditation action by each listed agency.	(3) List key issues for continuing accreditation identified in accreditation action letter or report.	(4) Key performance indicators as required by agency or selected by program (licensure, board, or bar pass rates; employment rates, etc.). *	(6) Date and nature of next scheduled review.
Computer Science	ABET 2009	Recommended an increased use of assessments of student work in program review; additional required course in computer architecture.	Learning Outcomes; 89% placement rate	2012 for interim review

E1: PART A. INVENTORY OF EDUCATIONAL EFFECTIVENESS INDICATORS BUSINESS

CATEGORY	(1) Have formal learning outcomes been developed?	(2) Where are these learning outcomes published? (please specify) Include URLs where appropriate.	(3) Other than GPA, what data/evidence is used to determine that graduates have achieved the stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)	(4) Who interprets the evidence? What is the process? (e.g. annually by the curriculum committee)	(5) What changes have been made as a result of using the data/evidence?	(6) Date of most recent program review (for general education and each degree program)
Industrial Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review	Dean, Program Director, Program Review Committee		2009 by ABET
Management	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review	Dean and PRC	Restructure entire UG program in 2010	AACSB 2006
Management Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review	Dean and PRC		AACSB 2006
Management Information Systems	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review	Dean, Program Director, PRC		AACSB 2006

E1: PART B. INVENTORY OF BUSINESS ACCREDITATION

(1) Professional, specialized, State, or programmatic accreditations currently held by the institution (by agency or program name).	(2) Date of most recent accreditation action by each listed agency.	(3) List key issues for continuing accreditation identified in accreditation action letter or report.	(4) Key performance indicators as required by agency or selected by program (licensure, board, or bar pass rates; employment rates, etc.). *	(6) Date and nature of next scheduled review.
Industrial Engineering	ABET 2009	Recommended increased focus on the use of feedback in MQP and course assessment.	Learning Outcomes; Placement 88%	2015 for Regular Review
Management	AACSB	No issues were identified that required action.	Learning Outcomes; Placement from 81% to 100%	2012 for Regular Review

E1: PART A. INVENTORY OF EDUCATIONAL EFFECTIVENESS INDICATORS FOR ENGINEERING

CATEGORY	(1) Have formal learning outcomes been developed ?	(2) Where are these learning outcomes published? (please specify) Include URLs where appropriate.	(3) Other than GPA, what data/evidence is used to determine that graduates have achieved the stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)	(4) Who interprets the evidence? What is the process? (e.g. annually by the curriculum committee)	(5) What changes have been made as a result of using the data/evidence?	(6) Date of most recent program review (for general education and each degree program)
Aerospace Engineering	Yes	Catalog and on the web at http://www.me.wpi.edu/Aero/undergrad.html	Annual Project Presentation Day; MQP Review; IQP Review; Course-based assessment	Program Director; AE Program Committee	Restructured distribution requirements for Aero and Astro in 2009; many course changes.	2009 by ABET
Biomedical Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; IQP Review; Course-based assessment	Department Head, BME Undergraduate Curriculum Committee	More relevant statistics and hypothesis testing in curriculum; Redesigned sophomore curriculum; Developing a design course to support off-campus MQP.	2009 by ABET
Chemical Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; Design Reports Review; IQP Review	Department Head, CHE Undergraduate Committee	New first year intro course and new biology requirement; increased emphasis on ethical and professional responsibility in multiple courses.	2009 by ABET
Civil Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; IQP Review; Course-based assessment	Department Head, CEE Curriculum Assessment Committee	Adopted new program objectives in 11/2008. New course in sustainable design. Integrated software applications in curriculum.	2009 by ABET
Environmental Engineering	Yes	Catalog and on the web at http://www.wpi.edu/Academics/Majors/EVE/academics.html	Annual Project Presentation Day; MQP Review; IQP Review; Course-based assessment	Program Director, EVE Associated Faculty and Advisory Board	Modified Advanced Science requirement	2009 by ABET

Industrial Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; IQP Review; Course-based assessment	Program Director, IE Core Faculty; Board of Advisors	Added design reflection in MQP reports.	2009 by ABET
Mechanical Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Outcomes/deptstatements.html	Annual Project Presentation Day; MQP Review; IQP Review; course-based assessment	Department Head, ME Program Committee	Established software applications training; Created MQP opportunities website.	2009 by ABET
Robotics Engineering	Yes	Catalog and on the web at www.wpi.edu/academics/Majors/RBE/academics.html	Annual Project Presentation Day; MQP Review	Department Head, RBE Program Review Committee	Restructured core sequence in Unified Robotics	2010 by ABET

E1: PART B. INVENTORY OF ENGINEERING ACCREDITATION

(1) Professional, specialized, State, or programmatic accreditations currently held by the institution (by agency or program name).	(2) Date of most recent accreditation action by each listed agency.	(3) List key issues for continuing accreditation identified in accreditation action letter or report.	(4) Key performance indicators as required by agency or selected by program (licensure, board, or bar pass rates; employment rates, etc.). *	(6) Date and nature of next scheduled review.
Aerospace Engineering	ABET 2009	Added structure in advanced courses or focus areas in Aeronautical and Astronautical Engineering	Assessment focus on Program Learning Outcomes	2015 for Regular Review
Biomedical Engineering	ABET 2009	The report expressed a concern regarding the increase in the student-to-faculty ratio in BME.	Learning Outcomes	2015 for Regular Review
Chemical Engineering	ABET 2009	The report expressed concern regarding student-to-faculty ratio in Chemical Engineering; increase opportunities for student to learn process control.	Learning Outcomes	2015 for Regular Review
Civil Engineering	ABET 2009	Recommended and additional science course requirement.	Learning Outcomes	2015 for Regular Review
Electrical and Computer Engineering	ABET 2009	No issues or concerns identified.	Learning Outcomes	2015 for Regular Review
Environmental Engineering	ABET 2009	No issues or concerns identified.	Learning Outcomes	2015 for Regular Review
Mechanical Engineering	ABET 2009	No issues or concerns identified.	Learning Outcomes	2015 for Regular Review
Robotics Engineering	ABET 2009	Recommended decreased emphasis on team-based project work for assessment. The visiting committee was also concerned that the program was too flexible.	Learning Outcomes	2012 for Regular Review

Form S1. RETENTION AND GRADUATION RATES						
Student Success Measures/ Prior Performance and Goals	2 Years Prior	1 Year Prior	Most Recent Year	Goal Next Year	Goal 2 Years Forward	
IPEDS Retention Data						
Associate degree students						
Bachelors degree students	93%	95%	95%	95%	95%	
IPEDS Graduation Data						
Associate degree students						
Bachelors degree students	79%	80%	80%	80%	80%	
Other Undergraduate Retention Rates (1)						
a						
b						
c						
Other Undergraduate Graduation Rates (2)						
a	4-yr Graduation Rates	69%	68%	72%	70%	70%
b						
c						
Graduate programs *						
	Retention rates first-to-second year (3)	89%	89%	88%	89%	89%
	Graduation rates @ 150% time (4)	80%	86%	89%	85%	85%
Distance Education						
	Course completion rates (5)					
	Retention rates (6)					
	Graduation rates (7)					
Branch Campus and Instructional Locations						
	Course completion rate (8)					
	Retention rates (9)					
	Graduation rates (10)					
Definition and Methodology Explanations						
1						
2	4-yr graduation rate based on IPEDS data					
3	% of fall-entering Masters & PhD students, FT and PT, who returned or graduated by the following fall					
4	% of fall-entering, FT Masters students who completed in 3 yrs or less					
5						
6						
7						
8						
9						
10						
* An institution offering graduate degrees must complete this portion.						

"Goal" years are a 3-yr avg

Form S3. LICENSURE PASSAGE AND JOB PLACEMENT RATES

		2 Years Prior	1 Year Prior	Most Recent Year	Goal Next Year	Goal 2 Years Forward
State Licensure Passage Rates *						
1	Massachusetts Test for Education Licensure	100%	100%	100%	100%	100%
National Licensure Passage Rates *						
1	Civil Engineering: Professional Eng Exams	NA	NA	78%	100%	100%
Job Placement Rates**						
	Major	2008	2009	2010	2011	2012
1	Aerospace Engineering	100%	85%	92%	100%	100%
2	Biomedical Engineering	100%	100%	100%	100%	100%
3	Chemical Engineering	100%	78%	86%	100%	100%
4	Civil Engineering	100%	83%	92%	100%	100%
5	Electrical & Computer Eng	100%	96%	93%	100%	100%
6	Environmental Engineering	100%	100%	83%	100%	100%
7	Manufacturing Engineering	100%	100%	100%	100%	100%
8	Mechanical Engineering	100%	88%	95%	100%	100%
9	Robotics Engineering	NA	100%	100%	100%	100%
10	Actuarial Mathematics	89%	89%	56%	100%	100%
11	Biochemistry	100%	100%	95%	100%	100%
12	Biology & Biotechnology	100%	91%	100%	100%	100%
13	Chemistry	100%	100%	89%	100%	100%
14	Computer Science	100%	100%	100%	100%	100%
15	Environmental Policy & Dev	NA	100%	0%	100%	100%
16	Humanities & Arts	100%	NA	100%	100%	100%
17	Interactive Media & Game Development	100%	81%	80%	100%	100%
18	Mathematical Sciences	100%	100%	67%	100%	100%
19	Physics	100%	100%	80%	100%	100%
20	Psychological Science	NA	NA	0%	100%	100%
21	Society, Technology & Policy	50%	NA	100%	100%	100%
22	System Dynamics	0%	NA	100%	100%	100%
23	Industrial Engineering	90%	100%	88%	100%	100%
24	Management	67%	100%	80%	100%	100%
25	Management Engineering	100%	73%	81%	100%	100%
26	Management Information Systems	100%	78%	100%	100%	100%
27	Economics	100%	100%	NA	100%	100%
28	International Studies	NA	100%	NA	100%	100%
29	Professional Writing	100%	100%	NA	100%	100%
30	Environmental Studies (BA)	NA	0%	NA	100%	100%
31	Interdisciplinary Studies	NA	100%	NA	100%	100%

**** Note:** All of these placement rates are based on surveys of graduating students and report the fraction of those responding who report placement 6-months after graduating. For the last few years, the response rate has been well over 80%, so these are good estimates for overall job placement of graduates.

Appendix

Supporting Documents in the Workroom

Materials Collected in the NEASC Workroom

March 18-21, 2012

Standard One: Mission and Purpose

- A. Undergraduate and Graduate Catalogs (last five years)
- B. President's Annual Reports
- C. Annual reports from organizational units

Standard Two: Planning and Evaluation

- A. Revised Strategic Plan (New Vision, New Ideas, New Resources II: A revision of the WPI Strategic Plan for FY 2000 to FY 2010 for the period FY 2008 to FY 2015)
- B. Presidential Commission Reports
 - 1. General Education and the First Year Experience
 - 2. The Fine and Liberal Arts and the Sufficiency Requirement
 - 3. The IQP and Global Studies
 - 4. Research and Graduate Education
 - 5. Faculty Workloads
 - 6. Shape and Size
 - 7. Rankings

Standard Three: Organization and Governance

- A. Board of trustees' by-laws, rules, policies.
- B. Faculty Handbook (includes the Faculty Constitution)
- C. Employee Handbook
- D. Annual Reports from Faculty Governance Committees

Standard Four: Academic Programs

- A. Description of degree programs including objectives and requirements.
 - 1. Undergraduate Catalogs
 - 2. Graduate Catalogs
 - 3. Department Annual Reports
 - 4. Program self-studies for external accreditation
- B. Reports on student learning and academic performance
 - 1. UOAC: Institutional Learning Outcomes Assessment Matrix
 - 2. Registrar's Annual Reports
 - 3. Student Course Report summaries for Department Heads and Deans
 - 4. Academic Progress Summaries for Trustees

5. Career Development Center Reports
 6. NSSE Reports
 7. EBI Reports
 8. PACE Report
 9. Wabash National Study Reports
 10. Review of the Inquiry Seminar and Practicum
- C. Course and project information
1. Sample syllabi from courses
 2. Sample IQP Reports
 3. Sample MQP Reports
 4. Annual Reports from the Interdisciplinary and Global Studies Division
 5. Programs from Project Presentation Day
 6. Programs from Graduate Research Achievement Day
 7. Programs from Great Problems Seminars presentations
- D. Examples of institutional studies of learning outcomes.
1. UOAC: Institutional Learning Outcomes Assessment Matrix
 2. IQP Reviews
 3. MQP Reviews for Academic Departments
 4. Assessment Reports for the Great Problems Seminars
 5. Self-study reports for individual program assessment
- E. Published statements on research policies and practices of the institution.
1. Sponsored Programs Handbook
 2. Faculty Handbook
 3. Institutional Review Board Policies and Procedures
 4. Report of the Office of Environmental & Occupational Safety (Laboratory Safety Training)
- F. Samples of funded research activities.
1. Research Magazine
 2. Sample faculty publication
- G. Samples of brochures, schedules, or handouts describing public-service activities of the college.
1. Colleges of Worcester Consortium Community Service Surveys
 2. NEASC report for the Massachusetts Academy of Mathematics and Science at WPI

Standard Five: Faculty

- A. Faculty governance information
1. Faculty Handbook
 2. Annual reports for faculty governance committees (also in Standard Three)
- B. Personnel policies for full-time and part-time faculty.

1. Human Resources Policies
2. Handbook for Faculty Search Committees

Standard Six: Students

- A. Copies of the charter or constitution of the student association, statement of student rights and responsibilities, student fees, student handbook, student newspaper, and other publications.
 1. Student Planner
 2. Undergraduate and Graduate Catalogs
 3. Copies of the Two Towers and the Tech Bible
 4. Program for New Student Orientation
 5. SGA Annual Report
 6. GSG Annual Report
- B. Enrollment data for most recent fall semester, if compiled and after self-study was completed.
 1. University Factbooks
 2. Registrar's Annual Report
- C. Information regarding community-service activities
 1. Dean of Students Annual Reports
 2. Student Activities Offices
 3. Greek Life Task Force Report

Standard Seven: Library and Other Information Resources

- A. Library Annual Reports
 1. Long-range plan
 2. Annual report
 3. Information Literacy Vision Statement
- B. Academic Technology Center Annual Reports

Standard Eight: Facilities and Information Technology

- A. Campus master plan and accompanying maps
- B. Information Technology equipment replacement schedules
- C. Space utilization studies

Standard Nine: Financial Resources

- A. Most recent audited financial statement

Standard Ten: Public Disclosure

- A. WPI Viewbook
- B. Magazines: *Transformations* and *WPI Research*

- C. Samples of recruiting materials

Standard Eleven: Integrity

- A. Documents pertaining to equal opportunity, affirmative action, protection of individual rights, grievance policies, and academic freedom.