

LIMITLESS OPPORTUNITY  
GLOBAL IMPACT  
PREMIER  
PROGRAM

[ FIRE PROTECTION ENGINEERING ]





## WPI—THE INTERSECTION OF THEORY AND APPLICATION

Welcome to Worcester Polytechnic Institute. An accredited university established in 1865, WPI is the third oldest technological university in the United States.

Integrating theory and practice, WPI is a magnet for industry innovators and an incubator for scientific breakthroughs.

WPI is a leader in science and engineering with faculty and alumni from around the globe. The WPI legacy is a continually expanding network of scientific resources, and leading-edge degree programs like Fire Protection Engineering.

# YOUR FIRE PROTECTION ENGINEERING CAREER PATH STARTS WITH ONE OF THE WORLD'S MOST RESPECTED DEGREE PROGRAMS



For over 30 years, WPI FPE graduates have enjoyed the benefits of the best employment opportunities in the most exciting and rewarding new areas of practice.

#### Jobs & top salaries

WPI is the first stop for a long list of industry and government employers. The 2008 median income for fire protection engineering professionals was \$101,000.

#### Paid industrial internships

Students can work as full-time fire protection engineering interns while studying for their MS. A vast array of opportunities provides students with an early career launch.

#### Exchange of ideas

Students from across the spectrum of engineering disciplines mix with professionals in a wide range of industries to create a rich educational environment. A free exchange of ideas advances science and safety.

#### Impact the world

WPI FPE faculty and graduates are changing the future of fire policy, regulation, and product engineering. They are making the world safer.



“The need for fire protection engineers is growing dramatically—it’s a phenomenon. **The WPI program is top-notch, with an outstanding reputation** for teaching the strongest science and engineering fundamentals. WPI grads are ready to start working as engineers immediately.”

GEORGE TOTH, COO, ROLF JENSEN & ASSOCIATES INC.

# TOUCH LIVES EVERYWHERE WITH A CAREER YOU CAN TAKE ANYWHERE



"The BS/MS program allowed me to incorporate my undergraduate knowledge immediately into my master's. **I learned just how well**

**respected the university is** with my internship at the National Fire Protection Association right here in Massachusetts. It was great to work with experienced engineers developing new codes and standards."

—TRACY GOLINVEAUX, BS/MS '09/'10



"The master's at WPI was the perfect choice for me. Starting full-time on campus, **I landed an internship that allowed me to work in Dubai.**

While working directly with the top executives on my assigned project, I finished the program online. Best of all, the company hired me."

—BASSEL MEHIO, MS '09

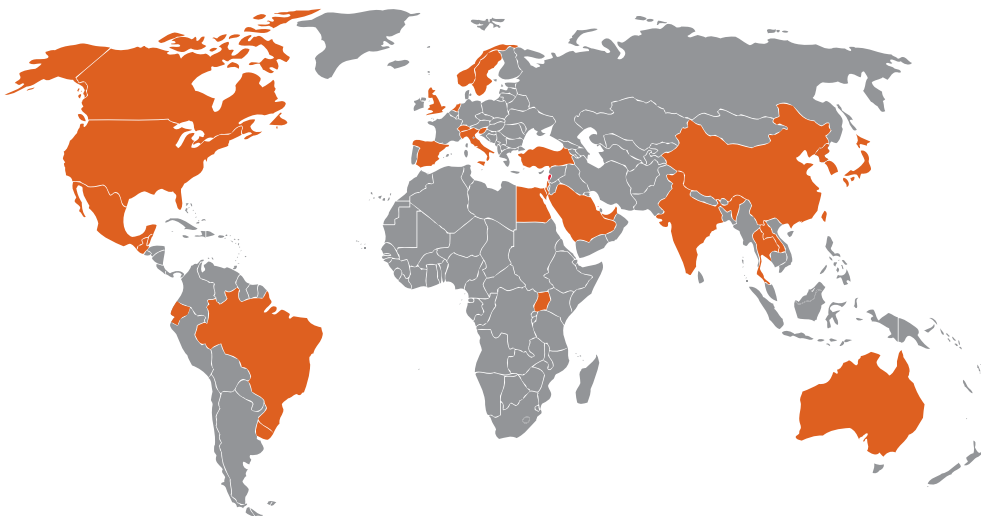
ROLF JENSEN & ASSOCIATES INC., CHICAGO

Fire protection engineering job opportunities put WPI graduates at the cutting edge of new building and product designs worldwide, and at the forefront of new policy.

Our graduates launch careers of their choosing right here in New England, across the United States, and around the world. Secure, high-profile positions empower them to make critical contributions to landmark projects in building and construction, public safety, and product manufacturing.

## WPI FIRE PROTECTION ENGINEERING GRADUATES WORK AROUND THE WORLD

Graduates are employed in interesting and diverse industries including government agencies, military, testing and research laboratories, insurance, manufacturing, architecture, and entertainment.



## A Sample of Employers

3M  
ARUP  
BECHTEL CORPORATION  
BUREAU OF ALCOHOL, TOBACCO & FIREARMS  
CODE CONSULTANTS INC.  
COMBUSTION SCIENCE AND ENGINEERING INC.  
THE WALT DISNEY COMPANY  
ELECTRIC POWER RESEARCH INSTITUTE

ENGINEERING PLANNING & MANAGEMENT INC.  
EXPONENT INC.  
EXXONMOBIL  
FEDERAL AVIATION ADMINISTRATION  
FM GLOBAL  
GE GAP  
U.S. GENERAL SERVICES ADMINISTRATION  
THE HARRINGTON GROUP INC.





APRIL HAMMOND BERKOL, BS/MS '85/'88  
CONSULTANT, ENVIRONMENTAL HEALTH & FIRE SAFETY  
NEW YORK, NY



DAVID SHEPPARD, MS '93  
SENIOR FIRE RESEARCH ENGINEER  
BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES  
AMMENDALE, MD



PETER BELLINO, MS '10  
FIRE SYSTEMS ENGINEER  
TRANS ALASKA PIPELINE SYSTEM  
ANCHORAGE, AK

HUGHES ASSOCIATES INC.  
INTERNATIONAL CODE COUNCIL (ICC)  
LOS ALAMOS NATIONAL LABORATORIES  
NATIONAL FIRE PROTECTION ASSOCIATION  
NATIONAL FIRE SPRINKLER ASSOCIATION  
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY  
PRATT & WHITNEY

RAYTHEON CO.  
ROLF JENSEN & ASSOCIATES INC.  
SANDIA NATIONAL LABORATORIES  
SCHIRMER ENGINEERING CORP.  
SMITHSONIAN INSTITUTION  
SOUTHWEST RESEARCH INSTITUTE  
THE TRAVELERS COMPANIES INC.  
TYCO FIRE SUPPRESSION & BUILDING PRODUCTS

U.S. AIR FORCE  
U.S. COAST GUARD  
U.S. DEPARTMENT OF ENERGY  
U.S. NAVY  
U.S. NUCLEAR REGULATORY COMMISSION  
UNDERWRITERS LABORATORIES INC.  
UNITED TECHNOLOGIES CORPORATION  
UNIVERSAL STUDIOS  
**AND MANY MORE**

# DEVELOPING THE FIRE SCIENCE AND ENGINEERING TECHNOLOGY THAT IMPACTS OUR WORLD



FIRE  
WPI  
SAFETY



## FIRE AND MATERIALS

Nicholas Dembsey, PhD, PE, Associate Professor



A world leader in the study of fire dynamics and the application of fire models, Professor Dembsey, with doctoral candidate Esther Kim, is developing new techniques and a guidance document for practicing engineers to measure fire properties of materials. Their work will allow practicing

engineers to more accurately predict fire behavior. Two of his other graduate students, Joel Sipe and William Wong, are working on materials issues that will allow practicing engineers to more accurately predict how water and materials interact in fire suppression, and how flames spread across materials.

*“My materials work will allow fire protection engineers to develop more effective and efficient designs in the built environment and serve as a basis for improvement of regulatory policy. The result will be greater life safety and property protection in today’s cost-conscious world.”*



FROM TOP: MS student William Wong and Professor Dembsey conduct flame spread research. PhD candidate Esther Kim performing material pyrolysis research.



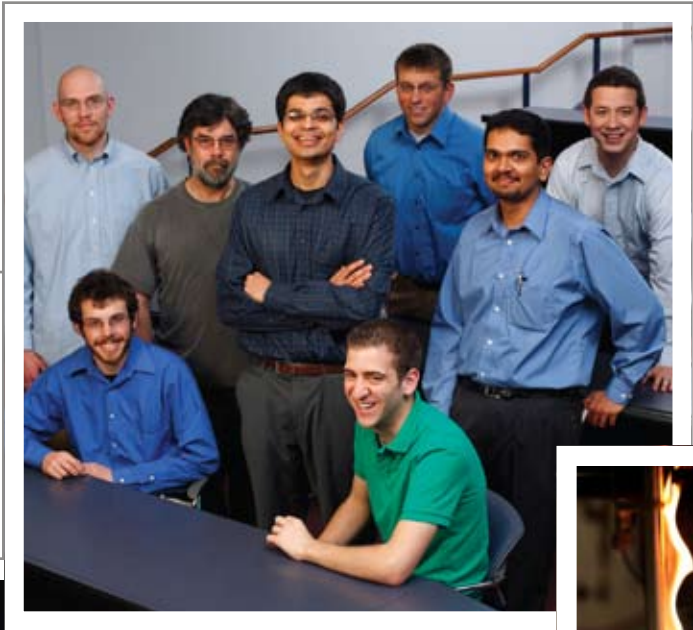
WPI IS A RECOGNIZED WORLD LEADER IN FIRE DYNAMICS AND COMPUTATIONAL MODELING RESEARCH. WPI FACULTY AND THEIR STUDENTS CREATE NEW KNOWLEDGE THAT INFORMS AND SHAPES REGULATORY POLICY, BUILDING DESIGN, PRODUCT MANUFACTURING, AND PRODUCT PERFORMANCE STANDARDS.

### COMBUSTION AND EXPLOSION PROTECTION Ali Rangwala, PhD, Assistant Professor

Ali Rangwala is an extensively published and frequent speaker on combustion, industrial fire protection, and explosion protection. His PhD thesis on flame spread received the IAFSS (International Association of Fire Safety Science) in 2008. Among his potentially life-saving projects is the development of measurement and sensing devices designed to identify the presence, velocity, and flow direction of smoke. Tunnels, tall buildings, and underground transit systems will be safer once this new technology is deployed. Professor Rangwala is also developing benchmark tests to better understand the physics of ignition and deflagration in dust-air premixed combustion.



“Current safety standards do not account for the full range of combustibility of materials found in industrial settings, nor do they provide for accurate measurement of hazardous dust accumulation within the environment. Our research allows scientists to study combustibility in ways that will enable fire safety professionals to predict fire and explosion hazards. Our work on developing novel methods and techniques for measurement of fire-induced flows will aid in better understanding of the complex fire problem.”

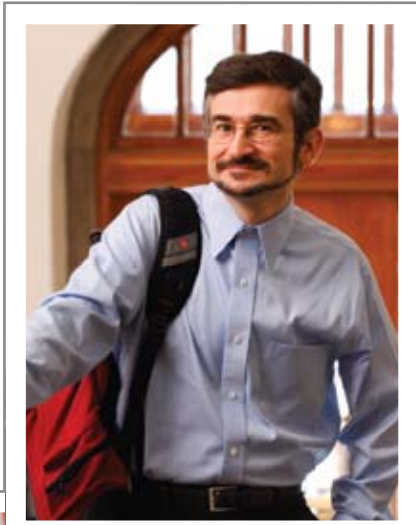


FROM LEFT: PhD candidate Kulbhushan Joshi studies spontaneous ignition of dust layers. PhD candidate Scott Rockwell and Professor Rangwala analyze flow turbulence in heated flows for improved fire instrumentation. Professor Rangwala and his team of laboratory assistants, MS students, and PhD candidates. Laminar upward flame propagation.



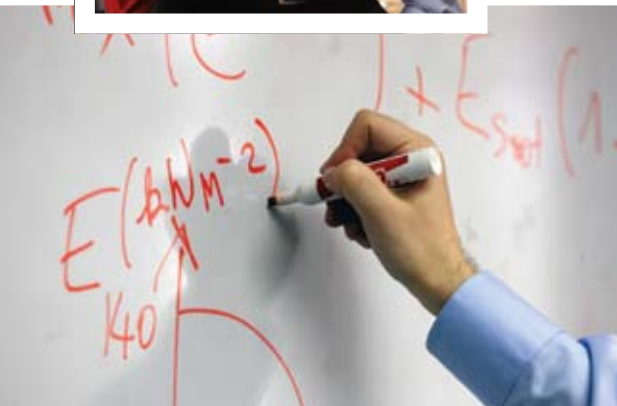
## REGULATORY POLICY, RISK, AND ENGINEERING FRAMEWORK

Brian J. Meacham, PhD, PE, Associate Professor



The author of numerous texts and an internationally recognized expert on risk-informed, performance-based design and regulation, Brian Meacham focuses on the development of new approaches for enhancing public safety. His work has impacted the profession of fire protection

engineering by influencing building regulatory decision makers in the United States and abroad.



“My work requires close collaboration with government agencies responsible for developing regulatory policy, particularly for performance-based building regulations. Historically, building regulations have been developed in response to catastrophic events. Today, there is more focus on gaining fundamental knowledge about the performance of buildings and occupants under a wide range of events, and developing regulations that meet societal expectations for building safety and performance, resulting in a better allocation of resources focused on critical needs.”



FROM TOP: PhD candidate Alberto Alvarez. Computational modeling of fire growth and spread, and evacuation.





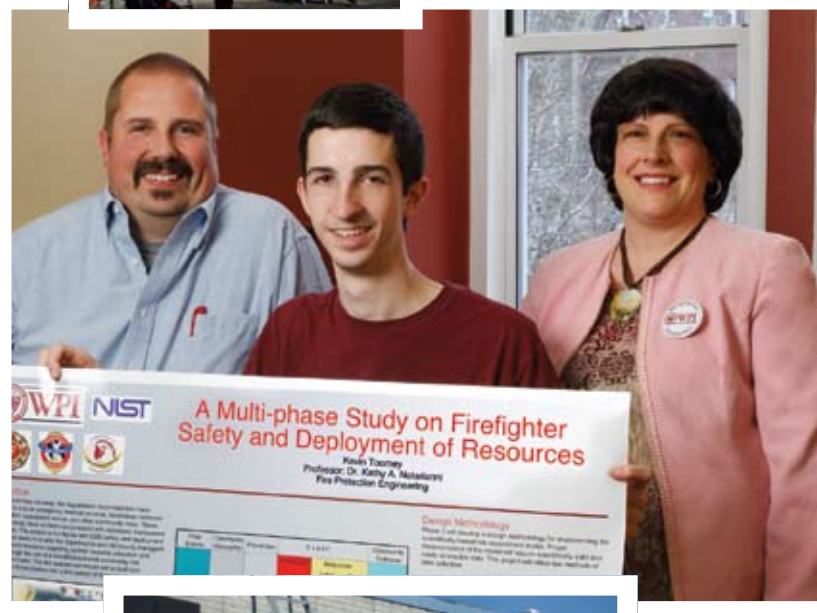
## FIREFIGHTER SAFETY AND POLICY

Kathy Notarianni, PhD, PE, Associate Professor and Department Head

Today, firefighters increasingly serve as first responders for emergency medical calls, civil emergencies, terrorist threats, and hazardous materials incidents, in addition to fire emergencies. Kathy Notarianni is directing a multi-year study to determine the best procedural standards and resource allocation to significantly reduce loss of life and property for both firefighters and civilians. The study is being conducted in concert with the International Association of Fire Fighters and the National Institute of Standards and Technology. It is funded by the Department of Homeland Security.



“Our research will enable government agencies and local jurisdictions to establish optimal resource allocation to improve economics, responses, and outcomes. It will save countless firefighter and civilian lives. We are working with more than 400 fire departments, compiling detailed demographics of each, along with a database of hundreds of thousands of fire department deployments and outcomes that will be analyzed statistically.”



FROM TOP: Experiments conducted as part of Department of Homeland Security research grant. MS students Robert Upson and Gerard Libby with Professor and Department Head Kathy Notarianni.

## BUILDING FIRE SAFETY SYSTEMS

Milosh Puchovsky, MS, PE, Professor of Practice



Adding a professor of practice to WPI's FPE faculty reinforces WPI's commitment to complementing its long-standing efforts in research and engineering theory with a broader, practice-oriented curriculum that also includes the impact of regulatory policies. Having worked in the FPE industry for over 20 years, Professor Puchovsky brings a real-world perspective that allows him to incorporate assignments similar to those a practicing fire protection engineer would take on.

"As a professor of practice I make a concerted effort to identify the limits of our current understanding of fire behavior and its effects, which points to areas that would benefit from further study and research. I focus on making sure the students recognize what value they can bring to their current and future employers, customers, and clients—providing solutions to fire and life safety problems; developing new products, services, or design approaches; or influencing regulatory policy.

AT LEFT: Professor Puchovsky and MS student Megan Woods design fire safety systems.



# GET PAID TO STUDY AS A GRADUATE INTERN

WPI’s expansive network of professional and government relationships is the basis of a unique graduate internship program. Graduate interns are employed full time while maintaining full-time student status. Internships help underwrite the cost of tuition and give students exposure to a variety of business opportunities.

Internships are one year in length and have no geographical restrictions.

### Graduate internships at WPI ensure that students

- + strengthen their knowledge in the laboratory of the real world
- + have access to specialized resources not available on campus
- + can potentially provide data for their thesis or graduate project
- + can apply internship time toward professional engineer registration

Our Graduate Internship Program truly sets WPI apart from other FPE programs. To learn more, including requirements and program availability, visit [wpi.edu/+FPE](http://wpi.edu/+FPE).



**“My first industry experience was a one-year internship resulting in a fully funded master’s thesis—and a great job.** WPI graduates have an accentuated confidence and pride in

professional excellence because of their training. When the result of your professional judgments could result in unnecessary loss of life or property, that confidence makes a difference.”

–TODD HETRICK, MS '09  
EXPONENT INC.



“WPI placed me in an internship program that was indispensable in advancing my career in forensic engineering. The experience enhanced my own career path and put me in direct contact with leading FPE professionals and companies. **WPI has an incredibly impressive list of contacts and business relationships with FPE firms, and the internships are invaluable.**”

IAN GRIERSON, MS '08, THE TRAVELERS COMPANIES INC.



# ADVANCE YOUR CAREER FULL TIME, PART TIME, ON-CAMPUS, OR ONLINE

The WPI Master of Science graduate degree program for FPE is structured to be equally effective for full-time or part-time study, either at our Worcester campus or online.

The online MS program has exactly the same curriculum and requirements as the on-campus program. On-campus and online students study collaboratively through a shared course website. As a result, students can easily “float” between on-campus and online classes, making this the most flexible graduate program in the field.

- + **5-Year BS/MS:** Save time and money by enrolling in a special 5-year program that allows students to enter the job market with two degrees, a BS in one of the traditional engineering disciplines and an MS in fire protection engineering.  
[wpi.edu/+FPE](http://wpi.edu/+FPE)
- + **Master of Science:** For career-oriented students interested in seeking any combination of full-time, part-time, on-campus, or online learning opportunities.  
[wpi.edu/+FPE](http://wpi.edu/+FPE)
- + **PhD:** The doctoral degree offers the most advanced learning and practice available anywhere in the world, producing scholars who contribute new knowledge to the field. It includes a one-year residency requirement.  
[wpi.edu/+FPE](http://wpi.edu/+FPE)
- + **Certificate Program:** Understand the basic concepts of fire protection engineering through a four- or five-course program. Corporate clients can construct a personalized certificate at their location or online. Credits may be applied toward a subsequent MS or PhD.  
[cpe.wpi.edu](http://cpe.wpi.edu)



“The Corporate Certificate program is the first step in obtaining my master’s in FPE. **WPI has made it easy to apply, register, and even pay for classes.** They are supportive and really want me to succeed.”

MICHAEL KNORAS JR., CERTIFICATE '09, SENIOR CONSULTANT, SCHIRMER ENGINEERING CORP.



## WPI ONLINE: NETWORKING THE WORLD'S FIRE PROTECTION ENGINEERS

Since 1993, students from across the United States and more than 35 countries have earned FPE degrees without ever coming to Worcester.

- + WPI stands alone in offering one graduate program to both on-campus and online students.
- + Online and on-campus students share the same classes at the same time, collaborating virtually on study projects.
- + Lectures can be viewed online via video stream or on campus in the classroom—all students get the same lecture.
- + Only WPI gives all students access to the same lecture videos, printed materials, and professional notes.

WPI's unique program offers online students dynamic, real-time relationships with faculty. Small groups of students and faculty coalesce around common professional or research interests. It is a deeply committed online community that spans the globe.

**"Distance learning allows me the luxury of getting my graduate degree while working full time.** The curriculum and interactive, virtual classroom provide the flexibility I need while maintaining the same high standards as a classroom program."

—ASHLEY POULIN, MS '09  
ENGINEERING PLANNING & MANAGEMENT INC., U.S.

**"I live and work in Europe but study at WPI** with no problem. The online courses are diverse, and apply directly to my work as a fire protection engineer. A bonus for me is the WPI program offers a different perspective than what I might find locally, thus increasing my value as an engineer."

—RICKARD HANSON, MS '08  
KALMAR BRAND KAR, SWEDEN

[ [online.wpi.edu](http://online.wpi.edu) ]



# EXPAND YOUR KNOWLEDGE, CRITICAL THINKING, AND CAREER OPPORTUNITIES



## Topics of study and research

- + Compartment fire dynamics and fire modeling
- + Fire properties of materials
- + Fire investigation and fire reconstruction
- + Firefighter safety
- + Fire policy, risk, and uncertainty
- + Fire protection systems
- + Combustion and explosion protection



Experts from a broad array of backgrounds come together to solve fire protection engineering challenges. WPI's students come from such diverse disciplines as chemical, mechanical, electrical, or civil engineering, architecture, and more. Our courses lay the groundwork to a firm understanding of the dynamics of fire: causes, prevention, and how to protect from fire's devastating effects.

## MS PROGRAM REQUIREMENTS—30 Credits

### Core Courses *(all courses required)*

- FPE 521** Fire Dynamics
- FPE 553** Fire Protection Systems
- FPE 570** Building Fire Safety

### Integration Courses *(one course required)*

- FPE 571** Performance-based Design
- FPE 573** Industrial Fire Protection

### Elective Courses

- FPE 520** Fire Modeling
- FPE 554** Advanced Fire Suppression
- FPE 555** Detection, Alarm, and Smoke Control
- FPE 571** Performance-based Design
- FPE 572** Failure Analysis
- FPE 573** Industrial Fire Protection
- FPE 575** Explosion Protection
- FPE 580** Special Topics
- FPE 580 M** Fire, Risk, and Regulatory Policy
- FPE 580 N** People in Fire
- FPE 580 Q** Combustion
- FPE 590** Thesis (full-time students)

The MS degree can be completed in 1 year full time, or 2 to 3 years part time.

Course descriptions and details about the WPI curriculum can be viewed at both the Fire Protection and Distance Learning websites.

[wpi.edu/+FPE](http://wpi.edu/+FPE)  
[online.wpi.edu](http://online.wpi.edu)

**NOTE:** Up to 9 graduate credits can be taken in other WPI programs or transferred in.





## ADMISSIONS CRITERIA

Fire protection engineering degree candidates typically have a BS in engineering. Applicants with a BS degree in other scientific or technology-oriented disciplines work closely with an advisor to develop a customized set of background courses in calculus and engineering science to ensure their success.

This personalized approach is a signature strength of WPI's program and is provided to all applicants and students.

For further assistance contact:  
 Department of Fire Protection Engineering  
 508-831-5593  
 email: [fpe@wpi.edu](mailto:fpe@wpi.edu)

### Application requirements

- + Online application
- + Statement of purpose
- + Official transcripts
- + 3 letters of recommendation
- + Application fee

### Additional requirements for foreign students

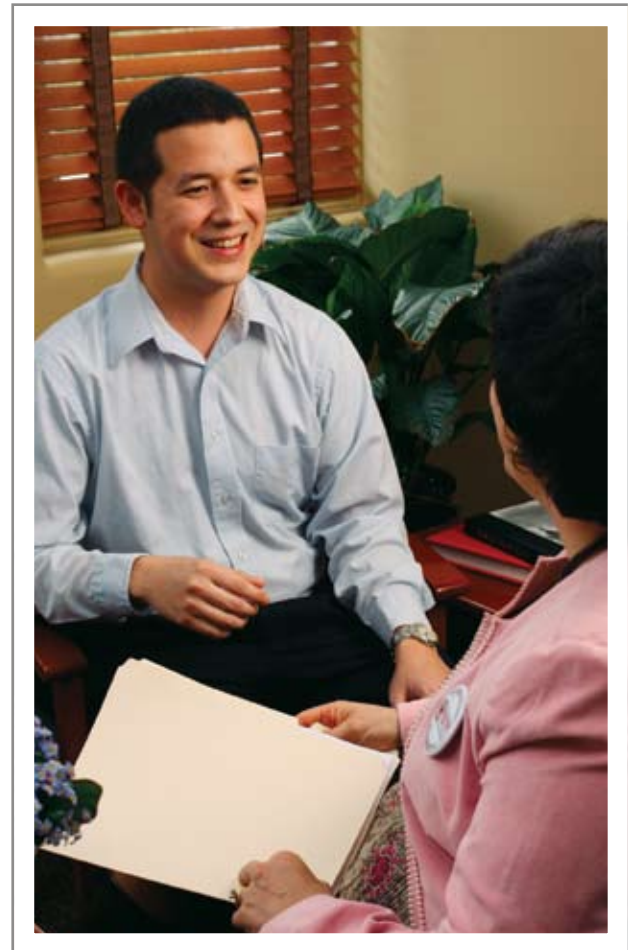
- + GRE
- + TOEFL or IELTS for students whose first language is not English

### Additional requirements for PhD students

- + Samples of scholarly writing  
[grad.wpi.edu/Prospective/admissions.html](http://grad.wpi.edu/Prospective/admissions.html)

### Application deadlines, financial aid, and scholarships

Admissions applications are reviewed on a rolling basis. Financial Aid deadlines are available at [wpi.edu/Admin/FA](http://wpi.edu/Admin/FA)



"The application process at **WPI offers personalized assistance with admission tailored around my previous research and coursework.** Dr. Notarianni continues to guide me in choosing the most advantageous courses, challenging research, and even contacts employers about potential internship opportunities for me."

—KRISTOPHER OVERHOLT, MS '09



FIRE PROTECTION ENGINEERING

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100 Institute Road | Worcester, MA 01609-2280

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Office of Distance Learning  
Phone 508-831-6789 | [online@wpi.edu](mailto:online@wpi.edu) | [online.wpi.edu](http://online.wpi.edu)



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less VOCs than  
conventional inks.