

**Purdue University
College of Engineering
Online Graduate Degrees
2023 Annual Report**

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**INTERIM DEAN
OF PURDUE UNIVERSITY'S
COLLEGE OF ENGINEERING**
Mark Lundstrom

The Don and Carol Scifres Distinguished Professor of Electrical and Computer Engineering

Purdue University is proud of the growing community of online learners within our top-ranked engineering programs. We're likewise proud of the value our growing battery of online degrees and certificates provide to working professionals and international students who can't come to campus. Our online students now represent all 50 states and over 30 countries. Enrollment grew 50 percent from 2021 to 2022 and we more than doubled the number of unique online graduate courses we offer. Purdue engineering will continue to advance online learning with excellence and scale, from affordable master's degrees to industry co-hosted badges, and from global university partnerships to virtual lab pedagogy.

The most recent U.S. News & World Report rankings place Purdue number two in best online graduate programs in engineering, Purdue has consistently ranked among the top five in best online master's in engineering programs for the past eight years. Purdue ranked first this year for its online graduate programs in Electrical Engineering, Industrial Engineering, Mechanical Engineering, and Engineering Management; second in Civil Engineering; and fourth in online engineering programs for veterans. This report covers the past year's highlights for Purdue's online engineering programs.

Purdue University online engineering continues to gain momentum and demonstrate leadership, variety, integrity and innovation.

In the 2023 U.S. News & World Report rankings, the program as a whole moved to the No. 2 spot, up from No. 3 in 2022. Remaining at No. 1 are online master's degrees in electrical engineering, industrial engineering, mechanical engineering, and engineering management. The civil engineering master's program retained its No. 2 position, while online engineering master's programs for veterans rose to No. 4 from No. 5 in 2022.

Our program's breadth is evidenced by a 50 percent increase in enrollment from 2021 to 2022, as well as students who hail from all 50 states and 31 countries. With the popularity of online professional development programs growing, the College of Engineering remains steadfast in meeting this need.

As a faculty member devoted to microelectronics research and education, I was honored to be part of the team who, in May 2022, introduced Purdue's Semiconductor Degrees Program (SDP) to address the urgent demand for semiconductor engineers. The curriculum's first new degree is an online master of science in microelectronics and

semiconductors. The program allows students to customize their courses in the areas most relevant to their jobs and career goals with training and skills that can be applied in the workforce immediately.

Also in 2022, the Weldon School of Biomedical Engineering announced a new online master of science degree, answering a call for engineers in healthcare fields. The online courses are identical to their on-campus counterparts, and they cover such topics as biostatistics, signal processing, engineering ethics, and medical device regulation.

In addition, we continue to enhance our industry partnerships, resulting in hundreds of employees earning professional certifications in rapidly emerging areas, including hypersonics, Agile and Lean Six Sigma, systems engineering, cybersecurity, and data analytics.

As is the norm in our college, we always will strive to enrich and expand our online offerings by identifying areas for advancement, as well as courses of study, tailored to the workforce demands of the future.

A handwritten signature in black ink that reads "Mark Lundstrom". The signature is fluid and cursive, with a large, stylized "M" and "L".

Mark Lundstrom



SENIOR VICE PRESIDENT,
PURDUE UNIVERSITY ONLINE AND LEARNING INNOVATION

Gary Bertoline

Distinguished Professor of Computer Graphics and Computer and Information Technology

Purdue Online officially became Purdue University Online near the end of 2022, a name change designed to better reflect the organization's primary role - facilitating online courses and programming in partnership with the colleges, schools, departments and faculty of Purdue's flagship West Lafayette and regional campuses.

The new name emphasizes Purdue University Online's mission as an extension of Purdue's residential campuses offering online courses and programs, and it distinguishes Purdue University Online from Purdue Global, Purdue's online university for working adults.

We're especially focused on serving professionals with established careers looking to enhance their knowledge and skills to meet changes in and stay at the top of their business.

Purdue University Online operates a detailed launch process for adding new high-quality, high-value online offerings, including graduate degrees, certificates and noncredit professional development courses and programs. The process includes a market analysis and lays out how the curriculum will be developed, approved, launched, supported, and assessed. Expert Purdue University Online staff supports faculty and campus units in developing and deploying courses and programs with the right pedagogy and technology. Staff also assists with marketing, recruiting, enrolling new students, and supporting and advising enrolled students.

The College of Engineering has been a top partner in working with Purdue University Online. Engineering's online graduate degree and certification programs consistently rank among the country's best, addressing national needs in key areas such as semiconductors and microelectronics, hypersonics, and more. Purdue's online enrollment in engineering programs has nearly tripled in the past five years.

The College of Engineering's online efforts have been supported by Dean Mung Chiang, now Purdue's president, and overseen by Dimitrios Peroulis, currently head of Elmore Family School of Electrical and Computer Engineering, and the College of Engineering's academic lead for online learning since January 2018. On July 1, Professor Peroulis will succeed me as senior vice president for Purdue University Online reporting directly to President Chiang.

I have no doubt that the growth of online offerings not only from the College of Engineering but from academic units and faculty across Purdue's three residential campuses will continue. At a time when education throughout our lives is more important than ever, Purdue's leaders recognize that online learning needs to have an integral place in the university's future and that it is, indeed, central to Purdue's role as a model - perhaps the model - 21st Century Land Grant institution.

Purdue University Online is committed to facilitating this by providing an online student experience that is best in class. We will continue to refine and expand our services and will use industry-leading practices to capture and retain as much enrollment as possible now, while pursuing new opportunities, especially in high-need, high-demand areas. Purdue is not alone in this endeavor and there will be challenges ahead, but there are ample opportunities in the online space as well. We plan to take advantage of them and to continue our strong support for and collaborations with the College of Engineering.

Gary Bertoline

ENROLLMENT IN ENGINEERING ONLINE AND HYBRID
DEGREE PROGRAMS NEARLY

TRIPLED IN 5 YEARS

ONLINE PROGRAMS

MASTER'S DEGREES

- Aeronautics & Astronautics (MSAA)
- Biomedical Engineering (MSBME)
- Civil Engineering (MSCE)
- Dual Degree MSE+MBA
- Electrical & Computer Engineering (MSECE)
- Engineering Education (MSENE)
- Industrial Engineering (MSIE)
- Interdisciplinary Engineering (MS/MSE)
- Mechanical Engineering (MSME)
- Nuclear Engineering (MNE)
- Microelectronics and Semiconductors (MS/MSE)

INTERDISCIPLINARY ENGINEERING CONCENTRATIONS

- Aeronautics and Astronautics
- Biomedical Engineering
- Computational Engineering
- Electrical and Computer Engineering
- Engineering Management and Leadership
- Integrated Vehicle Systems Engineering
- Industrial Engineering
- Mechanical Engineering
- Materials Engineering
- Nuclear Engineering
- Quality Engineering
- Systems Engineering

GRADUATE CERTIFICATES

- Applied Heat Transfer
- Digital Signal Processing
- Hypersonics
- Noise Control
- Teaching and Learning in Engineering
- Regulatory Affairs and Regulatory Science for Medical Devices
- Systems

ONLINE COURSES

- Aeronautics & Astronautics
- Agricultural and Biological Engineering
- Biological Sciences
- Biomedical Engineering
- Civil Engineering
- Computer Science
- Construction Engineering and Management
- Data Science
- Electrical & Computer Engineering
- Engineering Education
- Industrial Engineering
- Mathematics
- Mechanical Engineering
- Materials Engineering
- Nuclear Engineering
- Statistics
- Systems

PROFESSIONAL CERTIFICATIONS

Lean Six Sigma

- Lean Six Sigma Green Belt
- Lean Six Sigma Green Belt Refresher
- Lean Principles
- Lean Six Sigma Black Belt

Project Management

- Project Management Essentials
- PMP® Exam Preparation
- Agile Project Management

Model-Based Systems Engineering

Systems Engineering Processes and Professional Competencies*

Building Water Essentials

Cyber Security Design for Security

For the most up to date list, see us at engineering.purdue.edu/online

*Accepted by the International Council on Systems Engineering (INCOSE) for academic equivalency to meet INCOSE requirements.

145

CURRENT FACULTY

200+

UNIQUE GRADUATE ENGINEERING COURSES

15

ENGINEERING DISCIPLINES

2023 GRADUATE PROGRAM RANKINGS

Consistently near the top of the U.S. News and World Report Best Online Programs rankings, Purdue University ranks No. 2 in the 2023 rankings for online graduate engineering programs, tops in the Big Ten, and is No. 1 in four categories, placing it among the nation's elite.

"Purdue engineering will remain committed to offering quality programs through innovative educational vehicles for our growing online community," said Dimitrios Peroulis, Purdue's Michael and Katherine Birck Head and Reilly Professor in the Elmore Family School of Electrical and Computer Engineering. "We are grateful to our online students, dedicated faculty, academic advisors, success coaches, alumni and Purdue engineering online staff for their critical contributions to this effort."

Professor Peroulis has served as engineering's academic lead for online learning since January 2018 and has been appointed senior vice president of Purdue University Online, effective July 1, 2023.

The organizers of the annual U.S. News rankings analyze such factors as the quality of students entering a program; online teaching practices so students stay enrolled and graduate on time; how the programs employ technologies to allow students flexibility; and the quality of student support services, career guidance and financial aid resources. Also weighed are faculty credentials and training, including the degree to which online instructors' credentials mirror those of on-campus faculty and the training instructors receive to teach distance learners. In addition, U.S. News conducts a peer assessment survey of high-ranking academic officials - in the case of the engineering rankings, deans of engineering schools and top online learning leaders - as an important element of reviewing Purdue and other institutions for ranking.



#1 BEST ONLINE MASTERS
IN ELECTRICAL ENGINEERING PROGRAMS

#1 BEST ONLINE MASTERS
IN INDUSTRIAL ENGINEERING PROGRAMS

#1 BEST ONLINE MASTERS
IN MECHANICAL ENGINEERING PROGRAMS

#1 BEST ONLINE MASTERS
IN ENGINEERING MANAGEMENT PROGRAMS

#2 BEST ONLINE MASTERS
IN CIVIL ENGINEERING PROGRAMS

#4 BEST ONLINE MASTERS
IN ENGINEERING PROGRAMS FOR VETERANS

“We are grateful to our online students, dedicated faculty, academic advisors, success coaches, alumni and Purdue engineering online staff for their critical contributions to this effort.”

DIMITRIOS PEROULIS

Purdue's Michael and Katherine Birck Head and Reilly Professor in the Elmore Family School of Electrical and Computer Engineering

COLLEGE OF ENGINEERING ONLINE GRADUATE PROGRAMS

MASTER'S IN AERONAUTICS AND ASTRONAUTICS

The online Master's in Aeronautics and Astronautics brings Purdue's legacy of excellence in aerospace to students from all over the globe. Students work on a flexible schedule and can customize their degrees by specializing in high-demand areas such as aerodynamics, aerospace systems, astrodynamics and space applications, dynamics and control, structures and materials and computational engineering.

MASTER'S IN BIOMEDICAL ENGINEERING

Purdue's online Master's in Biomedical Engineering provides students with a comprehensive engineering education relevant to the fast-growing biomedical and healthcare industries. Students can choose from a large course menu including classes in biomedical engineering, regulatory engineering, life sciences and quantitative analysis. Graduates are prepared for lucrative careers in biomed and related fields.

MASTER'S IN CIVIL ENGINEERING

Ranked in the top two online civil engineering graduate programs by U.S. News and World Report - 3 years running, Purdue's Master's in Civil Engineering prepares students for dynamic careers in civil engineering. Boilermaker civil engineers are pioneers whose skills span the entire spectrum of civil engineering applications. Graduates of the program have a sound understanding of engineering fundamentals and are well-versed with state-of-the-art tools and methods for creating innovative solutions to real-world civil engineering problems.

MASTER'S IN ELECTRICAL AND COMPUTER ENGINEERING

Ranked the number one online electrical engineering graduate program by U.S. News & World Report - 3 years running, Purdue's Master's in Electrical and Computer Engineering poises students for career advancement. Students can specialize their graduate studies with courses in automatic controls; communications, networking, signal, and image processing; energy sources and systems; fields and optics; microelectronics and nanotechnology; and VLSI and circuit design. Designed for professional engineers, this fully online degree also affords students more flexibility than an in-person master's.

MASTER'S IN ENGINEERING EDUCATION

The online Master of Science in Engineering Education (MSENE) program is conveniently designed for professional engineers, industry training professionals, university faculty members, and graduate-level STEM students who want to advance their skills without disrupting their careers or current studies. The program covers the theory and practice of engineering education in a flexible online format. All courses are taught by the same expert faculty who teach on campus at Purdue.

MASTER'S IN INDUSTRIAL ENGINEERING

Ranked the number one online industrial engineering graduate programs by U.S. News & World Report - 3 years running, Purdue's online Master's in Industrial Engineering makes a world-class engineering education accessible to students everywhere. Courses offered in this program include Computational Engineering, Human Factors Engineering and Human-Computer Systems, Manufacturing Processes and Precision Engineering, Production Systems Design, Automation and Control, Mathematical Programming and Combinatorial Optimization, Engineering Statistics, Stochastic Processes, and Computer Simulation.

INTERDISCIPLINARY MASTER'S IN ENGINEERING

Ranked in the top two best online engineering graduate programs by U.S. News and World Report (2023), Purdue's online Interdisciplinary Master's in Engineering is our most popular online engineering program. This degree is highly customizable and can be customized to fit a student's unique goals. Students choose from over 12 concentration areas, including aeronautics and astronautics, biomedical, computational, engineering management and leadership, electrical and computer, industrial, integrated vehicle systems, quality, nuclear, mechanical, and systems engineering.

PURDUE UNIVERSITY LEADS THE WAY IN SEMICONDUCTOR ONLINE EDUCATION

Virtually anything electronic has at least one semiconductor chip inside it and likely many more. The federal government and major companies in the industry are pushing for a rapid expansion of semiconductor production capacity in the U.S. to increase supply and reduce reliance on overseas sources. But an essential component of the semiconductor industry could well remain in short supply – people.

Purdue and the College of Engineering are addressing the demand for a trained workforce with a Comprehensive Semiconductors and Microelectronics Program, which was announced in May 2022. The nation-leading program spans semiconductor research and development – from materials and devices, to circuits, systems, architecture, advanced packaging integration, and the supply chain.

The program will feature a full suite of degree and credential options for semiconductor training, ranging from traditional on-campus courses, a new set of degrees, competitive internships to innovative “learning while working” programs, flexible online courses, and virtual laboratories. Purdue aims to award 1,000 degrees and certificates annually by 2030, in person and online.

Online learning will play an integral role in the program, whose first new degree is a 100% online Master of Science in microelectronics and semiconductors. The new online master’s is a “6-in-1” interdisciplinary degree focused on all aspects of microelectronics and semiconductors, with Purdue’s top-ranked Elmore Family School of Electrical and Computer Engineering, its Mechanical, Materials, Industrial and Chemical Engineering Schools, and its Environmental and Ecological Engineering Division all deeply involved. The interdisciplinary nature of the new degree allows students, working with expert Purdue faculty, to customize their program and focus on specific areas of microelectronics and semiconductors relevant to their jobs and career goals.

MASTER’S IN MECHANICAL ENGINEERING

Ranked the number one online mechanical engineering graduate program by U.S. News & World Report - 3 years running, Purdue’s Master’s in Mechanical Engineering is designed to meet the needs of professional engineers. Students can customize their degrees through courses in acoustics, noise control, biomechanics, combustion, design, fluid mechanics and propulsion, heat transfer, HVAC, mechanics, vibration, and nanotechnology. All courses are taught by Purdue Engineering faculty.

MASTER IN NUCLEAR ENGINEERING

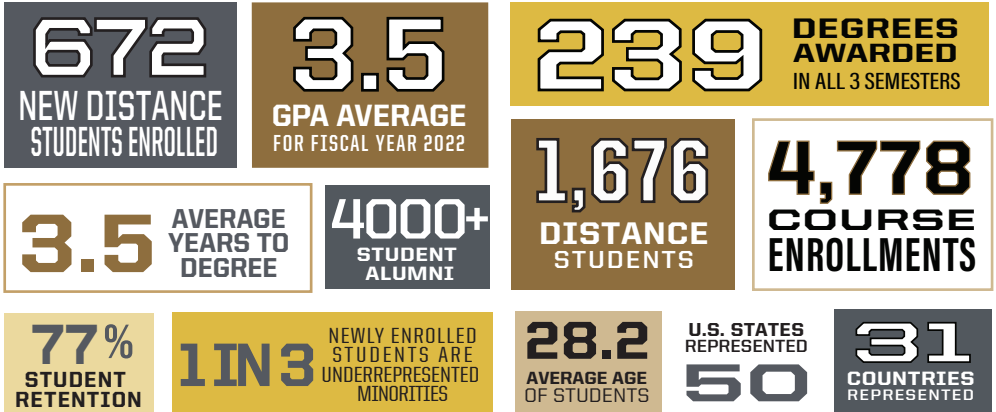
Purdue’s Master in Nuclear Engineering prepares students for dynamic and exciting careers in nuclear energy production and related fields. Students can specialize in areas such as reactor physics, nuclear materials, fusion, thermal hydraulics, safety, and radiation and security. Purdue’s School of Nuclear Engineering emphasizes ethical nuclear engineering standards and encourages students to create innovations in the nuclear engineering field.

DUAL MASTER OF SCIENCE IN ENGINEERING + MASTER OF BUSINESS ADMINISTRATION

Ranked number one in Best Online Master’s in Engineering Management Programs by U.S. News and World Report for the 2nd consecutive year, Purdue’s dual MS and MBA degree program provides students with a high-powered combination degree designed for leaders in the field. Students earn two in-demand degrees in less time and for less money than if both degrees were pursued separately. This unique degree program is offered via a partnership between Purdue’s College of Engineering and Indiana University’s Kelley School of Business.

PURDUE UNIVERSITY ONLINE ENGINEERING GRADUATE STUDENTS

Purdue's online graduate students take giant leaps to earn their masters' degrees and complete the rigorous coursework that Purdue's world-class engineering faculty are famous for. See below for stats on our 2021-2022 students:



STUDENT—INDUSTRY CONNECTIONS

Learners Hail from a remarkably broad range of industries. These companies are among the top represented that employ our academic learners.

| | | |
|---------------------------|----------------------------|---------------------|
| <i>Lockheed Martin</i> | <i>Raytheon</i> | <i>Cummins</i> |
| <i>Northrup Grumman</i> | <i>Qualcomm</i> | <i>NVIVIA</i> |
| <i>General Motors</i> | <i>NAVAIR</i> | <i>Samsung</i> |
| <i>The Boeing Company</i> | <i>General Electric</i> | <i>US Army</i> |
| <i>NASA</i> | <i>Texas Instruments</i> | <i>US Air Force</i> |
| <i>Intel Corp</i> | <i>Pratt & Whitney</i> | <i>US Navy</i> |

**Statistics do not include nearly 2,500 learners in the professional certification program.
See engineering.purdue.edu/online for more information*

ONLINE ENGINEERING PROFESSIONAL DEVELOPMENT

The popularity of online professional development programs offered through the College of Engineering continued in 2022 with enrollment surpassing 2,400 students. Purdue continues to develop new industry partnerships resulting in professional development courses and course series to augment employee skills, along with industry-recognized certificates to support corporate needs. Some examples include:

- Product and process improvement courses: Short courses in areas such as Agile, Lean Six Sigma and Project Management Essentials – all in-demand certifications – continue to be popular. The Lean Six Sigma Green Belt course alone attracted more than 1,000 students in 2022 and nearly 500 students enrolled in the Project Management Essentials course. Corporate partner Elanco is among those who have taken advantage of these offerings.
- A suite of workforce development courses in data analytics: This is a multi-year collaboration with Cummins and Wabash centered on developing a series of online education modules taught by Purdue West Lafayette faculty. The goal is to provide employees with a fundamental knowledge of data science in engineering and applications, including big data analytics and deep learning.
- Cybersecurity courses to fill a corporate need: In this partnership with Cummins, Lilly and Wabash, Purdue University Online leverages existing online courses taught by Purdue West Lafayette faculty to supplement the partners' internal information security training. The goal is for employees to build skills applicable to their job and set them up to engage more effectively in information technology solution delivery. Individuals earn a digital badge and professional development units in the process.
- Courses for training and certifying learners in systems engineering: Defense contractor ManTech is using Purdue's program in Model-Based Systems Engineering Foundations and Applications to the Production Enterprise. This is a series of seven Purdue West Lafayette faculty-developed modules that can be taken as a group or individually. Purdue also offers an online INCOSE certification equivalency course.
- Graduate certificate in hypersonics: ManTech employees also have taken advantage of Purdue's new Hypersonic Graduate Certificate. The fully online four-course, 12-credit program is designed for working professional engineers who want to gain graduate-level knowledge in hypersonics and state-of-the-art methods in aerospace propulsion, compressible flows and fluid dynamics.

COURSE NAME

ENROLLMENTS

JULY 1, 2021-JUNE 3, 2022

| | |
|--|--------------|
| DATA SCIENCE | 80 |
| IOT | 0 |
| DATA SCIENCE 2 | 60 |
| DEEP LEARNING | 20 |
| FOUNDATIONS OF SECURE DESIGN | 32 |
| SECURE DESIGN | 10 |
| SECURE OPERATIONS | 39 |
| SECURE APPLICATIONS | 33 |
| PROJECT MANAGEMENT ESSENTIALS | 494 |
| PMP EXAM PREP | 106 |
| AGILE CERTIFICATE COURSE | 66 |
| LEAN SIX SIGMA GREEN BELT | 1047 |
| LEAN SIX SIGMA GREEN BELT REFRESHER | 13 |
| LEAN SIX SIGMA YELLOW BELT | 2 |
| LEAN PRINCIPLES | 253 |
| LEAN SIX SIGMA BLACK BELT | 111 |
| MODEL-BASED SYSTEMS ENGINEERING | 65 |
| TOTAL | 2,431 |

**NON-CREDIT PROFESSIONAL COURSES ARE OFFERED
1-4X PER YEAR DUE TO SME INSTRUCTOR AVAILABILITY.**

BOILERMAKER STORIES

WHY DID YOU CHOOSE PURDUE?



JUSTIN FIGUEROA

ONLINE MASTER'S OF ELECTRICAL AND COMPUTER ENGINEERING ALUMNUS

I chose Purdue for my Master's in Electrical and Computer Engineering (MSECE), because I know that Purdue's engineering program curriculum is internationally respected. As a practitioner, Purdue's MSECE program was an easy choice because of the flexibility it offers through online learning.

Purdue MSECE's curriculum provided the structure for me to learn concepts that I apply to my job. If, like me, you learn best from completing realistic assignments and working with a mentor, Purdue has you covered!



GANGA JAYARATHNA

ONLINE MASTER'S OF ELECTRICAL AND COMPUTER ENGINEERING STUDENT

Purdue had developed a reputation as one of the country's greatest universities with outstanding academics and innovative courses in the microelectronics and nanotechnology fields. I strongly believe this MS program will help me clarify and deepen my research interests and make important strides in my career.

Purdue Masters's in Electrical and Computer Engineering offers several courses (1-3 credits) which include emerging fields such as quantum computing and quantum technology. Also, most of the faculty are easily accessible and engage with us very well.



AERIELLE KARR

ONLINE MASTER'S OF CIVIL ENGINEERING STUDENT

Purdue has one of the most respected civil engineering programs in the country. The diversity of Purdue's online masters's in civil engineering course offerings makes this degree a great steppingstone for my career. The civil engineering industry requires its leaders to have a broad skillset for solving complex problems, and this degree is empowering me to become a problem-solver.

The flexibility of the online degree allows great work-life balance given my demanding and challenging career as a civil engineer with the FAA. The program's affordability is another huge benefit.



ANGELA ASHMORE

ONLINE MASTER'S IN MECHANICAL ENGINEERING, ALUMNA
When my employer offered to pay for my master's degree, Purdue was the obvious first choice. I was able to take master's classes in mechanics and dynamics online at Purdue while still moving forward in a career I loved. One of my biggest dreams was to be the first woman IndyCar engineer to win the Indy 500 – and using the skills I learned at Purdue, I was able to do just that.

FIRST WOMAN INDYCAR CREW MEMBER TO WIN INDY 500



ERNIE CARR

INTERDISCIPLINARY ENGINEERING GRADUATE, CONCENTRATION SYSTEMS ENGINEERING

Ernie Carr went back to school for a master's degree in Interdisciplinary engineering to broaden his career opportunities. At Purdue, he found a prestigious program with the flexibility he needed to continue working while completing his studies online. The quality and rigor of Purdue's courses and the extensive support of its engineering faculty gave Carr everything he needed to accomplish his goals. .



ERIC ARAUJO

ONLINE AGILE PROJECT MANAGEMENT ALUMNUS

Eric Araujo completed Purdue's Agile certification to learn more about project management. His instructor was an Agile expert and the curriculum focused on real-world exercises that helped Araujo put his learning into context. The skillsets he learned proved to be highly transferable, increasing Araujo's project management acumen and expanding his career horizons.



PURDUE
UNIVERSITY®

College of Engineering

516 Northwestern Ave.
West Lafayette, IN 47906
Direct: (765) 494-7015

engineering.purdue.edu/online
engronline@purdue.edu

