

Professor helps engineers design better decisions

Doug Montgomery's global online course series puts ASU's industrial engineering expertise on the map

By Kelly deVos, ASU News
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Nothing is left to chance in industry when efficiency, safety and millions of dollars are on the line. Companies run experiments to answer tough questions: Which materials will last longer? What process is most cost effective? How can we reduce defects without sacrificing speed? The answers can't come from hunches. They must be earned through well-designed experiments.

For those in industrial and systems roles, the ability to plan and interpret those experiments is essential. Helping engineers worldwide develop and refine those capabilities is the goal of [Douglas C. Montgomery](#)'s massive open online specialization series on the design of experiments, which now enables thousands to solve complex problems with clarity and confidence.

Montgomery is a Regents Professor in the [School of Computing and Augmented Intelligence](#), part of the [Ira A. Fulton Schools of Engineering](#) at ASU, and a seminal figure in industrial engineering. His impact on how engineers learn to design better experiments has set the global standard. He has parlayed decades of experience, a bestselling textbook and a signature teaching style into one of ASU's most successful online offerings: the hugely popular [Design of Experiments Specialization](#) course series.

(Video: https://youtu.be/yxMXQQ_bwZU?si=i6Ptk3uDpcRDDr3P)

Meet the online engineering course that's making waves worldwide

Montgomery's specialization is hosted on [Coursera](#) and designed for a large global audience. The course is flexible and self-paced, with four modules that take participants from basic to advanced applications of experimental design.

With more than 38,000 enrollments in the course series since its inception, the specialization is part of ASU's vision of learner-centric design, where faculty strive to meet people where they are, whether they're mid-career engineers, recent graduates or professionals seeking a pivot.

According to [Michael Low](#), product manager for Fulton Schools [Global Outreach and Extended Education](#), more than half of participants are looking to upskill for advancement, while over 20% hope to use the course as a stepping stone to new opportunities.

The course series draws a diverse range of learners: 35% hold master's degrees, 29% bachelor's degrees and 36% are non-degreed, highlighting its advanced yet accessible nature.

"It's been a success beyond anything I could have imagined," Montgomery says.

From bored students to bestsellers

Montgomery's passion for experimental design dates to his undergraduate days at Virginia Polytechnic Institute and State University, where a charismatic professor named Ray Myers introduced him to the field.

"Ray was a gifted teacher," Montgomery says. "He emphasized that all engineers and scientists run experiments. But many of them are not well thought out, or as we now say, well designed."

That spark continued through graduate school and eventually led to a faculty role at Georgia Institute of Technology, where he took over the graduate-level experimental design course. He quickly saw a problem: The available textbooks focused on agricultural examples such as crop yields and animal studies, leaving students struggling to connect with the material.

Montgomery set out to change that. He connected with faculty members across disciplines, volunteered on research projects and collected relevant industrial examples. The result was "Design and Analysis of Experiments," first published in 1976 and now in its 10th edition. The book is a global bestseller and holds more than 65% of the market share for its subject.

G. Don Taylor, executive vice provost and the Charles O. Gordon professor of industrial and systems engineering at Virginia Tech, used the book early in his career.

"When I taught 'Design and Analysis of Experiments' as a young professor, Doug's book was incredibly helpful," he says. "I don't know what I would have done without such great study material."

Hot topics, cool guests

For professionals in the workforce, Montgomery's specialization offers more than academic theory. It provides access to a global network through his monthly [fireside chats](#).

"Doug's been around for a long time, and his professional network is incredible," Low says.

"The fireside chats pull together a ton of resources for working professionals. The value can be very high for being able to participate in that network."

Join the next fireside chat

Join Doug Montgomery for [the next fireside chat](#) on Sept. 3 from 9:30–10:30 a.m. MST. Doug's guest speaker will be JMP's Distinguished Research Fellow Bradley Jones, who will discuss UBridge designs for space filling while considering noise.

Once a month, Montgomery invites a guest speaker from either academia or industry to present on a key topic in experimental design. Sessions include a live Q&A and are recorded and shared on YouTube. More than 40 are now available.

A gateway to a future in industrial engineering

For those considering a master's degree in industrial engineering or engineering management, the online specialization offers more than a preview — it's a trial run.

The course is based on IEE 572: Design Engineering Experiments, a foundational graduate-level class in ASU's engineering curriculum where learners experience what it's like to be guided by a world-class faculty member using industry-relevant tools and real-world examples.

"It is our hope that some of these open-content courses introduce people to a field that fascinates them and makes them want to learn more," Low says. "We want them to think of ASU when they think of upskilling."

From online to on track

By embedding high-quality instruction into an accessible format, Montgomery's online course has become a beacon of ASU's excellence in industrial engineering and engineering management that has impacted tens of thousands of students.

And while Montgomery may joke that his courses contain no cows, sheep or crop yield studies, they are filled with relevance, rigor and a passion for helping engineers tackle real-world problems.

In reviews, students say that the material is working as intended.

"This course has been incredibly valuable for me. It helped me look at experiments from a structured, analytical perspective," one student wrote. "What I loved most was the balance between theory and application."

[Feng Ju](#), industrial engineering program chair in the School of Computing and Augmented Intelligence, says Montgomery's series offers a front-row seat to the future of engineering education.

"Whether you're a working professional brushing up your skills, a curious learner exploring something new or someone eyeing a graduate degree, this accessible online course series is brought to you by one of the field's most engaging minds," Ju says. "It's an invitation to see what industrial engineering can do and how far a well-designed experiment can take you."

This story originally appeared on [ASU News](#).

Main image



Arizona State University Regents Professor Douglas C. Montgomery holds a copy of the "Design and Analysis of Experiments" textbook. First published in 1976, the book has remained in print for nearly 50 years and is a go-to reference for industrial engineering and engineering management students. The material forms the basis of an online course series now available to learners worldwide at low cost. The upskilling series has attracted more than 38,000 total enrollments since its creation. Photo by Erika Gronek/ASU