The Penn State Architectural Engineering (AE) Department, ranked globally at the top of its field, is offering a Master of Engineering (M.Eng.) degree program specifically crafted for buildings professionals, policy makers, and regulators worldwide who are selected and sponsored by their governments to prepare for leadership roles in building transformation in their home country.

**Courses currently offered:**

430: Indeterminate Structures  
431: Advanced Concrete Design Building  
432: Design of Masonry Structures  
445: Building Retuning  
453: Load and Energy Simulation  
454: Advanced HVAC  
455: Advanced HVAC Design  
456: Solar Energy Building System Design  
457: HVAC Controls  
458: Advanced Acoustics  
459: Measurement Science for High Performance Building Systems  
461: Architectural Illumination Systems & Design  
464: Advanced Architectural Illumination Systems & Design  
466: Computer Aided Lighting & Design  
467: Advanced Building Electrical Systems  
468: Building Electrical and Communication Systems  
470: Residential Building Design & Construction  
471: Construction Management of Residential Building Projects  
472: Building Construction Planning & Management  
473: Building Construction Management Control  
475: Building Construction Engineering I  
476: Building Construction Engineering II  
530: Computer Modeling of Building Structures  
531: Legal Aspects of Engineering and Construction  
534: Analysis and Design of Steel Connections  
535: Historical Structural Design Methods  
537: Building Performance Failures and Forensic Techniques  
538: Earthquake Resistant Design of Buildings  
542: Building Enclosure Science and Design  
543: Research Methods in Architectural Engineering  
551: Combined Heat and Power System Design for Buildings  
552: Air Quality in Buildings  
553: Building Energy Analysis  
555: Building Automation and Control Systems  
556: Solar Engineering of Thermal Processes  
557: Centralized Cooling Production and Distribution Systems  
558: Centralized Heating Production and Distribution Systems  
559: Computational Fluid Dynamics in Building Design  
561: Science of Light Sources  
562: Luminous Flux Transfer  
563: Luminaire Optics  
565: Daylighting  
570: Production Management in Construction  
571: International Construction Management and Planning  
572: Project Development and Delivery Planning  
579: Sustainable Building Project Leadership  
581: Facilities Management Information Systems

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The goal of the program is to bring together the best minds from around the world to work collaboratively in an innovation ecosystem to collectively develop solutions to the most pressing infrastructure engineering problems around the world.

This program will provide the most advanced training, built around a demanding 30-credit core curriculum in ultra-high-performance buildings, and is tailored to prepare each student to develop solutions that address the specific needs of the home country and the responsibilities the student will assume at home upon completion of the degree.

The program is part of Penn State’s expanding UN-focused effort to support worldwide transformation of the building sector to ultra-high-performance buildings as envisioned by the United Nations Ultra-High-Performance Building Initiative, administered by the United Nations Economic Commission for Europe.

The 12-month program of study will launch in the fall 2019 semester as an intensive one-year initiative, with students graduating at the end of the summer 2020 semester. Students should have undergraduate training in engineering or other related disciplines that cover thermodynamics, solid mechanics, and/or illumination.

CURRICULUM

All students will gain core knowledge in four key areas. This core curriculum involves four three-credit courses:

- **Core Knowledge #1**: Building Systems Integration: Envelope, Thermal, Mechanical, and Energy Sourcing (3 credits)
- **Core Knowledge #2**: Lighting, Daylighting, Envelope, and Controls (3 credits)
- **Core Knowledge #3**: Occupant Behavior and Building Responsiveness to Occupants and Environment (3 credits)
- **Core Knowledge #4**: Sensors, Data Science, Performance Assessment, and Smart Building Management (3 credits)

In addition, students will, in collaboration with their home governments, participate in two “hands on” practicum courses (3 credits each) to serve as a cornerstone and capstone for their curriculum. The practicum course content will vary based on each student’s specific challenges in which the student will be engaged upon return to their home country, which will be part of the application process. Topics can include technical, legal, regulatory, financial, or other dimensions of the building stock transformation challenge. The cornerstone and capstone courses must be approved by the AE department prior to matriculation and will be taken in the first (fall) and third (summer) semesters, respectively.

Four additional three-credit courses, for a required total of 30 credit hours, will be selected from courses offered by the AE department or other departments within the University offering instruction relevant to students’ objectives, with offerings ranging from community development, policy, and law to real estate and other branches of engineering. All selections and overall curriculum design must be approved by the AE department.

Women and students from minority communities are especially urged to apply for admission to the program, as are individuals with responsibilities in law, regulation, urban planning, design, construction, real estate development, economic development, and sustainability.

ADMINISTRATION

Applications must be submitted to the Penn State Graduate School by April 15 or September 15 of each year, accompanied by three letters of recommendation and the results of applicants’ Graduate Record and Test of English as a Foreign Language (TOEFL) Examinations.

ae.psu.edu