

Courses currently offered:

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



Master's in Architectural Engineering Degree

Ultra-High-Performance Buildings Emphasis

For students recommended and sponsored by home governments to prepare for their future service.

The Penn State Architectural Engineering 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.



PennState
College of Engineering

**ARCHITECTURAL
ENGINEERING**

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ENGINEERING**

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 provides 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.

Students should have undergraduate training in engineering or other related disciplines that cover thermodynamics, solid mechanics, and/or illumination to embark on this **12-month program of study**.



Students committed to equity and inclusivity 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



Penn State consistently ranks in the top 1% of institutions worldwide.

Visit stats.psu.edu for a statistical snapshot of the University.



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 students' 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 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 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 department.

The M.Eng. degree program in architectural engineering at Penn State combines key core competencies with wide ranging substantive flexibility. It is designed to create tailored collaboration among students, home governments, and Penn State in developing the knowledge and skills required to lead building sector transformation. Special provisions can be made for either background training in areas not covered by prior education or to offer students opportunities for highly advanced work in areas of special interest.