

## AE Department Undergraduate Electives

Course No.	Course Title	C	L/E	M	S
Recommended Disciplinary Opportunities within Architectural Engineering Department					
AE 430	Indeterminate Structures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
AE 431	Advanced Concrete Design Building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
AE 432	Design of Masonry Structures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AE 440	BIM Data Management and Analytics for Multi-disciplinary Integration	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
AE 445	<del>Building Retuning</del> [NECA Competition]	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
AE 447	Ultra-High Performance Buildings: Passive House Principles & Design	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 448 (497)	Parametric Thinking and Modeling for Design	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
AE 453	Load and Energy Simulation	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 454	Advanced HVAC	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 455	Advanced HVAC Design	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 457	HVAC Controls	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 458	Advanced Acoustics	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
AE 459	Measurement Science for High Performance Building Systems	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 461	Architectural Illumination Systems & Design	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 462	Lighting Controls	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 463	Daylighting Analysis of Roman Architecture (Rome)	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 464	Advanced Architectural Illumination Systems & Design	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 466	Computer Aided Lighting & Design	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
AE 467	Advanced Building Electrical Systems	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 468	Building Electrical and Communication Systems	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AE 469	Photovoltaic Systems Design and Construction	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Course No.	Course Title	C	L/E	M	S
AE 470	Residential Building Design & Construction	○	▣	▣	▣
AE 471	Construction Management of Residential Building Projects		▣	▣	▣
AE 472	Building Construction Planning & Management	●	○	○	○
AE 473	Building Construction Management Control	●	○	○	○
AE 475	Building Construction Engineering I	●	○	○	◐
AE 476	Building Construction Engineering II	●	○	◐	○
AE 477 (497)	Material Science for Architectural Engineers	●	○	○	◐
AE 494H	Honors Thesis (limited to 3 credits)	◐	◐	◐	◐
AE 497	Lighting Applications	○	◐	○	○
AE 497 *	Sustainable Materials and Structures	◐	◐	◐	◐
AE 498	MDID Studio (Elective if student has completed ARCH 441)	◐	◐	◐	◐
AE 496	Independent Study (requires approval from an AE faculty)	○	○	○	○
*This course has been transferred to the graduate level for the next offering					

<b>Allowable Interdisciplinary Opportunities across Penn State Campus</b> (pre-approved non-AE technical electives; advisor consultation not needed)					
Course No.	Course Title	C	L/E	M	S <input type="checkbox"/>
ARCH 481	Digital Design Media (requires approval of instructor)		◐		
BE 462	Design of Wood Structures				◐
CE 410	Sustainable Residential Subdivision Design				
CE 441	Structural Design of Foundations				◐
CE 447	Structural Analysis by Matrix Methods				◐
EDSGN 401	Engineering Systems Design	○			
EGEE 437	Design of Solar Energy Conversion Systems	○		◐	○
EMCH 402	Applied and Experimental Stress Analysis				◐
EMCH 416	Failure and Failure Analysis of Solids				◐
EMCH 461	Finite Elements in Engineering				◐
EMCH 471	Engineering Composite Materials				◐
ENGR 407	Technology-Based Entrepreneurship	▣	▣	▣	▣
ENGR 408	Leadership Principles	▣	▣	▣	▣
ENGR 409 (US)	Leadership in Organizations	▣	▣	▣	▣
ENGR 411	Entrepreneurship Business Basics	▣	▣	▣	▣
MATSE 440	Non-Destructive Testing			○	◐
ME 444	Engineering Optimization			○	◐
PSYCH 253	Introduction to Psychology of Perception		◐		○
PSYCH 484	Work Attitudes & Motivation (note: PSYCH 100 prerequisite)	○			
PSYCH 485	Leadership in Work Settings	○	○		
RM 303	Real Estate Risk Management	○			
THEA 270	Introduction to Lighting Design		◐		
THEA 470	Advanced Topics in Lighting Design		◐		

● – **Required course** for the option indicated. May be a department elective for other options.

● – **Required course** (student can choose which of the two to take).

◐ – **Recommended elective** for students in the option indicated.

○ – **Allowable elective.** Student should review course selection with advisor.

■ - Allowable Department Elective for students enrolled in the minor (Residential Construction or Engineering Leadership Development). Otherwise, with advanced written approval by a faculty option advisor.

**BLANK** - not recommended (requires advanced written approval by a faculty option advisor)

➤ The following may be acceptable with advanced approval of your academic advisor and an approved petition:

AE 500-level course may be acceptable upon approval by advisor.

Some other CE 400 & 500-level courses may be accepted with advisor consultation.

Some other ME 400 & 500-level courses may be accepted with advisor consultation.

➤ 3 credits of ROTC may be used as Department Elective, and an additional 3 credits of ROTC may be used for GWH credit. Student must be commissioned as an officer upon graduation to qualify for the 6 credits of substitution.

➤ The number of department electives needed by option, faculty prefer that at least two of the elective courses be taken from the 'recommended' technical electives indicated:

- Construction: 8 (9 if taking AE 477/497-Materials for Arch Engr for 3 credits)
- Lighting/Electrical: 15
- Mechanical: 9
- Structural: 12