

Co-Terminal Degree Proposal, Form 802 Attachment

Bachelor of Science in Architectural Engineering

Master of Engineering in Energy Systems

Undergraduate Program

Undergraduate Program Type: Bachelor of Science in Architectural Engineering

Total Undergraduate Program Credit Hours (including shared credit): 131 hours

Program Description: The objective of the architectural engineering program is to prepare graduates to enter and be successful in the architectural engineering profession. Graduates are expected to become licensed professional engineers, and to reach responsible positions in a wide range of professional settings, including consulting firms, industry, or government. This program will prepare students to begin and successfully complete graduate studies in engineering and/or post-baccalaureate education in a professional degree program. The architectural engineering program provides breadth in core sub-disciplines and depth in at least one area of specialization.

Program Purpose: The co-terminal program between the BS in Architectural Engineering and Master of Engineering in Energy systems (MES) allows students interested in energy system applications to enter the job force very competitively positioned to pursue these opportunities within energy-focused industries.

Program Benefits: The Master of Engineering in Energy systems degree was one of six new interdisciplinary engineering degrees approved for Fall 2017. These interdisciplinary degrees reflect contemporary shifts in engineering education and increase the attractiveness of IIT with potential graduate students. By offering these new interdisciplinary graduate degrees as co-terminal programs with our current undergraduate degrees, we are providing our current undergraduate engineering students a path to greater competitiveness while they retain undergraduate financial aid benefits. Furthermore, engineering transfer students often face significant course sequencing challenges within engineering curriculums. Some transfer students solve this problem by pursuing co-terminal programs, and some choose to leave IIT. This co-terminal program will increase the options available to transfer students and potentially improve retention.

Course requirements and sample curriculum: Course requirements and a sample curriculum are included in this document.

Competitive Programs: BS ARCE is a competitive degree offered by many institutions. However, most schools do not offer a co-terminal BS ARCE and engineering management.

Market Analysis: BS ARCE is a competitive degree offered by many institutions. The Master of Engineering in Energy systems is a new degree program (Fall 2017). Please refer to the market analysis for the MES degree provided in the 2017 degree program application for further information.

Marketing and Advertising: Both degrees are currently marketed. The co-terminal degree will be included in current co-terminal degree marketing and additional marketing by the Armour College of Engineering.

Enrollment Estimates: Estimated enrollment in this co-terminal program is 2-4 new students/year.

Retention Estimates: It is anticipated that retention may be improved for transfer students as the co-terminal program allows more flexibility for scheduling each semester.

Economic Analysis: There are no additional costs for the co-terminal program. It is expected that this co-terminal program will draw from a group of students separate from those who pursue the other ARCE co-terminal programs. Therefore, it is expected that additional tuition revenue will be generated equivalent to 24 credits/student enrolled in the program.

Graduate Program

Graduate Program: Master of Engineering in Energy systems

Program Overview: With its reputation as having the first microgrid energy-distribution system of its kind in the country, Illinois Tech is well equipped to prepare students to meet the challenges of generating, storing, and converting energy. Microgrid Design and Operation is one of the courses offered in the energy conservation and buildings specialty within the Master of Engineering in Energy Systems program. Two additional specialty tracks—energy generation and sustainability, and energy transmission and markets—are taught by faculty who have set the bar in energy systems and will empower students to become the next energy pioneers. This proposal is specific to the Energy Conservation & Buildings Specialization.

Program Justification: The Armour College of Engineering is committed to be a lifelong educational partner with our community, from pre-college to professional advancement. The MES degree program contributes to this commitment by enhancing the overall offerings within the Armour College of Engineering. It is anticipated that approximately 20 students will enroll in the MES program Fall 2018. The BS co-terminal degree is anticipated to add 2-4 additional students. A detailed justification for the MES program can be found in the 2017 MES degree application.

Program Resources: The co-terminal program does not require additional resources. The MES curriculum includes existing courses and a few new courses that will be developed according to program demand.

Program description: A detailed list of courses required for each track in the co-terminal degree follows. Students should have a 3.0 GPA in order to be accepted into the co-terminal program. Students will be accepted into the program beginning Fall 2018.

Description of courses shared between Undergraduate and Graduate programs:

a) Shared required courses: none

b) Shared elective courses:

UG: (2) CAE elective courses as GRAD: (2) Track or Elective CAE Courses

c) Course substitutions or exceptions:

Students are responsible for ensuring that any prerequisite courses are completed prior to enrolling in required courses in the co-terminal program of study.

Bachelor of Science in Architectural Engineering

Required Courses

	Credit Hours		
	<i>UG</i>	<i>grad</i>	<i>total</i>
Architectural Engineering Core Requirements	48	0	48
CAE 100, 101, 105, 110, 111, 209, 303, 304, 307, 315, 323, 331, 383, 461, 464, 468, 470, 471			
Master of Engineering in Energy systems Core Requirements (9 cr)	0	9	9
MMAE 522, CHE 543, ECE 418			
Energy Conservation & Buildings Specialization^a (select 4 courses min)	6	12	12
CAE 513, 515, 526, CHE 541, ECE 580, 581, 581, MMAE 525			
Master of Engineering in Energy systems Electives^a (9 cr)	0	9	9
Additional courses from any specialization			
Engineering Course Requirement	6	0	6
CAE 286, 287			
Physics Requirements	8	0	8
PHYS 123, 221			
Chemistry Requirements	4	0	4
CHEM 124			
Computer Science Requirements	2	0	2
CS 104 or 105			
CAE Technical Elective (9 cr)	3	6	9
CAE Additional Science Requirements	3	0	3
CAE 208			
Capstone Design Requirements	3	0	3
CAE 495			
Mathematics Requirements	21	0	21
CAE 312, MATH 151, 152, 251, 252			
Humanities Requirements	3	0	3
AAH 119 or 120			
Humanities and Social Science Requirements	18	0	18
I PRO	6	0	6
Total	131	30	155
(131 ARCE UG) + 30 (MES) -6 (shared credits) = 155 (total)			

^ashared courses between undergraduate and graduate curricula (6 cr)

(2) CAE MES courses as (2) UG electives

Sample Schedule

Semester 1	Credits	Semester 2	Credits
CAE 100	2	CAE 101	2
CAE 110	1	CAE 111	1
CAE 105	3	MATH 152	5
MATH 151	5	CS 104 or 105	2
CHEM 124	4	PHYS 123	4
Humanities 200- level Course	3	Social Science Elective	3
Total	18	Total	17
Semester 3	Credits	Semester 4	Credits
CAE 208	3	CAE 209	3
CAE 286	3	CAE 287	3
PHYS 221	4	CAE 312	3
MATH 251	4	MATH 252	4
AAH 119	3	Social Science Elective (300+)	3
Total	17	Total	16
Semester 5	Credits	Semester 6	Credits
CAE 303	3	CAE 307	3
CAE 304	3	CAE 323	3
CAE 315	3	CAE 464	3
CAE 331	3	IPRO Elective II	3
CAE 383	3	Humanities Elective (300+)	3
IPRO Elective I	3		
Total	18	Total	15
Semester 7		Semester 8	
CAE 461	3	CAE 471	3
CAE 468	3	CAE 495	3
CAE 470	3	CHE 543	3
ECE 418	3	MES Track	3
MMAE 522	3	MES Track	3
Total	15	Total	15
Semester 9		Semester 10	
MES Track	3	CAE Technical Elective	3
MES Elective	3	Social Science Elective (300+)	3
MES Elective	3	MES Track	3
Humanities Elective (300+)	3	MES Elective	3
Total	12	Total	12