



EGN 3343	Thermodynamics I <sup>1</sup>	3
EML 3126	Transport Phenomena <sup>1</sup>	3
	<b>and</b>	
EML 3126L	Transport Phenomena Lab <sup>1</sup>	1
EML 4140	Heat Transfer	3
<sup>1</sup> Students who have taken equivalent course/courses will be exempted from taking these courses. However, they need to select courses from the following list to satisfy the minimum requirement of 15 credit hours for the minor:		
EML 3101	Thermodynamics II	3
EML 4706	Design of Thermal and Fluid Systems	3
EML 4601	Principles of Refrigerating and Air Conditioning	3
	<b>and</b>	
EML 4601L	Refrigeration and A/C Lab	1
EML 4721	Introduction to Computational Thermo-Fluids	3

### Minor in Engineering Science

Fully enrolled non-mechanical engineering undergraduate students, who have at least a junior status with a cumulative FIU Grade Point Average of 2.0 or better, may apply to the department of Mechanical and Materials Engineering to request a minor in Engineering Science. To earn a minor in Engineering Sciences students must complete the 16 credit hours listed below with a minimum grade of "C" in each course.

EGN 3311	Statics <sup>1</sup>	3
EGN 3321	Dynamics <sup>1</sup>	3
EGN 3365	Materials in Engineering	3
EMA 3702	Mechanics and Materials Science <sup>1</sup>	3
	<b>and</b>	
EMA 3702L	Mechanics and Materials Science Lab <sup>1</sup>	1
	<b>or</b>	
EML 3126	Transport Phenomena <sup>1</sup>	3
EML 3126L	Transport Phenomena Lab <sup>1</sup>	1
EGN 3343	Thermodynamics I <sup>1</sup>	3

<sup>1</sup>Students who have taken equivalent course/courses will be exempted from taking these courses. However, they will need to select courses from the following list to satisfy the minimum requirement of 15 credit hours for the minor:

EML 3500	Mechanical Design I	3
EML 4220	Mechanical Vibrations	3
EML 3101	Thermodynamics	3
EML 4140	Heat Transfer	3

### Minor in Mechanical Design

Fully enrolled non-mechanical engineering undergraduate students, who have at least a junior status with a cumulative FIU Grade Point Average of 2.0 or better, may apply to the department of Mechanical and Materials Engineering to request a minor in Mechanical Design. To earn a minor in Mechanical Design students must complete the 16 credit hours work listed below with a minimum grade of "C" in each course.

EGN 3311	Statics <sup>1</sup>	3
EGN 3365	Materials in Engineering <sup>1</sup>	3
EMA 3702	Mechanics and Materials Science	3
	<b>and</b>	
EMA 3702L	Mechanics and Materials Science Lab	1
EML 3500	Mechanical Design I	3
EML 4501	Mechanical Design II	3

<sup>1</sup>Students who have taken equivalent course/courses will be exempted from taking these courses. However, they need to select courses from the following list to satisfy the minimum requirement of 15 credit hours for the minor:

EML 2030	Software for Mechanical Design	3
EGM 4350	Finite Element Analysis in Mechanical Design	3
EML 4804	Introduction to Mechatronics	3
EML 4806	Modeling and Control of Robots	3

### Minor in Robotics and Mechatronics

Fully enrolled non-mechanical engineering undergraduate students, who have at least a junior status with a cumulative FIU Grade Point Average of 2.0 or better, may apply to the department of Mechanical and Materials Engineering to request a minor in Robotics and Mechatronics. To earn a minor in Robotics and Mechatronics students must complete the 16 credit hours work listed below with a minimum grade of "C" in each course.

EGN 3311	Statics <sup>1</sup>	3
EGN 3321	Dynamics <sup>1</sup>	3
EML 3301L	Instrumentation and Measurement Lab	1
EMA 3702	Mechanics and Materials Science <sup>1</sup>	3
EML 4804	Introduction to Mechatronics	3
EML 4806	Modeling and Control of Robots	3

<sup>1</sup>Students who have taken equivalent course/courses will be exempted from taking these courses. However, they need to select courses from the following list to satisfy the minimum requirement of 15 credit hours for the minor:

EML 2030	Software for Mechanical Design	3
EML 4312	Automatic Control Theory	3
EML 4503	Production Machine Design and Development	3
EML 4535	Mechanical Computer Aided Design <sup>3</sup>	3

### Professional Certificate Program

#### Heating, Ventilating and Air Conditioning Design

**Yong X. Tao**, Associate Professor and Coordinator

This Professional Certificate Program provides both traditional students and practicing professionals with a learning experience that enhances their design capabilities in the HVAC field. The program focuses on both basic engineering science and practical applications of system design. Interested applicants must contact the department chairperson or the coordinator prior to registering for the program.

The Certificate will be awarded to a student who successfully demonstrates competency in:

EGN 3343	Thermodynamics I	3
EIN 3354	Engineering Economy	3
EML 4601	Principles of Refrigerating and Air Conditioning	3
EML 4603	Air Conditioning Design	3
EML 4608C	Mechanical Systems in Environmental Control	3

Some of these courses may require additional prerequisites or permission of the program coordinator.