

General Requirements for Graduation Without Thesis – 48 units total with 3.0 GPA overall:

(All classes must be passed with a grade of C or higher)

- **18 units** Approved graduate level course work in AME, approved by AME academic advisor
 - 4 units AME 525 Engineering Analysis
 - 14 units 500 level courses in AME department
- **18 units** Approved graduate level course work in ISE, approved by ISE academic advisor
 - 12 units of required ISE Core Courses (ISE 500, ISE 515, ISE 544, and ISE 561)
 - 3 units required Engineering Elective (Select one: ISE 530, ISE 536, or ISE 562)
 - 3 units Business/Management Area. 500 level business and/or management course. Advisor approval.
- **12 units** Approved 400 or 500 level elective courses by AME and/or ISE departments
- No more than 5 classes (15 units) at 400 level

Notes: Term course typically offered is (F)=Fall (Sp)= Spring (Su)=Summer + Not Regularly Offered

Ex: AME 436 Energy and Propulsion (Sp) is typically offered in the Spring.

AME Mechanical Engineering Courses

Required AME Courses (4 units):

AME 525 *Engineering Analysis* (F)(Sp)(Su)

Recommended Courses by Specialization: Note Specializations do not appear on transcripts or diplomas

Thermal and Fluid Sciences Track

Combustion Core Courses:

AME 436 *Energy and Propulsion* (Sp)

AME 513 *Principles of Combustion* (F)

AME 514 *Applications of Combustion and Reacting Flows* (Sp)

AME 530a *Dynamics of Incompressible Fluids* (F)

Electives with any emphasis:

AME 530b *Dynamics of Incompressible Fluids* (Sp) +

* AME 526 is recommended prep for AME 535a.

Fluid Dynamics Core Courses:

AME 457 *Engineering Fluid Dynamics* (F)

AME 511 *Compressible Gas Dynamics* (Sp)

AME 530a *Dynamics of Incompressible Fluids* (F)

AME 535a *Intro to Computational Fluid Mechanics* *(F)

AME 535b *Intro to Computational Fluid Dynamics* (Sp) +

Heat Transfer Core Courses:

AME 457 *Engineering Fluid Dynamics* (F)

AME 515 *Advanced Problems in Heat Conduction* (Sp) +

AME 516 *Convective Processes* (Sp) +

AME 517 *Radiation Heat Transfer* (F) +

Design Track

Design Core Courses:

AME 503 *Advanced Mechanical Design* (F)(Su)

AME 505 *Engineering Information Modeling* (Sp)

AME 509 *Applied Elasticity* (Sp)

Recommended Electives:

AME 404 *Mechanical Engineering Problems* (F)

AME 541 *Linear Control Systems II* ^ (F)

CE 529a *Finite Element Analysis* (F)(Su)

AME 451 *Linear Controls Systems I* (F)(Sp) □

ASTE 520 *Spacecraft System Design* (F)(Sp)

SAE 549 *System Architecting* (F)(Sp)(Su)

AME 527 *Elements of Vehicle and Energy Systems Design* (Sp)

ASTE 523 *Design of Low Cost Space Missions* (Sp)

^ AME 451 is pre-req for AME 541.

□ AME 451 is only recommended elective if equivalent not taken during undergrad.

Mechanics and Materials Track

Mechanics and Materials Core Courses:

AME 509 *Applied Elasticity (Sp)*

AME 560 *Fatigue and Fracture (Sp)*

MASC 551 *Mechanical Behavior of Engineering Materials (F)*

Recommended Electives:

AME 588 *Materials Selection (F)*

AME 559 *Creep (F) +*

CE 529a *Finite Element Analysis (F)(Su)*

MASC 534 *Materials Characterization (F)*

MASC 561 *Dislocation Theory and Applications (Sp)*

Dynamics and Control Track

Dynamics and Control Core Courses:

AME 521 *Engineering Vibrations II (F)*

AME 524 *Advanced Engineering Dynamics (F)*

AME 552 *Nonlinear Control Systems ^ (Sp)*

AME 522 *Nonlinear Vibrations (F)*

AME 541 *Linear Control Systems II * (F)*

Recommended Electives:

AME 420 *Engineering Vibrations I (Sp)* □

AME 451 *Linear Control Systems I (F)* □

AME 539 *Multi-body Dynamics (Sp) +*

AME 544 *Computer Control of Mechanical Systems (Sp)*

* AME 451 is pre-req for AME 541. ^ AME 541 is pre-req for AME 552.

□ AME 420 & AME 451 are only recommended electives if equivalent not taken during undergrad.

Energy Track

Energy Core Courses:

AME 430 *Thermal System Design (F)*

AME 577 *Survey of Energy & Power for a Sustainable Future (Sp)*

CE 515 *Sustainable Infrastructure Systems (F)*

AME 578 *Modern Alternative Energy Conversion Devices (F)*

Recommended Electives:

AME 513 *Principles of Combustion (F)*

AME 579 *Combustion Chemistry and Physics (Sp)*

AME 582 *Nuclear Reactor Physics (Sp)*

AME 514 *Applications of Combustion and Reacting Flows (Sp)*

AME 581 *Intro to Nuclear Engineering (F)*

ENE 505 *Energy and Environment (F)(Sp)*

ISE Engineering Management Courses

ISE Required Core Courses (12 units):

ISE 500 *Engineering Management Decisions and Statistics*

ISE 515 *Engineering Project Management*

ISE 544 *Management of Engineering Teams*

ISE 561 *Economic Analysis of Engineering Projects**

Required Engineering Elective

Select one of the following courses (3 units):

ISE 530 *Optimization Methods for Analytics*

ISE 536 *Linear Programming and Extensions*

ISE 562 *Value and Decision Theory*

Business and Management Area

Select one 500 level course (3 units):

Business and/or management content with advisor approval.

ISE Elective Courses

**Please contact Mary Ordaz (mordaz@usc.edu) in ISE for elective recommendations.

* ISE 460 is pre-req for ISE 561.

Program of Study Worksheet

Course	Semester	Notes
AME 525		
ISE 500		
ISE 515		
ISE 544		
ISE 561		
		AME Course
		AME Course
		AME Course
		AME Course
		AME Course
		Required Engineering Elective
		Business/Management Area
		Approved Elective
		Approved Elective
		Approved Elective
		Approved Elective

*To be approved to pursue the MSME/MSEMT with Thesis, you must first discuss with an AME Academic Advisor during your first semester in program. An AME or ISE faculty thesis advisor must be secured by student and special planning of coursework and units must be discussed with AME Academic Advisor.