

**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
  - 6 units AME 525 Engineering Analysis and AME 526 Engineering Analytical Methods
  - 12 units 500 level courses in AME department
- **18 units** Approved graduate level course work in ISE, approved by ISE academic advisor
  - 6 units of required ISE Core Courses (ISE 500 and ISE 561)
  - 12 units approved core courses from MS in Engineering Management program
- **12 units** Approved 400 or 500 level elective courses, approved by AME and/or ISE department
- No more than 5 classes (15 units) at 400 level

**AME Aerospace Engineering Courses**

**Required AME Courses (6 units):**

AME 525 *Engineering Analysis (F)(Sp)(Su)*      AME 526 *Engineering Analytical Methods (F)(Sp)(Su)*

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

**Aerospace Control Track**

**Aerospace Control Core Courses:**

AME 541 *Linear Control Systems II \* (F)*      AME 532a *Flight Vehicle Stability and Control (Sp)*

**Electives:**

AME 451 *Linear Controls Systems I (F)(Sp)* □      AME 544 *Computer Control of Mechanical Systems (Sp)*      AME 545 *Modeling and Control of Distributed Dynamic Systems +*

AME 552 *Nonlinear Control Systems ^ (Sp)*      ASTE 585 *Spacecraft Attitude Control (Su) +*      ASTE 586 *Spacecraft Attitude Dynamics +*

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

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

**Aerospace Design Track**

**Aerospace Design Core Courses:**

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

**Electives:**

AME 408 *Computer-Aided Design of Mechanical Systems (F)(Sp)*      AME 502 *Modern Topics in Aerospace Design (F)*      AME 528 *Elements of Composite Structure Design +*

ASTE 520 *Spacecraft System Design (F)*

**Aerospace Structures Track**

**Aerospace Structures Core Courses:**

AME 529 *Aircraft Structures Analysis (Sp)*      AME 546 *Basic Aeroelasticity +*

**Electives:**

AME 509 *Applied Elasticity \* (Sp)*      AME 521 *Engineering Vibrations II ^ (F)*      AME 559 *Creep +*

AME 560 *Fatigue and Fracture (Sp)*      CE 507 *Mechanics of Solids I (F)*      CE 529a *Finite Element Analysis (F)(Su)*

CE 541a *Dynamics of Structures (F)*

\* AME 403 is pre-req for AME 509.    ^ AME 420 is pre-req for AME 521

**Notes:** Term course typically offered

(F)=Fall (Sp)= Spring (Su)=Summer + Not Regularly Offered Ex: AME 541 *Linear Controls Systems II (F)* is typically offered in the Fall.

## Computational Fluid Dynamics Track

### Computational Fluid Dynamics Core Courses:

AME 511 *Compressible Gas Dynamics (Sp)*      AME 530a *Dynamics of Incompressible Fluids (F)*

### Electives:

AME 457 *Engineering Fluid Dynamics (F)*      AME 530b *Dynamics of Incompressible Fluids (Sp)+*      AME 535a *Introduction to Computational Fluid Mechanics \* (F)*  
AME 535b *Intro to Computational Fluid Mechanics (Sp)+*      AME 620 *Aero and Hydrodynamic Wave Theory+*      AME 621 *Stability of Fluids+*  
AME 651 *Statistical Theories of Turbulence+*      AME 652 *Turbulent Shear Flows+*      ASTE 545 *Computational Techniques in Rarefied Gas Dynamics+*  
Math 504ab *Numerical Solution of Ordinary and Partial Differential Equations+*

\* AME 526 is recommended prep for AME 535a.

## Aerodynamics/Fluid Dynamics Track

### Aerodynamics/Fluid Dynamics Core Courses:

AME 511 *Compressible Gas Dynamics (Sp)*      AME 530a *Dynamics of Incompressible Fluids (F)*

### Electives:

AME 457 *Engineering Fluid Dynamics (F)*      AME 516 *Convection Processes (Sp)+*      AME 535a *Intro to Computational Fluid Mechanics \* (F)*  
AME 537 *Microfluids+*      AME 530b *Dynamics of Incompressible Fluids (Sp)+*      AME 620 *Aero and Hydrodynamic Wave Theory+*  
AME 621 *Stability of Fluids+*      AME 651 *Statistical Theories of Turbulence+*      AME 652 *Turbulent Shear Flows+*

\* AME 526 is recommended prep for AME 535a.

## Propulsion Track

### Propulsion Core Courses:

AME 511 *Compressible Gas Dynamics (Sp)*      AME 513 *Principles of Combustion (F)*

### Electives:

AME 436 *Energy and Propulsion(Sp)*      AME 457 *Fluid Dynamics (F)*      AME 512 *Advanced Thermodynamics+*  
AME 514 *Application of Combustion (Sp)*      ASTE 470 *Spacecraft Propulsion (Sp)*      ASTE 501a *Physical Gas Dynamics+*  
ChE 530 *Thermodynamics for Chemical Engineers (Sp)*

## ISE Engineering Management Courses

### ISE Required Core Courses (6 units):

ISE 500 *Engineering Management Decisions and Statistics*      ISE 561 *Economic Analysis of Engineering Projects\**

### Accounting Elective Courses

#### Select one of the following courses (3 units):

CE 502 *Construction Accounting*      ISE 566 *Financial Accounting for Engineering*

### Engineering Management Elective Courses

#### Select two of the following courses (6 units):

ISE 515 *Engineering Project Management*      ISE 544 *Management of Engineering Teams*      ISE 564 *Performance Analysis*  
ISE 565 *Law and Finance for Engineering Innovation*

### Quantitative Methods Elective Courses

#### Select one of the following courses (3 units):

ISE 513 *Inventory Systems*      ISE 514 *Advanced Production Planning and Scheduling*      ISE 525 *Design of Experiments*  
ISE 527 *Quality Management for Engineers*      ISE 530 *Optimization Methods for Analytics*

\* ISE 500 is pre-req for ISE 561.

**Notes:** Term course typically offered

(F)=Fall (Sp)= Spring (Su)=Summer + Not Regularly Offered Ex: AME 511 *Compressible Gas Dynamics (Sp)* is typically offered in the Spring.

## ISE Elective Courses

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

### Program of Study Worksheet

Course	Semester	Notes
AME 525		
AME 526		
ISE 500		
ISE 561		

\*To be approved to pursue the MSAE/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.