

# Assessment Plan

## Western Michigan University

### Mechanical & Aeronautical Engineering

**Mission Statement:** To provide challenging relevant programs in a continuously improving student-centered education and research environment that motivates students and faculty to create, share, and apply knowledge and experience.

**Vision Statement:** Student-centered engineering programs with scholars providing excellence in education and research.

**Outcome: Graduate Program Learning Outcome - a1,b1**

An ability to apply advanced knowledge of Mathematics to the solution of engineering problems

**Track:** MSE Mechanical Non-Thesis Option  
MSE Mechanical Thesis Option

**Start Date:** 08/20/2009

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Students are required to complete two Mathematics-intensive graduate-level courses <b>Assessment Method Category:</b> Course Grade	100% of students complete their Math requirement with a grade B or better	reviewed at student final audit	Yes

**Outcome: Graduate Program Learning Outcome - a2,b2**

An advanced ability to identify, formulate, and solve engineering problems

**Track:** MSE Mechanical Non-Thesis Option  
MSE Mechanical Thesis Option

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Graduate level coursework <b>Assessment Method Category:</b> Course Grade	100% of students complete at least 2 ME 6xxx level courses with a grade of BA or better	reviewed by the Graduate Advisor in student final audit	Yes

**Outcome: Graduate Program Learning Outcome - b3**

An ability to participate in relevant engineering research culminating in a Master Thesis

**Track:** MSE Mechanical Thesis Option

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Evaluation of thesis by the committee <b>Assessment Method Category:</b> Thesis	100% of students complete their thesis.	Evaluated by the Master's committee during the final defense	Yes

**Outcome: Graduate Program Learning Outcome - b4**

An ability to communicate effectively

**Track:** MSE Mechanical Thesis Option

**Outcome Status:** Active

Means of Assessment			
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Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Written communication: Oral communication: thesis defense <b>Assessment Method Category:</b> Thesis	100% of students complete their thesis.	Evaluated by the Master's committee during the student final defense	Yes

**Outcome: Graduate Program Learning Outcome - b5**

An ability to acquire knowledge of current research and technology in field of specialty.

**Track:** MSE Mechanical Thesis Option

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Literature review in Master thesis	100% of students include an extensive literature review in their thesis	Evaluated by the Master's committee during the student's final defense	Yes

**Outcome: Graduate Program Learning Outcome - c1**

An ability to apply advanced knowledge of Mathematics to the solution of engineering problems

**Track:** PhD Mech Engrg

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Successful completion of Math qualifier exam	100% of graduates pass this exam.	reviewed by the Graduate Advisor	Yes

**Outcome: Graduate Program Learning Outcome - c2**

An advanced ability to identify, formulate, and solve engineering problems

**Track:** PhD Mech Engrg

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Graduate level coursework <b>Assessment Method Category:</b> Course Grade	100% of students complete at least half of their ME 6xxx level courses with a grade of BA or better	reviewed by the Graduate Advisor in student final audit	Yes

**Outcome: Graduate Program Learning Outcome - c3**

An ability to communicate advanced concepts effectively.

**Track:** PhD Mech Engrg

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Research proposal presentation Ph.D. thesis defense	100% of graduates pass both	Determined by the Ph.D. committee during the student Comprehensive Exam and the final defense	Yes

**Outcome: Graduate Program Learning Outcome - c4**

An ability to acquire knowledge of current research and technology in field of specialty.

Track: PhD Mech Engrg

Outcome Status: Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Literature reviews for research proposal and Ph.D. dissertation	100% of students include evaluative literature reviews in their proposal and dissertation	Evaluated by the Ph.D. committee during the student's final defense	Yes

**Outcome: Graduate Program Learning Outcome - c5**

An ability to conduct independent research culminating in a Ph.D. dissertation

Track: PhD Mech Engrg

Outcome Status: Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Ph.D. dissertation <b>Assessment Method Category:</b> Dissertation	Approval of dissertation	This will be carried out by the Ph.D. committee during the final defense	Yes

**Outcome: Graduate Program Learning Outcome - c6**

An ability to evaluate the contributions of others to field of specialty.

Track: PhD Mech Engrg

Outcome Status: Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Literature reviews for research proposal and Ph.D. dissertation <b>Assessment Method Category:</b> Dissertation	100% of students include evaluative literature reviews in their proposal and dissertation	Ph.D. committee evaluates the depth of the literature review	Yes

**Outcome: Undergraduate Program Outcome 1-ME**

An ability to apply knowledge of advanced mathematics through multivariate calculus and differential equations

Track: BSE Mechanical

Outcome Status: Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics	Twice a year, in October and April	Yes
Alumni Survey	The survey scale for the degree of preparation at WMU is "Very Well Prepared", "Well Prepared", "Somewhat Prepared", and "Not Prepared". The criterion is that 80% of the responses must be at "Prepared" and above "Prepared" ranking.	Once every three years	Yes

### Related Courses

- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 371 - Fundamentals of Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 463 - Aircraft Structural Design
- \* AAE 466 - Aeronautical Propulsion Systems
- \* AAE 469 - Aircraft Design
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 232 - Thermodynamics I
- \* ME 250 - Materials Science
- \* ME 256 - Statics
- \* ME 257 - Mechanics of Materials
- \* ME 258 - Dynamics
- \* ME 335 - Mechanical Engineering Lab
- \* ME 356 - Fluid Mechanics
- \* ME 358 - Mechanism Analysis
- \* ME 360 - Control Systems
- \* ME 362 - Theory of Engineering Experimen.
- \* ME 365 - Machine Design I
- \* ME 367 - Internal Combustion Engines I
- \* ME 431 - Heat Transfer
- \* ME 432 - Thermodynamics II
- \* ME 433 - Environmental Systems Design in Build.

- \* ME 439 - Design of Thermal Systems
- \* ME 459 - Dynamics of Machinery
- \* ME 465 - Vehicle Dynamics
- \* ME 467 - Internal Combustion Engines II
- \* ME 468 - Engine Design
- \* ME 470 - Vehicle Structural Design
- \* ME 471 - Motion and Control
- \* ME 480 - Mech./Aero. Eng. Project
- \* ME 481 - Vehicle Design
- \* ME 555 - Intermediate Dynamics
- \* ME 558 - Mechanical Vibrations
- \* ME 564 - Engineering Noise Control
- \* ME 573 - Engineering Materials
- \* ME 575 - Tribology

**Outcome: Undergraduate Program Outcome 2**

An ability to apply knowledge of science

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics.	Twice a year, in October and April	Yes

**Related Courses**

- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 371 - Fundamentals of Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 459 - Design Elective
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 463 - Aircraft Structural Design
- \* AAE 466 - Aeronautical Propulsion Systems
- \* AAE 469 - Aircraft Design
- \* ME 220 - Processes & Materials in Manuf.

- \* ME 232 - Thermodynamics I
- \* ME 256 - Statics
- \* ME 257 - Mechanics of Materials
- \* ME 258 - Dynamics
- \* ME 335 - Mechanical Engineering Lab
- \* ME 356 - Fluid Mechanics
- \* ME 358 - Mechanism Analysis
- \* ME 360 - Control Systems
- \* ME 362 - Theory of Engineering Experimentation.
- \* ME 365 - Machine Design I
- \* ME 367 - Internal Combustion Engines I
- \* ME 431 - Heat Transfer
- \* ME 432 - Thermodynamics II
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 453 - Machine Design II
- \* ME 457 - Experimental Solid Mechanics
- \* ME 459 - Dynamics of Machinery
- \* ME 465 - Vehicle Dynamics
- \* ME 467 - Internal Combustion Engines II
- \* ME 468 - Engine Design
- \* ME 470 - Vehicle Structural Design
- \* ME 471 - Motion and Control
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 480 - Mech./Aero. Eng. Project
- \* ME 553 - Advanced Product Design
- \* ME 555 - Intermediate Dynamics
- \* ME 575 - Tribology

**Outcome: Undergraduate Program Outcome 3**

An ability to apply knowledge of engineering

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes

**Related Courses**

- \* AAE 250 - Aerospace Materials

- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 250 - Materials Science
- \* ME 356 - Fluid Mechanics
- \* ME 439 - Design of Thermal Systems
- \* ME 467 - Internal Combustion Engines II
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 553 - Advanced Product Design
- \* ME 573 - Engineering Materials
- \* ME 575 - Tribology

**Outcome: Undergraduate Program Outcome 4**

An ability to design and conduct experimnts, as well as to analyze and interpret data

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

<b>Means of Assessment</b>			
<b>Assessment Method</b>	<b>Criterion</b>	<b>Schedule</b>	<b>Active</b>
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics.	Twice a year, in October and April	Yes

**Related Courses**

- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* MATH 3740 - Intro to Linear Algebra & Diff. Eq.
- \* ME 335 - Mechanical Engineering Lab
- \* ME 356 - Fluid Mechanics
- \* ME 358 - Mechanism Analysis
- \* ME 360 - Control Systems
- \* ME 362 - Theory of Engineering Experimen.

- \* ME 431 - Heat Transfer
- \* ME 432 - Thermodynamics II
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 459 - Dynamics of Machinery
- \* ME 465 - Vehicle Dynamics
- \* ME 470 - Vehicle Structural Design
- \* ME 471 - Motion and Control
- \* ME 555 - Intermediate Dynamics

**Outcome: Undergraduate Program Outcome 5**

An ability to design a system, component , or process to meet desired needs within realistic constraints such as economic , environmental, social, political, ethical, health and safety, manufacturibility, and sustainability

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Senior Survey	The weighted average of all responses to the? Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics.	Twice a year, in October and April	Yes

**Related Courses**

- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 371 - Fundamentals of Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 459 - Design Elective
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 463 - Aircraft Structural Design
- \* AAE 466 - Aeronautical Propulsion Systems
- \* AAE 469 - Aircraft Design

**Outcome: Undergraduate Program Outcome 6**

An ability to function on multidisciplinary teams

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Capstone Senior Design	Receive 80% in Project Design, Ethics, Progress and final Reports, and Oral Presentation sections of the course.	Fall and Spring Semesters	Yes
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes

### Related Courses

- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 335 - Mechanical Engineering Lab
- \* ME 362 - Theory of Engineering Experimen.
- \* ME 367 - Internal Combustion Engines I
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 465 - Vehicle Dynamics
- \* ME 468 - Engine Design
- \* ME 470 - Vehicle Structural Design
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 480 - Mech./Aero. Eng. Project
- \* ME 553 - Advanced Product Design

### Outcome: Undergraduate Program Outcome 7

An ability to identify, formulate, and solve engineering problems

**Track:** BSE Aeronautical  
BSE Mechanical

**Start Date:** 07/05/2005

**End Date:** 07/22/2009

**Outcome Status:** Active

### Outcome: Undergraduate Program Outcome 8

An understanding of professional and ethical responsibilities

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Capstone Senior Design	Receive 80% in Project Design, Ethics, Progress and final Reports, and Oral Presentation sections of the course.	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics.	Twice a year, in October and April	Yes
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes
Senior Survey	The weighted average of all responses to the? Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes

### Related Courses

- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 335 - Mechanical Engineering Lab
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 465 - Vehicle Dynamics
- \* ME 479 - Mech./Aero. Eng. Project Plan

### Outcome: Undergraduate Program Outcome 10

An ability to write effectively

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Capstone Senior Design	Receive 80% in Project Design, Ethics, Progress and final Reports, and Oral Presentation sections of the course.	Fall and Spring Semesters	Yes
Senior Survey	The weighted average of all responses to the? Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes

### Related Courses

- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 459 - Design Elective
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 463 - Aircraft Structural Design
- \* AAE 466 - Aeronautical Propulsion Systems
- \* AAE 469 - Aircraft Design
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 232 - Thermodynamics I
- \* ME 256 - Statics
- \* ME 257 - Mechanics of Materials
- \* ME 258 - Dynamics
- \* ME 335 - Mechanical Engineering Lab
- \* ME 356 - Fluid Mechanics
- \* ME 360 - Control Systems
- \* ME 362 - Theory of Engineering Experimen.
- \* ME 365 - Machine Design I
- \* ME 367 - Internal Combustion Engines I
- \* ME 431 - Heat Transfer
- \* ME 432 - Thermodynamics II
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 453 - Machine Design II
- \* ME 457 - Experimental Solid Mechanics
- \* ME 459 - Dynamics of Machinery
- \* ME 468 - Engine Design
- \* ME 470 - Vehicle Structural Design
- \* ME 471 - Motion and Control
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 555 - Intermediate Dynamics
- \* ME 558 - Mechanical Vibrations
- \* ME 564 - Engineering Noise Control
- \* ME 575 - Tribology

### Outcome: Undergraduate Program Outcome 9

A knowledge of contemporary issues

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 14**

An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 13**

A recognition of the need for and an ability to engage in lifelong learning

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes

**Related Courses**

- \* AAE 250 - Aerospace Materials
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 250 - Materials Science
- \* ME 360 - Control Systems
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 459 - Dynamics of Machinery
- \* ME 470 - Vehicle Structural Design
- \* ME 471 - Motion and Control
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 553 - Advanced Product Design
- \* ME 573 - Engineering Materials
- \* ME 575 - Tribology

**Outcome: Undergraduate Program Outcome 12**

An understanding of the impact of the engineering solutions in a global, economic, environmental, and societal context

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes

### Related Courses

- \* AAE 250 - Aerospace Materials
- \* AAE 261 - Intro. to Aeronautical Eng.
- \* AAE 361 - Flight Vehicle Aerodynamics
- \* AAE 450 - Flight Vehicle Performance
- \* AAE 460 - Aircraft Stability and Control
- \* AAE 466 - Aeronautical Propulsion Systems
- \* ME 220 - Processes & Materials in Manuf.
- \* ME 232 - Thermodynamics I
- \* ME 250 - Materials Science
- \* ME 335 - Mechanical Engineering Lab
- \* ME 367 - Internal Combustion Engines I
- \* ME 465 - Vehicle Dynamics
- \* ME 467 - Internal Combustion Engines II
- \* ME 479 - Mech./Aero. Eng. Project Plan
- \* ME 553 - Advanced Product Design
- \* ME 573 - Engineering Materials
- \* ME 575 - Tribology

### Outcome: Undergraduate Program Outcome 11

An ability to speak effectively

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

### Outcome: Undergraduate Program Outcome 15-ME

Familiarity with statistics and linear algebra

**Track:** BSE Mechanical

**Outcome Status:** Active

### Outcome: Undergraduate Program Educational Objective 1

Graduates will have engineering positions or pursue their graduate degrees

**Track:** BSE Aeronautical  
BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 16-ME**

An ability to work professionally in thermal systems including the design and realization of such systems

**Track:** BSE Mechanical

**Outcome Status:** Active

Means of Assessment			
Assessment Method	Criterion	Schedule	Active
Employer Survey	Graduates receive medium to high rankings for quality of preparation.	Once every three years	Yes
Senior Survey	The weighted average of all responses to the "Emphasis Given in the Program" must be above Medium. The ratings are High, Medium, and Low.	Fall and Spring Semesters	Yes
Fundamental of Engineering Exam	Passing rate above 80%. For all subjects tested, the WMU average percent correct statistics is expected to be at the National average percent correct statistics.	Twice a year, in October and April	Yes

**Related Courses**

- \* ME 335 - Mechanical Engineering Lab
- \* ME 356 - Fluid Mechanics
- \* ME 362 - Theory of Engineering Experiment.
- \* ME 365 - Machine Design I
- \* ME 367 - Internal Combustion Engines I
- \* ME 431 - Heat Transfer
- \* ME 432 - Thermodynamics II
- \* ME 433 - Environmental Systems Design in Build.
- \* ME 439 - Design of Thermal Systems
- \* ME 453 - Machine Design II
- \* ME 465 - Vehicle Dynamics
- \* ME 467 - Internal Combustion Engines II
- \* ME 468 - Engine Design
- \* ME 480 - Mech./Aero. Eng. Project
- \* ME 481 - Vehicle Design
- \* ME 530 - Theoretical and Comp. Fluid Mech.
- \* ME 573 - Engineering Materials
- \* ME 575 - Tribology

**Outcome: Undergraduate Program Outcome 1-AE**

An ability to apply knowledge of mathematics

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 15-AE**

A knowledge of aerodynamics

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 16-AE**

A knowledge of aerospace materials and structures

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 17-AE**

A knowledge of propulsion

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 17-ME**

An ability to work professionally in mechanical systems including the design and realization of such systems

**Track:** BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 18-AE**

A knowledge of flight mechanics and stability and control

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 2-ME**

Graduates will apply their broad and fundamental knowledge to solve relevant problems in the field of mechanical engineering or related fields

**Track:** BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 3**

Graduates will consider professional and ethical responsibilities and the impact of engineering solutions in a global and societal context

**Track:** BSE Aeronautical

BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 4**

Graduates will maintain their knowledge of contemporary issues and engage in lifelong learning

**Track:** BSE Aeronautical

BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 5-ME**

Graduates will function well on teams and communicate effectively in the field of mechanical engineering or related fields

**Track:** BSE Mechanical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 2-AE**

Graduates will apply their broad and fundamental knowledge to solve relevant problems in the field of aeronautical engineering or related fields

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Educational Objective 5-AE**

Graduates will function well on teams and communicate effectively in the field of aeronautical engineering and related fields

**Track:** BSE Aeronautical

**Outcome Status:** Active

**Outcome: Undergraduate Program Outcome 19-AE**

Design competence that includes integration of aeronautical topics

**Track:** BSE Aeronautical

**Outcome Status:** Active