

Outcome E. Graduates will have an ability to identify, formulate and solve engineering problems.

Course	Performance indicators
MAE 243, 320, 321, 342, 454, 456, 460	Capability to identify an engineering problem from a layman’s need.
MAE 243, 320, 321, 342, 454, 456, 460	Formulate and problem with engineering principles of mechanics.
MAE 243, 320, 321, 342, 454, 456, 460	Solve a problem using engineering methods, tools and instruments.
MAE 243, 320, 321, 342, 454, 456, 460	Grade distribution.

- Tools used: Course assessment by faculty, Alumni survey, Employer survey.
- Data Collection: The data are collected every semester based on the course offerings.
- Frequency of data collection: The data are collected every time courses are taught.
- Data Analysis: The data obtained are analyzed every year.

Closing the loop: This outcome is subject to review every year based on performance criteria and metrics and specific action items are developed, if necessary, to revise the content of the courses. The analyzed data are presented separately to the following groups in meetings.

- a) Feedback to students on all assignments
- b) Feedback to faculty, particular from majors.

Outcome and Performance Indicator		Performance Indicator Rubric				
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”		Poor	Fair	Good	Very Good	Excellent
PI1	Capability to identify an engineering problem from a layman’s need	No effort in identifying an eng. problem	Slight ref. to the eng. nature of a problem	Clear indication of the prob. nature	Eng. Concepts used to define prob.	Eng. Concepts used to define prob. and explained
PI2	Formulate and problem with engineering principles of mechanics	Formulation absent	Form. poorly presented	Form. Mentioned but not developed	Form. used with equations	Form. used with equations and explanations
PI3	Solve a problem using engineering methods, tools and instruments	Solution unexplained	Attempt to use a sol. method	Some sol. method applied	Sol method correctly applied	Sol. method correct and explained
PI4	Grade distribution	1 (F)	2 (D)	3 (C)	4 (B)	5 (A)

Explanations:

Performance Indicator 1. (PI1). “Capability to identify an engineering problem from a layman’s need.” Engineering problems are often posed to solve specific needs. In the search of an engineering solution it is often necessary to identify the nature of the problem to be addressed and the nature of the system to deal with in order to establish operational, constraint and performance parameters. The following rubrics are used to assess this indicator:

- **Poor.** This rubric is used when there is no evidence of an effort made to establish or describe the nature of a particular problem or system or approach to follow.
- **Fair.** This rubric is used when there is some description of the nature and characteristics of a problem, a system or an engineering approach to apply.

- **Good.** This rubric is used when there is a clear description of the nature and characteristics of a problem, a system or an engineering approach in such a way that a clear path to a formulation and solution may result as a consequence.
- **Very Good.** This rubric is used when there is a clear description of the nature and characteristics of a problem, a system or an engineering approach in such a way that a clear path to a formulation and solution is produced.
- **Excellent.** This rubric is used when in addition to the previous rubric there is an explanation or arguments that illustrate how the nature of the problem, system or approach was arrived at.

Performance Indicator 2. (PI2). “Formulate a problem with engineering principles of mechanics.” Engineering problems can be solved only after a mathematical formulation based on principles of mechanics has been developed for the problem at hand: The following rubrics are used to assess this indicator:

- **Poor.** This rubric is used when there is no evidence of an effort made to establish a formulation, producing a weak connection between the problem being addressed and the steps leading to a possible solution.
- **Fair.** This rubric is used when there is an attempt to establish a formulation which somehow connects the problem being addressed and provides a path towards a possible solution.
- **Good.** This rubric is used when there is a clear approach for establishing a formulation based on principles of mechanics which leads to a solution approach for the engineering problem being addressed.
- **Very Good.** This rubric is used when there is a clear approach for establishing a formulation based on principles of mechanics and a procedure described to reach a solution anticipating possible scenarios.
- **Excellent.** This rubric is used when in addition to the previous rubric there is an explanation or arguments that illustrate how the formulation was arrived at or developed.

Performance Indicator 3. (PI3). “Solve a problem using engineering methods, tools and instruments.” Engineering problems ultimately call for solutions which can be obtained by applying engineering and mathematical procedures, tools, instruments and techniques aimed at producing results, which in turn represent a solution to the problem at hand. The following rubrics are used to assess this indicator:

- **Poor.** This rubric is used when a solution is not attained or appears to be flawed, or when the solution offered does not actually reflect the nature of the problem at hand.
- **Fair.** This rubric is used when only a partial solution is attained leaving important aspects or constraints of the problem unaddressed, underestimated or mistreated.
- **Good.** This rubric is used when a solution is attained which satisfies the basic performance requirements, without violating any of the constraints.
- **Very Good.** This rubric is used when a solution is attained which satisfies the basic performance requirements, without violating any of the constraints and provides evidence that it is the best possible solution.
- **Excellent.** This rubric is used when in addition to the previous rubric there is a clear description of how the solution was arrived at, and the rationale behind it.

Performance Indicator 4. (PI4). Grade distribution from class on applicable assignments or exercises. A, B, C, D ,F

Assessment Tool:

Course Assessment Rubric by Faculty

Mechanical Engineering Program Course-Outcome Matrix (October 2014)

ABET Outcome		a	b	c	d	e	f	g	h	i	j	k	
Required Course	Credit Hours	Apply Math, Science, and Engr	Design Experiments and Analyze and	Design System, Component, or Process	Multi-disciplinary Teams	Identify, Formulate and Solve Engr Problems	Professional and Ethical Responsibility	Communicate Effectively	Broad Education - Global and Societal	Life-long Learning	Contemporary Issues	Techniques, Skills, and Modern Engr Tools	Number of Outcomes per course
ENGR 101 <i>Engr. Problem Solving 1</i>	3						F	G					2
MAE 211 <i>Mechatronics</i>	3			C	D								2
MAE 241 <i>Statics</i>	3	A											1
MAE 242 <i>Dynamics</i>	3	A											1
MAE 243 <i>Mech. of Materials</i>	3					E							1
MAE 244 <i>Dynam. & Strength Lab</i>	1		B		D							K	2
MAE 316 <i>Analy. of Engr. Sys.</i>	3	A										K	2
MAE 320 <i>Thermodynamics</i>	3					E			H		J		3
MAE 321 <i>Applied Thermodynamics</i>	3					E					J		2
MAE 322 <i>Thermal and Fluids Lab.</i>	3		B					G					2
MAE 331 <i>Fluid Mechanics</i>	3	A									J		2
MAE 342 <i>Dynamics of Machines</i>	3					E	F						2
MAE 343 <i>Intermed. Mech. Matls.</i>	3	A								I			2
MAE 411 <i>Advanced Mechatronics</i>	3		B									K	2
MAE 423 <i>Heat Transfer</i>	3			C					H		J		3
MAE 454 <i>Machine Design and Mfg.</i>	3			C		E				I			3
MAE 456 <i>CAD & Finite Elem. Ana.</i>	3			C		E						K	3
MAE 460 <i>Automatic Controls</i>	3					E						K	2
MAE 471 <i>Prin. of Engr. Design</i>	3			C	D		F	G					4
No. of courses/outcome	55	5	3	5	2	7	3	3	2	2	4	5	
MATH 155 <i>Calculus 1</i>	4	r											
CHEM 115 <i>Fund. of Chemistry</i>	4	r	r				r						
ENGR 199 <i>Orientation to Engr.</i>	1	r		r		r	r	r		r	r		
ENGL 101 <i>Composition and Rhetoric</i>	3							r					
MATH 156 <i>Calculus 2</i>	4	r								r			
ENGR 102 <i>Engr. Problem Solving 2</i>	3	r		r		r							
PHYS 111 <i>General Physics</i>	4	r	r			r		r					
PHYS 112 <i>General Physics</i>	4	r	r			r		r		r			
ENGL 102 <i>Composition & Rhetoric</i>	3							r		r			
MATH 251 <i>Multivariable Calculus</i>	4	r								r			
MATH 261 <i>Elem. Diff. Equations</i>	4	r								r			
IENG 302 <i>Manufacturing Processes</i>	2	r		r	r								
IENG 303 <i>Manufact. Processes Lab</i>	1	r	r	r	r								
EE 221 <i>Intro. to Electrical Engr.</i>	3	r		r		r							
EE 222 <i>Intro. to Electrical Engr. Lab</i>	1	r	r	r									
GEC (21 hours)	21							r	r		r		
Technical Electives (6 hours)	6								r	r	r	r	

Outcome	ABET Assessment Team members To conduct Assessment of Year 2013	
a	Ismail Celik, Yu Gu, Mario Perhinschi and Pat Browning	Outcome a “Graduates will have an ability to apply knowledge of mathematics, science and engineering.”
b	Marvin Cheng, Alfred Lynam and Marcello Napolitano	Outcome b “Graduates will have an ability to design and conduct experiments, as well as to analyze data.”
c	Ken Means, Terry Musho and Greg Thompson	Outcome c “Graduates will have an ability to design a system, component or process to meet desired needs.”
d	Kostas Sierros, Jim Smith and Scott Wayne	Outcome d “Graduates will have an ability to function on multidisciplinary teams.”
e	Ever Barbero, John Kuhlman, Andrew Nix and Jason Gross	Outcome e “Graduates will have an ability to identify, formulate and solve engineering problems.”
f	Wade Huebsch and David Mebane	Outcome f “Graduates will have an understanding of professional and ethical responsibility.”
g	Salva Akkerman, Cosmin Dumitrescu and Nithi Sivaneri	Outcome g “Graduates will have an ability to communicate effectively.”
h	Victor Mucino and John Christian	Outcome h “Graduates will have the broad education necessary to understand the impact of engineering solutions in a global and societal context”.
i	Xingbo Liu, Ed Sabolsky and Samir Shoukry	Outcome i “Graduates will have a recognition of the need for, and an ability to engage in, life-long learning”.
j	Bruce Kang, Sam Mukdadi and Nick Wu	Outcome j “Graduates will have knowledge of contemporary issues.”
k	Larry Banta, Hailin Li and Xueyan Song	Outcome k “Graduates will have an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.”

MECHANICAL ENGINEERING					E	Outcome E-2013
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”					Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross	
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.					Rubrics for Performance Indicators:	
					Poor (1)	Fair (2)
					Good (3)	Very good (4)
					Excellent (5)	
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)					PI1 No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem
					PI2 No evidence of a formulation presented	Formulation poorly presented
					PI3 Solution offered without a method described	Solution method attempted, some description
					Formulation Mentioned but not developed	Formulation shown with equations
					Appropriate solution method used	Appropriate solution method used and described
					Formulation shown with equations and clear descriptions	Formulation shown with equations and clear descriptions
					Appropriate solution method used, with rationale described	Appropriate solution method used, with rationale described
Course/Term	PI1	PI2	PI3	Grade Ave.	Performance	Observations (Score explanation)
MAE 243						
MAE 320						
MAE 321						
MAE 342						
MAE 454						
MAE 456						
MAE 460						
Overall Performance 2013						
Average 2012						

Follow-up or Corrective Actions:	Responsible Person/Team/Cmte.
	To: AE CC
	To: Instructor (by Course)
	To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 243	Outcome E-2013				
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”				Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.				Rubrics for Performance Indicators:					
					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 243	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									
Overall Performance 2012									
Follow-up or Corrective Actions:						Responsible Person/Team/Cmte.			

	To: AE CC
	To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 320	Outcome E-2013				
Assessment Outcome E.				Assessment Team:					
“Graduates will have an ability to identify, formulate and solve engineering problems.”				Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators:				Rubrics for Performance Indicators:					
PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 320	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

MECHANICAL ENGINEERING			MAE 321		Outcome E-2013				
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”				Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.				Rubrics for Performance Indicators:					
					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 321	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 342		Outcome E-2013			
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”				Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.				Rubrics for Performance Indicators:					
					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 342	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 454	Outcome E-2013				
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”				Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.				Rubrics for Performance Indicators:					
					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 454	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 456	Outcome E-2013				
Assessment Outcome E. “Graduates will have an ability to identify, formulate and solve engineering problems.”				Assessment Team: Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators: PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.				Rubrics for Performance Indicators:					
					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 456	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

MECHANICAL ENGINEERING				MAE 460	Outcome E-2013				
Assessment Outcome E.				Assessment Team:					
“Graduates will have an ability to identify, formulate and solve engineering problems.”				Ever Barbero, John Kuhlman , Andrew Nix and Jason Gross					
Performance Indicators:				Rubrics for Performance Indicators:					
PI1. Capability to identify an engineering problem from a layman’s need PI2. Formulate and problem with engineering principles of mechanics PI3. Solve a problem using engineering methods, tools and instruments PI4. Grade average for the entire class.					Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
Performance: $P = (PI1 + PI2 + PI3 + GA) / 4$ P= Performance PI1 = Performance Indicator 1 PI2 = Performance Indicator 2 PI3 = Performance Indicator 3 GA= Average grade of class in assignment* (if GA is based on 100 pt scale, divide by 20; if GA is based on 4 pt scale, multiply by 1.25)				PI1	No clear effort in identifying nature of eng. problem	Slight ref. to the eng. nature or type of a problem	Clear indication of the eng. problem nature or type	Eng. Concepts used to define prob. leading to a formulation	Eng. Concepts used to define prob. and clearly explained.
				PI2	No evidence of a formulation presented	Formulation poorly presented	Formulation Mentioned but not developed	Formulation shown with equations	Formulation shown with equations and clear descriptions
				PI3	Solution offered without a method described	Solution method attempted, some description	Appropriate solution method used	Appropriate solution method used and described	Appropriate solution method used, with rationale described
Course MAE 460	PI1	PI2	PI3	Class Grade Ave.	Average	Observations (Score explanation)			
Key Asg. 1 (HW)									
Key Asg. 2 (HW)									
Key Asg. 3 (HW)									
Test 1 (Problem)									
Test 2 (Problem)									
Other (Project)									
Total Average									
Overall Performance 2013									

Overall Performance 2012		
Follow-up or Corrective Actions:		Responsible Person/Team/Cmte.
		To: AE CC
		To: Instructor (by Course)

Assessment Tool:

Alumni Survey

MAE Alumni Survey of Educational Success

Dear Alum, in an effort to improve the quality of our Educational Programs in Mechanical and Aerospace Engineering, we would like to request few minutes of your time to help us assess the level of attainment of our Educational Objectives and Learning Outcomes that our graduates exhibit in the development of their professional activity. This survey will serve as a tool for the assessment of our Program and is not intended to be used to evaluate you individually.

Please tell us your year of graduation and the degree that you earned.

This is a required question

In my work, I am able to apply knowledge of math, science and engineering effectively.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am able to design and conduct experiments, and analyze data.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am able to design a system, component or process to meet desired needs and constraints.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am able to function productively on multidisciplinary teams.

- Strongly Agree
- Agree
- Neutral

- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am able to identify, formulate and solve engineering problems.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I have a good understanding of professional and ethical responsibility.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am able to communicate effectively, both verbally and in writing.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I understand the impact of engineering solutions in a global and societal context.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I recognize the need for, and engage in, life-long learning.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am aware of and appreciate contemporary engineering issues.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am proficient in the use of techniques, skills and modern tools necessary for engineering practice.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

In my work, I am prepared to meet the varying demands of the workforce in the technological arena.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

Please add comments below to clarify or add to any of your answers above, or to provide general comments about the level of satisfaction you have with the way your education in the MAE department has prepared you for your career.

This is a required question

In general, How would you rate yourself in the following categories

	Poor	Fair	Good	Very Good	Excellent
Your proficiency in your field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your drive to learn on your own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your preparedness to meet the demands of the job-market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please enter one response per row

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Assessment Tool:

Employer Survey

Employer Survey of MAE Graduates

Dear Employer, in an effort to improve the quality of our Educational Programs in Mechanical and Aerospace Engineering, we would like to request few minutes of your time to help us assess the level of attainment of our Educational Objectives and Learning Outcomes that our graduates exhibit in the development of their professional activity in your company. This survey will serve as a tool for the assessment of our Program and is not intended to be used to evaluate the graduate's work for you or in your company.

Please tell us how many WVU MAE graduates you employ, and for how long.

This is a required question

WVU MAE graduates in my employ are able to apply knowledge of math, science and engineering effectively.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are able to design and conduct experiments, and analyze data.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are able to design a system, component or process to meet desired needs and constraints.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are able to function productively on multidisciplinary teams.

- Strongly Agree
- Agree

- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are able to identify, formulate and solve engineering problems.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ have a good understanding of professional and ethical responsibility.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are able to communicate effectively, both verbally and in writing.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ understand the impact of engineering solutions in a global and societal context.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ recognize the need for, and engage in, life-long learning.

- Strongly Agree
- Agree
- Neutral

- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are aware of and appreciate contemporary engineering issues.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are proficient in the use of techniques, skills and modern tools necessary for engineering practice.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

WVU MAE graduates in my employ are prepared to meet the varying demands of the workforce in the technological arena.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Not Applicable

This is a required question

Please add comments below to clarify or add to any of your answers above, or to provide general comments about the level of satisfaction you have with graduates of the MAE department at WVU.

This is a required question

In general, How would you rate WVU MAE graduates in the following categories

	Poor	Fair	Good	Very Good	Excellent
Proficiency in his/her field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive to learn on his/her own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparedness to meet the demands of the job market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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