ABET Preparation Handout #4
Faculty Guide for using the
"Student Outcomes Assessment Spreadsheet"

This guide explains how to use the "Student Outcomes Assessment Spreadsheet" (enclosed on page 4 of this handout) as the grading spreadsheet for each ABET course. The data from the grading spreadsheet from each course is used by the Department to determine the program's overall effectiveness achieving Student Outcomes.

The spreadsheet details the relationship between assignments associated with Student Outcomes and determines the level of achievement of Student Outcomes for a single course in a program.

Excerpts of the example spreadsheet are included in the narrative.

1. Use your normal grading system for the class with the Student Outcomes Assessment Spreadsheet.

To use this spreadsheet, fill out the parts in green - everything else should take care of itself.

The grade sheet uses faculty assigned weighting factors for each test and homework assignment in the. The maximum possible points is the weighting factor * 100.

ABET Student (Yes/No)	Student Name	HW1 Descriptive Title of HW [100]	HW2 Descriptive Title of HW [100]	HW3 Descriptive Title of HW [100]	HW4 Descriptive Title of HW [100]	HW5 Descriptive Title of HW [100]	HW6 Descriptive Title of HW [100]	HW7 Descriptive Title of HW [100]	HW8 Descriptive Title of HW [150]	HW9 Descriptive Title of HW [100]	HW10 Descriptive Title of HW [100]	HW11 Descriptive Title of HW [100]	FINAL EXAM [300]	Assigned Grade	Overall Percent
		92	93	98	93	90	90	89	130	92	88	87	275	A-	91%
		92	86	88	90	40	80	0	0	94	0	70	240	C-	61%
		100	94	100	98	90	98	81	130	95	90	95	280	A	93%
		92	88	94	93	97	95	93	130	94	90	95	285	A	93%
		90	95	97	94	90	95	93	135	95	92	94	282	A	93%
		100	95	90	86	0	93	94	120	90	0	92	275	B-	78%
		92	86	85	88	95	88	90	135	92	93	85	261	A-	89%
		83	80	86	93	91	88	90	130	93	95	87	265	HP	88%
		95	90	100	98	0	88	90	137	95	100	96	295	HP	89%
		100	96	90	91	90	92	78	135	93	90	90	270	A-	91%
		80	94	98	97	0	94	98	145	93	100	95	282	HP	88%
		100	95	100	98	91	97	94	135	93	100	100	288	H	96%
	weighting factor	1	1	1	1	1	1.0	1	1.5	1.0	1.0	1.00	3.0		

2. Assign a fractional component of the outcomes associated with this particular course to each relevant graded exercise. Every column should add up to one.

ABET Outcome	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	FINAL EXAM	Percent of Course	
1					0.5		0.5				0.5		10.3%	This last column shows
2													0.0%	how much of outcomes 1-7
3		0.5				0.5		0.5	0.5			0.1	17.6%	go into the course grade.
4	1	0.5	1	0.5	0.5					0.5			27.6%	This will be useful information
5				0.5			0.5					0.4	15.2%	for evaluating our program.
6								0.5		0.5	0.5	0.4	20.3%	
7						0.5			0.5			0.1	9.0%	
(should sum to 1)	1	1	1	1	1	1	1	1	1	1	1	1	100%	

3. These fractional components determine the percentage of the course devoted to each outcome.

Ex:

% outcome a in a specific course =

$$\frac{(50\% \ HW5)(1 \ wt.factor \ HW5) + (50\% \ HW7)(1 \ wt.factor \ HW7) + (50\% \ HW11)(1 \ wt.factor \ HW11)}{Total \ of \ wt.factors}$$

$$= \frac{(0.5)(1) + (0.5)(1) + (0.5)(1)}{14.5} = 10.3 \ \%$$

4. Establish numerical threshold for Unsatisfactory/ Acceptable/ Exemplary performance in this course.

Please enter performance cutoff percentages below. These are the numbers that determine the cutoff between Unsatisfactory, Acceptable, and Exemplary.

Cutoff Percentages

80	Unsatisfactory
95	Exemplary

Breakdown of Student Performance by Assignment

*Each column should add up to the number of students in the course.

	Descriptive Title of HW [100]	Descriptive Title of HW [100]	Descriptive Title of HW [100]	Descriptive Title of HW [100]	Descriptive Title of HW [100]	Descriptiv e Title of HW [100]	Descriptive Title of HW [100]	Descriptive Title of HW [150]	Descriptive Title of HW [100]	Descriptive Title of HW [100]	Descriptiv e Title of HW [100]	FINAL EXAM [300]
Unsatisfactory	0	0	0	0	4	0	2	1	0	2	1	0
Acceptable	7	8	6	8	6	8	9	10	9	6	6	9
Exemplary	5	4	6	4	2	4	1	1	3	4	5	3

5. The number of students in each performance category is calculated by the spreadsheet for each graded assignment/exam.

6. A summary of the class performance in each relevant outcome is calculated by the spreadsheet based on scores in the relevant assignments as:
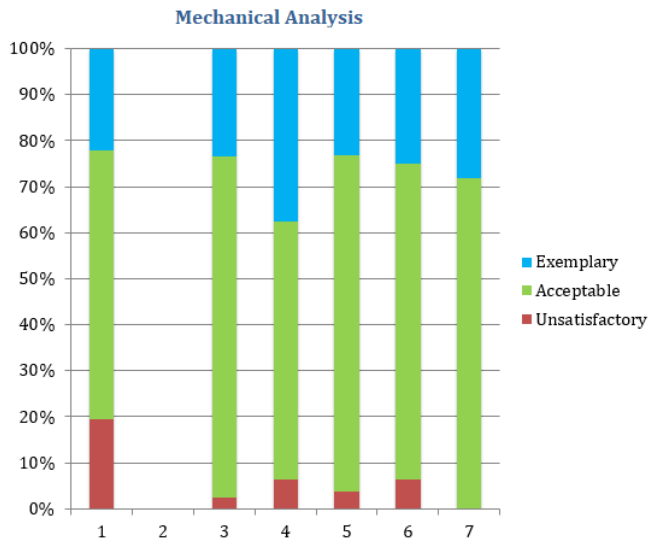
Level of Performance =

$$\frac{\sum(\#unsat \ students \ in \ ea. \ relevant \ assig)(fract. \ component \ of \ this \ assig. \ of \ this \ outcome)(wt \ factor \ of \ the \ relevant \ assig)}{(total \ \# \ students)(\% \ of \ outcome \ in \ the \ course)(total \ weighing \ factor)}$$

$$= \frac{(4)(0.5)(1) + (2)(0.5)(1) + (1)(0.5)(1)}{(12)(0.103)(14.5)} = 19\%$$

7. The spreadsheet quantifies the levels of performance for each outcome in the course:

Results: Course Summary for: MENG-123

*If the chart does not appear, please select the tabular data on the right of the chart and insert your own column chart.

Mechanical Analysis

Outcome	Unsatisfactory	Acceptable	Exemplary	Total
1	19%	58%	22%	100%
2	0%	0%	0%	0%
3	2%	74%	23%	100%
4	6%	56%	38%	100%
5	4%	73%	23%	100%
6	6%	69%	25%	100%
7	0%	72%	28%	100%

■ Exemplary
■ Acceptable
■ Unsatisfactory

Note that 1-7 items not evaluated (i.e., no entries in the matrix) do not have a column in the graph.

3

Sample Spreadsheet for MENG 285 (Introduction to Material Science)

YALE SCHOOL OF ENGINEERING AND APPLIED SCIENCE

MECHANICAL ENGINEERING ABET OUTCOME REVIEW

This spread sheet template tracks achievement of the ABET Student Outcomes.
To use this spreadsheet, fill out the parts in green - everything else should take care of itself.

ABET Student Outcomes:

1. An ability to identify, formulate, & solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members provide leadership, create collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Number:	MENG-123
Course Name:	Mechanical Analysis

To use this spreadsheet, fill out the parts in green - everything else should take care of itself.

The grade sheet uses faculty assigned weighting factors for each test and homework assignment. The maximum possible points is the weighting factor * 100.

ABET Student (Yes/No)	Student Name	HW1 Descriptive Title of HW [100]	HW2 Descriptive Title of HW [100]	HW3 Descriptive Title of HW [100]	HW4 Descriptive Title of HW [100]	HW5 Descriptive Title of HW [100]	HW6 Descriptive Title of HW [100]	HW7 Descriptive Title of HW [100]	HW8 Descriptive Title of HW [150]	HW9 Descriptive Title of HW [100]	HW10 Descriptive Title of HW [100]	HW11 Descriptive Title of HW [100]	FINAL EXAM FINAL EXAM [300]	Assigned Grade	Overall Percent
		92	93	98	93	90	90	89	130	92	88	87	275		91%
		92	86	88	90	40	80	0	0	94	0	70	240		61%
		100	94	100	98	90	98	81	130	95	90	95	280		93%
		92	88	94	93	97	95	93	130	94	90	95	285		93%
		90	95	97	94	90	95	93	134	95	92	94	282		93%
		100	95	90	86	0	93	94	120	90	0	92	275		78%
		92	86	85	88	95	88	90	135	92	93	85	261		89%
		83	80	86	93	91	88	90	130	93	95	87	265		88%
		95	90	100	98	0	88	90	137	95	100	96	295		89%
		100	96	90	91	90	92	78	135	93	90	90	270		91%
		80	94	98	97	0	94	98	145	93	100	95	282		88%
		100	95	100	98	91	97	94	135	93	100	100	288		96%
	weighting factor	1	1	1	1	1	1.0	1	1.5	1.0	1.0	1.00	3.0		

Please assign a fraction of each of the ABET student outcomes (see 1-7 above) to each test and homework assignment. The percent of course devoted to each ABET outcome is calculated, accounting for the maximum possible points and the weighting factor.

ABET Outcome	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	FINAL EXAM	Percent of Course
1					0.5		0.5				0.5		10.3%
2													0.0%
3			0.5			0.5		0.5	0.5			0.1	17.6%
4	1	0.5	1	0.5	0.5					0.5			27.6%
5				0.5			0.5					0.4	15.2%
6								0.5		0.5	0.5	0.4	20.3%
7						0.5			0.5			0.1	9.0%
(should sum to 1)	1	1	1	1	1	1	1	1	1	1	1	1	100%

This last column shows how much of outcomes 1-7 go into the course grade. This will be useful information for evaluating our program.

Please enter performance cutoff percentages below. These are the numbers that determine the cutoff between Unsatisfactory, Acceptable, and Exemplary.

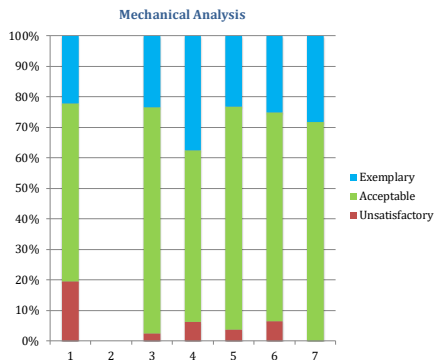| Cutoff Percentages	
80	Unsatisfactory
95	Exemplary

Breakdown of Student Performance by Assignment

*Each column should add up to the number of students in the course.

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Unsatisfactory	0	0	0	0	4	0	2	1	0	2	1	0
Acceptable	7	8	6	8	6	8	9	10	9	6	6	9
Exemplary	5	4	6	4	2	4	1	1	3	4	5	3

Results: Course Summary for: MENG-123

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Mechanical Analysis

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5	4%	73%	23%	100%
6	6%	69%	25%	100%
7	0%	72%	28%	100%

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