

Report to External Review Board

*Brigham Young University
Civil & Environmental Engineering
October 9, 2003*

ABET Visit – October 2002

- We passed!
- Thanks again for all of your help
- Next review → 2008

ABET Review - Strengths

- High quality, practice-oriented degree
- Highly motivated and satisfied students
- Enthusiastic, qualified faculty
- Outcomes-based assessment strategy
“outstanding”

ABET Review - Weaknesses

- No deficiencies
- No weaknesses
- No concerns
- Four minor observations
 - ABC report discrepancy
 - Suggested adopting a survey of employers
 - Put student rep. on undergraduate committee
 - Students want to see more construction topics

What Now?

- Process is now established
- Continue with current system
- Suggestions welcome

Assessment Tools

- Exam-competency tracking
 - Move to more automated system?
- FE Exam
- Exit Interviews
- Student Evaluations
- External Review Board
- Alumni Survey

FE Exams

National Council of Examiners for Engineering and Surveying (NCEES)
 Fundamentals of Engineering Examination
 OCTOBER 2002 Administration
 Report 5 - Subject Matter Report by Major Based on Particular FE Examination Selected

ABET-Accredited Engineering Program Examinees
 Currently Enrolled in School

Board: UTMB
 Board Code: 40
 Major: CIVIL

	This Institution			State			Nat'l			Comparator Groupings		
	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score
No. Examinees Taking	34	67	1588	1049	247	179						
No. Examinees Passing	32	60	1369	982	202	131						
% Examinees Passing	94%	90%	81%	84%	81%	74%						

Number of Exam Questions Correct	This Institution			State			Nat'l			Comparator Groupings		
	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct
AM Subject (1 point each)	11	63	61	2.1	63	62	50					
CHEMISTRY	7	73	53	1.4	55	49	53					
COMPUTERS	3	69	64	1.8	66	59	59					
ELECTRICAL CIRCUITS	12	31	41	2.1	41	45	39					
ENGINEERING DRAWING	5	73	72	1.1	72	71	70					
ETHICS	5	69	66	1.0	66	65	67					
FLUID MECHANICS	5	61	56	1.6	58	58	51					
MAT SCI/MTS MATTER	8	69	61	1.5	62	62	56					
MATHEMATICS	24	70	59	2.8	61	59	57					
MECH OF MATERIALS	8	68	63	1.5	65	64	62					
STATICS	12	70	61	2.2	63	64	58					
THERMODYNAMICS	11	58	45	2.1	46	48	40					

Number of Exam Questions Correct	This Institution			State			Nat'l			Comparator Groupings		
	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct
PM Subject (2 points each)	11	40	43	0.9	43	43	41					
CONSTRUCTION MGMT	6	44	53	1.2	55	54	51					
CONV & NEW METHODS	5	54	52	1.1	52	54	51					
ENVIRONMENTAL ENGR	6	75	59	1.4	59	63	54					
HYDRAUL/HYDROLOG SYS	6	88	76	1.8	76	74	74					
LEGAL & PROF ASPECTS	6	65	64	1.0	64	66	62					
STRUCTURAL ANALYSIS	6	79	68	1.3	67	62	66					
STRUCTURAL DESIGN	6	64	58	1.4	58	58	53					
SOIL MECH & FOUNDAT	6	51	46	1.2	45	47	41					
SURVEYING	6	54	50	1.3	50	52	49					
TRANS FACILITIES	6	58	51	1.5	50	53	49					
WATER SUP & TREAT	6	58	51	1.5	50	53	49					

October 2002

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 APRIL 2003 Administration
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	This Institution			State			Nat'l			Comparator Groupings		
	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score	No. Examinees Taking	% Examinees Passing	Average Score
No. Examinees Taking	21	52	2530	1438	415	324						
No. Examinees Passing	20	44	1860	1170	221	222						
% Examinees Passing	95%	85%	78%	81%	80%	69%						

Number of Exam Questions Correct	This Institution			State			Nat'l			Comparator Groupings		
	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct
AM Subject (1 point each)	11	75	71	1.8	72	71	69					
CHEMISTRY	7	55	53	1.6	55	52	51					
COMPUTERS	3	65	59	1.8	62	58	54					
ELECTRICAL CIRCUITS	12	20	28	2.5	28	28	26					
ENGINEERING DRAWING	5	78	78	1.3	78	78	77					
ETHICS	5	67	61	0.7	61	61	48					
FLUID MECHANICS	5	56	49	1.3	50	49	46					
MAT SCI/MTS MATTER	8	56	49	1.3	50	49	46					
MATHEMATICS	24	68	59	4.1	60	59	55					
MECH OF MATERIALS	8	55	54	1.7	56	53	51					
STATICS	12	61	55	2.3	56	54	52					
THERMODYNAMICS	11	54	42	1.8	42	46	40					

Number of Exam Questions Correct	This Institution			State			Nat'l			Comparator Groupings		
	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct	Average Percent Correct	Average Percent Deviation	Extensive Correct
PM Subject (2 points each)	3	49	44	0.8	45	44	43					
CONSTRUCTION MGMT	6	56	43	1.4	45	43	40					
CONV & NEW METHODS	5	75	67	1.3	69	67	62					
ENVIRONMENTAL ENGR	6	64	59	1.3	60	62	56					
HYDRAUL/HYDROLOG SYS	6	84	70	0.8	71	71	66					
LEGAL & PROF ASPECTS	6	41	47	1.2	48	47	48					
STRUCTURAL ANALYSIS	6	62	62	1.2	64	64	60					
STRUCTURAL DESIGN	6	58	47	1.5	49	46	44					
SOIL MECH & FOUNDAT	6	57	43	1.5	44	42	39					
SURVEYING	6	56	52	1.5	52	55	49					
TRANS FACILITIES	6	56	52	1.5	52	55	49					
WATER SUP & TREAT	6	56	52	1.5	52	55	49					

April 2003

FE Exam, cont.

FE Exam Results - Percent Passing

CE En Dept. - Brigham Young University

		# Taking	# Passing	% Passing
Oct. 1999	BYU	40	40	100%
	Nat'l	2410	1645	68%
Apr. 2000	BYU	23	21	91%
	Nat'l	3224	2104	65%
Oct. 2000	BYU	28	27	96%
	Nat'l	1587	1286	81%
Apr. 2001	BYU	29	28	97%
	Nat'l	2337	1801	77%
Oct. 2001	BYU	53	49	92%
	Nat'l	2789	1910	68%
Apr. 2002	BYU	27	25	93%
	Nat'l	2541	2019	79%
Oct. 2002	BYU	34	32	94%
	Nat'l	1688	1369	81%
Apr. 2003	BYU	21	20	95
	Nat'l	2530	1980	78

FE Exam, cont.

FE Exam Results - BYU vs. National Average

Category	Outcome	BYU	Nat'l	Diff
Chemistry	1	66	58	9
Computers	9	77	61	16
Dynamics	2	58	54	5
Elect. Circuits		37	40	-4
Eng. Economics	7	73	62	11
Ethics	12	81	76	5
Fluid Mechanics	2	66	56	10
Materials	2	62	53	9
Mathematics	1	66	55	12
Mechanics	2	64	55	9
Statics	2	66	57	9
Thermodynamics		55	44	11
Const. Mgmt.		50	47	3
Comp/Num Mthds	9	73	55	19
Environmental Eng.	6	62	54	8
Hydric/Hydrolog	6	61	50	11
Legal/Prof Aspects	10	67	64	4
Structural Analysis	4	56	49	7
Structural Design	4.7	46	43	2
Soil Mech & Found	3	56	48	8
Surveying	9	61	47	14
Transportation	5	62	50	12
Water Treatment	6	59	51	8

Outcome	BYU	Nat'l	Diff
1. Basic math & science	66.1	56.1	10.0
2. Engineering fundamentals	63.1	55.0	8.1
3. Geotechnical engineering	55.7	47.7	8.0
4. Structural engineering	50.9	46.1	4.8
5. Transportation engineering	62.0	50.2	11.8
6. Water resource/env. Eng.	60.5	51.6	8.9
7. Design	59.1	52.3	6.8
8. Communications	n/a	n/a	n/a
9. Modern engineering tools	70.2	54.2	16.1
10. Professional practice	67.3	63.7	3.7
11. Cult., soc., env. Awareness	n/a	n/a	n/a
12. Integrity, faith	81.0	75.7	5.3

Exit Interviews

December 2002 Exit Interview Results

9. On a scale of 1 (poor) to 10 (outstanding), rate how well the Civil & Environmental Engineering program has enhanced your understanding and/or abilities in the following areas. Also, on a scale of 1 (not important) to 10 (extremely important), rate how important you feel these attributes should be to our department. Provide comments as appropriate.

Attribute	Ratings		Measures	
	Dev.	Imp.	Dev/Imp	Dev+Imp
1. Basic math & science	8.2	8.7	0.93	16.9
2. Engineering fundamentals	8.7	9.3	0.93	18.0
3. Geotechnical engineering	8.3	8.4	0.98	16.7
4. Structural engineering	8.4	8.6	0.97	16.9
5. Transportation engineering	7.0	8.2	0.85	15.1
6. Water resource/env. eng.	8.7	9.0	0.97	17.7
7. Design	8.1	9.1	0.89	17.3
8. Communications	8.3	9.4	0.88	17.7
9. Modern engineering tools	9.3	9.5	0.98	18.8
10. Professional practice	8.6	9.4	0.92	18.0
11. Cult., soc., env. awareness	8.9	9.4	0.95	18.3
12. Integrity, faith	9.6	9.9	1.0	19.5

Exit Interviews, cont.

April 2003 Exit Interview Results

9. On a scale of 1 (poor) to 10 (outstanding), rate how well the Civil & Environmental Engineering program has enhanced your understanding and/or abilities in the following areas. Also, on a scale of 1 (not important) to 10 (extremely important), rate how important you feel these attributes should be to our department. Provide comments as appropriate.

Attribute	Ratings		Measures	
	Dev.	Imp.	Dev/Imp	Dev+Imp
1. Basic math & science	8.3	8.8	0.95	17.1
2. Engineering fundamentals	9.1	9.6	0.95	18.7
3. Geotechnical engineering	8.3	8.4	1.00	16.7
4. Structural engineering	8.8	8.6	1.03	17.4
5. Transportation engineering	7.4	8.2	0.90	15.7
6. Water resource/env. eng.	8.7	8.7	1.00	17.3
7. Design	8.4	9.3	0.90	17.7
8. Communications	8.7	9.5	0.91	18.2
9. Modern engineering tools	9.2	9.7	0.95	18.9
10. Professional practice	9.2	9.6	0.96	18.9
11. Cult., soc., env. awareness	8.1	8.7	0.93	16.9
12. Integrity, faith	9.6	9.9	1.0	19.5

Exit Interviews, cont.

August 2003 Exit Interview Results

9. On a scale of 1 (poor) to 10 (outstanding), rate how well the Civil & Environmental Engineering program has enhanced your understanding and/or abilities in the following areas. Also, on a scale of 1 (not important) to 10 (extremely important), rate how important you feel these attributes should be to our department. Provide comments as appropriate.

Attribute	Ratings		Measures	
	Dev.	Imp.	Dev/Imp	Dev+Imp
1. Basic math & science	8.5	8.8	0.96	17.3
2. Engineering fundamentals	8.0	9.0	0.89	17.0
3. Geotechnical engineering	8.0	7.5	1.07	15.5
4. Structural engineering	8.3	8.8	0.94	17.2
5. Transportation engineering	6.3	6.8	0.93	13.2
6. Water resource/env. eng.	8.5	7.3	1.16	15.8
7. Design	7.5	9.7	0.78	17.2
8. Communications	6.7	9.0	0.74	15.7
9. Modern engineering tools	6.7	9.0	0.74	15.7
10. Professional practice	7.8	8.8	0.89	16.7
11. Cult., soc., env. awareness	6.8	8.0	0.85	14.8
12. Integrity, faith	8.7	8.8	1.0	17.5

Exit Interviews, cont.

Exit Interview Result History

CE En Dept. - Brigham Young University

Attribute	Dec. '00	April '01	Aug. '01	Dec. '01	April '02	Aug. '02	Dec. '02	April '03	Aug. '03	Average	Scaled
1. Basic math & science	8.7	8.1	8.7	8.5	7.9	8.0	8.2	8.3	8.5	8.3	83.0
2. Engineering fundamentals	8.7	8.5	8.4	8.9	8.2	8.7	8.7	9.1	8.0	8.6	85.7
3. Geotechnical engineering	8.3	7.6	8.7	8.7	8.1	8.5	8.3	8.3	8.0	8.3	83.0
4. Structural engineering	8.8	8.1	8.6	8.9	8.5	8.6	8.4	8.8	8.3	8.6	85.8
5. Transportation engineering	6.3	6.8	7.0	7.7	7.3	7.9	7.0	7.4	6.3	7.1	71.5
6. Water resource/env. Engr.	8.5	8.4	9.1	8.9	8.3	8.6	8.7	8.7	8.5	8.6	86.2
7. Design	7.6	8.0	8.6	8.5	7.6	8.3	8.1	8.4	7.5	8.1	80.9
8. Communications	7.5	7.8	7.8	8.1	8.1	8.1	8.3	8.7	6.7	7.9	78.9
9. Modern engineering tools	7.5	8.7	8.9	8.6	8.5	9.1	9.3	9.2	6.7	8.6	85.5
10. Professional practice	8.7	8.5	9.0	9.3	8.6	8.9	8.6	9.2	7.8	8.8	88.3
11. Cult., soc., env. Awareness	8.3	8.0	8.4	7.9	8.0	8.3	8.9	8.1	6.8	8.2	81.7
12. Integrity, faith	9.6	9.3	9.6	9.7	9.1	9.5	9.6	9.6	8.7	9.5	94.6