WSU Five-Year Program Review
Self-Study

Cover Page

Department/Program: Engineering Technology-Design Engineering Technology

Semester Submitted: Fall 2014

Self-Study Team Chair: Glen West

Self-Study Team Members: Jeremy Farner
Meg Leatherbury

Contact Information: Rick Orr, Department Chair
Phone: 626-7514
Email: rworr@weber.edu

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A. Brief Introductory Statement

This five year program review self-study is for the Design Engineering Technology program which is in the Department of Engineering Technology in the College of Applied Science and Technology. The study is based upon the self-study done for ABET as the program will be undergoing reaccreditation review by ABET in 2015. It should be noted that the program provides courses for its own majors as well as service courses for the manufacturing and mechanical engineering technology programs.

It should be noted that the program faculty are teaching very heavy loads because of the inability to hire more full-time faculty, the growth in enrollment, and the lack of qualified adjunct faculty available to teach during the day. These loads are such that they prevent the faculty from doing the other aspects of their employment, namely scholarship and service.

B. Mission Statement

The mission of the Design Engineering Technology program is to provide its students with an education that emphasizes a solid theoretical background supplemented by practical experiences. This education enables students to acquire career-specific competencies and leadership skills, prepare them for advanced education in their chosen fields of study, and develop in them a respect for lifelong learning. Emphasis is given to the importance of students becoming and remaining competent in their chosen career, the need for continual improvement and application of new technologies, and the need to become active contributing members of society with an understanding of professional and ethical responsibilities. The program also works to advance knowledge in the discipline through scholarly activities including instructional improvement, applied research and transfer of technology. The program also strives to serve the students of the College of Applied Science and Technology and the University in addition to the business and industrial communities of Utah and the intermountain region.

C. Curriculum

Curriculum Map

I = Introduced **R = Reinforced** **E = Emphasized** Core Courses in the Program	Department/Program Learning Outcomes										
	Learning Outcome 1	Learning Outcome 2	Learning Outcome 3	Learning Outcome 4	Learning Outcome 5	Learning Outcome 6	Learning Outcome 7	Learning Outcome 8	Learning Outcome 9	Learning Outcome 10	Learning Outcome 11
DET 1010 Intro to Engr & Technical Design	I										
DET 1040 Intro to Residential Architecture	I										
DET 1160 GD&T using 3D CAD		I		I							
DET 1350 Residential Architecture Design	R			I							
DET 2000 Intro to Comm Architecture & BIM	I										
DET 2460 Product Design Fund 3D CAD	R			R		R					
DET 2650 Product Design & Development	R			R		R					
DET 2660 Arch Structural Design & Detailing	R			R							
DET 3000 Green Building Methods & Cert.		I		R							
DET 3100 Tool Design		R				R					
DET 3300 Applied Kinematics Analysis	I										
DET 3400 Rendering Basics	I		R								
DET 3470 Intro to Catia V5	I		R								
DET 4350 Virtual Design & Construction Apps	R		R								
DET 4400 Animation Basics	I										
DET 4470 Advanced Catia V5	E					R					
DET 4500 Hydraulic & Pneumatic Apps	I										
DET 4600 Senior Project I					R	E	R	E	R		E

I = Introduced **R = Reinforced** **E = Emphasized** Core Courses in the Program	Department/Program Learning Outcomes										
	Learning Outcome 1	Learning Outcome 2	Learning Outcome 3	Learning Outcome 4	Learning Outcome 5	Learning Outcome 6	Learning Outcome 7	Learning Outcome 8	Learning Outcome 9	Learning Outcome 10	Learning Outcome 11
DET 4610 Senior Project II					R	E	R	E	R		E
MFET 1210 Machining Principles & Practices			I								
MFET 2300 Statics & Strength of Materials											
MFET 2360 Manf Processes & Materials	I	I									
MFET 2410 Qual Concepts & Statistical Appl	I										
MFET 3400 Machine Design	I	I		R							
MFET 3550 Manufacturing Supervision	I							E			E
MFET 4610 Senior Project Planning & Estimating	R							E			E
Technical Electives									R	R	

Summary Information (as needed)

D. Student Learning Outcomes and Assessment

Measureable Learning Outcomes

At the end of their study at WSU, students in this program will

1. Demonstrate appropriate mastery of knowledge, skills and modern tools in the discipline, including technologies of materials, manufacturing processes, tooling, automation, production operations, maintenance, quality, industrial organization and management, and statistics.

2. Apply current knowledge of technologies of materials, manufacturing processes, tooling, automation, production operations, maintenance, quality, industrial organization and management, and statistics to design engineering technology problems.

3. Conduct, analyze and interpret experiments and apply experimental results to improve processes.

4. Apply creativity to design of systems, components and processes.

5. Function effectively on teams.

6. Demonstrate creativity in designing solutions to problems through analysis and experimentation leading to modification of systems, components and processes

7. Communicate effectively in written, oral, and graphical forms.

8. Recognize the need for and possess the ability to pursue lifelong learning.

9. Understand professional, ethical and social responsibilities.

10. Respect diversity and recognize professional, societal and global issues.

11. Have a commitment to quality, timeliness and continuous improvement.

Summary Information (as needed)

Evidence of Learning: Courses within the Major

Evidence of Learning: Courses within the Major					
Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
1. Demonstrate appropriate mastery of knowledge, skills and modern tools in the discipline,	1. Course Exams				
	2. Surveys (Exit Interview w/student)	No survey question responses below 3 on a 1-5 scale	Survey is administered in MFET 4610 senior Project; Last semester assessment 4.0/5	Students feel they are adequately prepared	Continue surveys
	3. Senior Project Evaluations	No evaluations below 3 on a scale of 1-5	Senior Project evaluations for last semester showed an average score of over 4. All were above 3.		
	4. Select student work				
2. Apply current knowledge of technologies to design engineering technology problems	1. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 4.3/5	Students feel they are adequately prepared	Continue surveys

Evidence of Learning: Courses within the Major

Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
2. continued	2. Course Exams				
	3. Senior Project Evaluations				
	4. Select student work				
3. Conduct, analyze and interpret experiments and apply experimental results to improve processes.	1. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 4.0/5	Students feel they are adequately prepared	Continue surveys
	2. Senior Project Evaluations				

Evidence of Learning: Courses within the Major

Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
3. continued	3. Select student work				
4. Apply creativity to design of systems, components and processes.	1. Senior Project Evaluations				
	2. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5	Students feel they are adequately prepared	Continue surveys
	3. Select student work				
5. Function effectively on teams.	1. Senior Project Evaluations				

Evidence of Learning: Courses within the Major

Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
5. continued	2. Surveys (student)				
	3. Select student work				
6. Demonstrate the ability to identify, analyze and solve broadly defined engineering technology problems	1. Senior Project Evaluations				
	2. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5	Students feel they are adequately prepared	Continue surveys
	3. Select student work				
7. Communicate effectively in written, oral, and graphical forms.	1. Senior Project Evaluations				

Evidence of Learning: Courses within the Major

Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
7. continued	2. Select student work				
	3. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 4.9/5	Students feel they are adequately prepared	Continue surveys
8. Recognize the need for and possess the ability to pursue lifelong learning.	1. Senior Project Evaluations				
	2. Surveys (student)				
9. Understand professional, ethical and social responsibilities.	1. Senior Project Evaluations				
	2. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5	Students feel they are adequately prepared	Continue surveys

Evidence of Learning: Courses within the Major					
Measureable Learning Outcome	Method of Measurement	Threshold for Evidence of Learning	Findings Linked to Outcomes	Interpretation of Findings	Action Plan/Use of Results
10. Respect diversity and recognize professional, societal and global issues.	1. Senior Project Evaluations				
	2. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 4.9/5	Students feel they are adequately prepared	Continue surveys
	3. Select student work				
11. Have a commitment to quality, timeliness and continuous improvement.	1. Senior Project Evaluations				
	2. Surveys (student)		Survey is administered in MFET 4610 senior Project; Last semester assessment 4.8/5	Students feel they are adequately prepared	Continue surveys

E. Academic Advising

Advising Strategy and Process

All Design Engineering Technology students are required to meet with a faculty advisor at least annually for course and program advisement. Students may call 801-626-6305 for more information or to schedule an appointment. Advisement may also be obtained in Engineering Technology, room 214.

Effectiveness of Advising

The current advisement process appears to be effective as there are very few issues concerning wrong advising. Advising as done in the program covers both career guidance and what courses students need to be taking.

Past Changes and Future Recommendations

There currently are no plans to change the current advising process.

F. Faculty

Faculty Demographic and Diversity Information

The Design Engineering Technology program currently has three full-time faculty members and approximately 3 adjunct faculty who teach part-time. The number of adjuncts varies by semester and is included in the subcategory on adjuncts.

Main Categories		
	Subcategories	Number
Gender		2
		1
Ethnicity		2
	Male	2
Degree	Female	
	Euro-American	3
	Bachelors	
Rank/Tenure	Tenured	3
	Tenure Track	
	Instructor	
	Adjunct	
Year Teaching	<5	1
	5-20	2
	>20	

Programmatic/Departmental Teaching Standards

All faculty in the College are expected to be good teachers. Where there is a perceived weakness in a faculty member's teaching, they are counseled by a mentor, encouraged to attend the on-campus presentations on teaching, and in some cases have been sent to national conferences specific to teaching.

Faculty Qualifications

To be tenured or be hired on tenure track, faculty must meet one of the two following requirements:

1. Attainment of the earned doctorate in a field applicable to Design Engineering Technology and three years of full-time industrial experience.
2. Attainment of a master's degree in a field applicable to Design Engineering Technology and five years of full-time industrial experience.

Adjunct faculty must have a degree in Design Engineering Technology or its equivalent or in a related field and be currently active in the content area in which they are teaching.

Evidence of Effective Instruction

i. Regular Faculty
   Tenure track faculty are evaluated each semester for every class they teach. Tenured faculty are evaluated in at least one class each semester they teach. Any concerns are discussed with the department chair.

ii. Adjunct Faculty
   Adjunct faculty are evaluated each semester for every class they teach. Any concerns are discussed with the department chair.

Mentoring Activities

Faculty are mentored by the program coordinator and by the program chair. Faculty mentors also work with adjunct faculty to improve teaching and to assist with classroom issues such as testing, syllabi, online, cheating, and classroom discipline.

Ongoing Review and Professional Development

Tenure track faculty are reviewed informally once a year by the department chair and formally during their third and sixth years. Tenured faculty are reviewed every three years by the department chair.

Faculty members are provided opportunities for professional development in areas of instruction, scholarship, and service. This includes taking professional courses, attending and/or presenting at professional conferences, and participating in research and scholarly

discussion groups on campus. In addition, all faculty are encouraged to submit proposals to the Research Scholarship and Professional Growth Committee and the Academic Resources and Computing Committee.

G. Support Staff, Administration, Facilities, Equipment, and Library

Adequacy of Staff

The department has one and a half technicians, one secretary, and several student aides that are shared among all of the programs. This number of staff is adequate to meet the needs of the program.

i. Ongoing Staff Development

Staff are encouraged to seek professional development where appropriate and have attended conferences off-campus and out-of-state paid for by the College.

Adequacy of Administrative Support

While the operating budgets are adequate to support the program, there is no capital equipment budget in the College. Therefore acquisition of new equipment is dependent upon other sources of funding which can be problematic. However, there is a definite lack of support for hiring new faculty which causes the faculty in the program to teach overloads thus reducing their time to participate in scholarly activities or service.

Adequacy of Facilities and Equipment

The primary tool used by the program is the personal computer. Currently the College is able to replace its computers every three years which is sufficient to keep them current with the available software. Some of the equipment used in the support courses is getting old and in need of replacement. Because of the budget situation discussed in the previous paragraph, the issue of when this equipment will be replaced is somewhat up in the air.

Adequacy of Library Resources

The library resources are adequate to support the program.

H. Relationships with External Communities

Description of Role in External Communities

The program has a strong and ongoing relationship with the external community, particularly with the companies that employ its graduates. A partial list of companies the program interfaces with is shown below:

Advanced Drainage Sys. Associated Food Stores

ATK*	Autoliv
Barnes Aerospace Ogden Division*	Boeing
Cerrowire	Chromalox
CT Film	ELKAY West
DCA	DFG
England/Corsair	Fieldcrest Cabinets
Fresenius	Futura
Great Salt Lake Mineral	GSC Casting
Honeywell	Intouch Machining
Iomega	Jetway Systems/FMC
JBT Incorporated	Kimberly-Clark
L3 Communication*	Layton City
Lifetime Products	Naptech
National Standard	Northrop Grumman
Orbit	Parker Hannifin
Petersen, Inc.	Precision Plating
Promold	Richards Sheetmetal
Skydandee Mfg.	Smith's Frozen Dairy Plant
Syro	Tech Steel
Wavel Huber Wood Prod.	Wells Cargo
Westec*	Western Coating
Western Zirconium	Williams International
W.R. White Company	Zero Enclosures

* Companies with current members on the Industrial Advisory Committee – See Appendix E.

Summary of Industrial Advisory Committee (IAC) Minutes

The last IAC meeting for the program was held on October 24, 2012. The following items were discussed at this meeting:

- The current degree requirements and course schedule were distributed. Recent changes to the Design Engineering Technology Program, including program name change, addition of a DET 3000 BIM III course, and modified course titles were also presented.
- CATIA is updating to V6 and the committee members were asked if they preferred V5 or V6. V6 is similar to V5, but has pdm. The committee was also asked whether or not the program should teach two semesters of CATIA or one semester of CATIA and then teach another software for the second semester (ie NX).
- An overview of the architectural curriculum and software taught in each course was presented. Autocad, Revit, and Navisworks are all taught. There was discussion regarding the BIM curriculum, internships and full-time positions. An internship is not a requirement like it is in the CMT program.
- The committee members took a survey regarding the ABET accreditation requirements.

I. Results of Previous Program Reviews

Problem Identified	Action Taken	Progress
Issue 1	Previous 5 Year Program Review:	
	Year 1 Action Taken:	
	Year 2 Action Taken:	
	Year 3 Action Taken:	
	Year 4 Action taken:	
Issue 2	Previous 5 Year Program Review:	
	Year 1 Action Taken:	
	Year 2 Action Taken:	
	Year 3 Action Taken:	
	Year 4 Action taken:	

Summary Information

The previous program reviews were not available so there is no information available regarding any actions taken based on those reviews. The program depends heavily on ABET accreditation and the only information submitted in the last cycle was the final ABET report.

J. Action Plan for Ongoing Assessment Based on Current Self Study Findings

Action Plan for Evidence of Learning Related Findings

Problem Identified	Action to Be Taken
Issue 1	Current 5 Year Program Review:
	Year 1 Action to Be Taken:
	Year 2 Action to Be Taken:
	Year 3 Action to Be Taken:
	Year 4 Action to Be Taken:
Issue 2	Current 5 Year Program Review:
	Year 1 Action to Be Taken:
	Year 2 Action to Be Taken:
	Year 3 Action to Be Taken:
	Year 4 Action to Be Taken:

Summary Information (as needed)

Action Plan for Staff, Administration, or Budgetary Findings

Problem Identified	Action to Be Taken
Issue 1 Lack of funding for full-time faculty.	Current 5 Year Program Review:
	Year 1 Action to Be Taken:
	Year 2 Action to Be Taken:
	Year 3 Action to Be Taken:
	Year 4 Action to Be Taken:
Issue 2	Current 5 Year Program Review:
	Year 1 Action to Be Taken:
	Year 2 Action to Be Taken:
	Year 3 Action to Be Taken:
	Year 4 Action to Be Taken:

Summary Information

Since the program has no control over how funding is allocated for faculty positions, there is no action that they can take that will address this situation.

K. Summary of Artifact Collection Procedure

Artifact	Learning Outcomes Measured	When/How Collected?	Where Stored?
Final Project Rubric	1-11	Bi-annual	electronic copies

Summary Information (as needed)

APPENDICES

Appendix A: Student and Faculty Statistical Summary

	2009-10	2010-11	2011-12	2012-13	2013-14
Student Credit Hours Total	4,009	3,822	4,366	4,758	5,394
Student FTE Total	133.6	127.3	145.5	158.6	179.8
Student Majors	160	173	167	148	134
Program Graduates					
Associate	5	9	3	1	5
Baccalaureate	13	15	19	16	11
Student Demographic Profile					
Female	37	45	36	34	25
Male	123	128	131	114	109
Faculty FTE Total	4.57	3.99	4.45	4.41	4.74
Adjunct FTE	0.57	0.99	1.45	1.41	1.74
Contract FTE	4.00	3.00	3.00	3.00	3.00
Student/Faculty Ratio	29.24	31.93	32.70	35.96	37.93

Note: Data provided by Institutional Research

Summary Information (as needed)

Appendix B: Contract/Adjunct Faculty Profile

Name	Gender	Ethnicity	Rank	Tenure Status	Highest Degree	Years of Teaching	Areas of Expertise
John Junlander	M	W			BS		
Marni Tobin	F	W			BS		
Jennifer Lanzetti	F	W			BS		

Summary Information (as needed)

Appendix C: Staff Profile

Name	Gender	Ethnicity	Job Title	Years of Employment	Areas of Expertise
Roger Anderson	M	W	Technician	24	
Cordell Gold	M	W	Technician	1	
Pat DeJong	F	W	Admin. Spec.	9	

Summary Information (as needed)

Appendix D: Financial Analysis Summary

Department	2009-10	2010-11	2011-12	2012-13	2013-14
Undergraduate					
Instructional Costs	413,451	314,664	323,562	313,820	315,445
Support Costs					
Other Costs					
Total Expense	413,451	314,664	323,562	313,820	315,445

Note: Data provided by Provost's Office

Summary Information (as needed)

Appendix E: External Community Involvement Names and Organizations

Name	Organization
David Bailey	Destination Homes
Jason Barker	Barnes
Gordon Cumming	L-3 Communications
Tom DeJong	WesTech Engineering
Roger Jackson	FFKR Architects
David Johnston	Daimler Trucks
Jennifer Lanzetti	Jacobsen Construction
Kirt Merril	Nilson Homes
Mike Plaudis	Big D
Dan Schmelling	Arete.dbl
Melissa Thiessens	GSBE Architects
Alan Wadge	ATK
Kelby York	York Engineering

Appendix F: External Community Involvement Financial Contributions

Organization	Amount	Type
Perkins – US Dept. of Education	$16,900	Grant
Mark Graves	$40,000*	Donation
J D Machine	$50,000*	"
David Roubinet	$2,800/yr*	"
Autoliv	$5,000/yr*	"
Parker Aerospace	$5,000/yr*	"
Barnes Aerospace	$2,500/yr*	"

*For the Engineering Technology Department and shared among the four programs in the department.