

Weber State University Program Review
Design Engineering Technology Program Response to Review Team Report
By Glen West

Program Overview

The Design Engineering Technology Program (DET) at Weber State University offers Associate of Applied Science and Bachelor of Science Degrees with the opportunity for students to obtain a Bachelor of Integrated Studies with an emphasis in Building Information Management. The program fills a vital role in the local economy as is evident with the extensive list of community support and local employers of students and graduates.

Students have access to computer labs with software currently used by both the academic and industry communities. Students are encouraged to explore the applications of software in a variety of areas and industries such as (1) 3D Modeling, (2) CAD/CAM applications, (3) Building Information Modeling, and (4) Graphic Presentations and Animations. The software used in these applications is readily available to the students.

The mission of the program is to provide students with a solid theoretical background, supplemented by practical experience. The aim being to prepare each student to enter the workplace and/or continue his or her academic pursuits. Each graduate from the program is expected to obtain a mastery of a variety of software tools, and to demonstrate his or her knowledge of academic interests and career goals through oral, written, and graphic communications, and to exhibit a desire for lifelong learning.

a. Program Response: Agree.

Program Strengths

The most pronounced strength is that the faculty have industry work experience along with academic credentials. Evidence of a supportive budget is present to maintain equipment and supplies. There is strong support from local industry, through the advisory committee and the hiring of graduates. All senior students must complete a significant capstone project prior to graduation. These capstone projects require that the student implements appropriate technology, understanding and skills in the development of his or her project. These projects develop leadership, teamwork, and creativity through the design process.

Completion of the program can be obtained within a four year period, 64 -66 credits for the AAS degree and 125 for the BS degree.

The syllabi for the various course exhibit a continuity of purpose. There is evidence of knowledge and skills being built or increased from one course to the next. Each course challenges the student.

The current faculty have a wide range of professional and academic experiences, creating a diverse group of instructors that collaborate and interact well with one another.

a. Program Response: Agree.

Program Challenges

The faculty are all teaching overload contracts. This limits the amount of time a faculty member has to advise or assist students. It also can contribute to workplace burn out and low performance in the classroom. Over the last 5 years, the budget for the program has decreased by approximately 20% despite the increase in student enrollment.

a. Program Response: Agree. The hiring of one (1) additional, full-time, Design Engineering Technology faculty member would facilitate more uniform teaching loads across the entire program, thereby increasing the quality of instruction, thus supporting the maintenance and growth of already successful program.

Areas where Standards were not met

The standards are all met, however the team identified a few areas of concern. One area of concern is the amount of time that faculty have to work with students outside of the classroom. Currently an adjunct instructor is helping to maintain an FTE of 12 credit hours of instruction for each of the three full time faculty members, however, the adjunct instructor is not required to mentor or advise students with that work load being returned to the full time faculty. The Architectural aspect of the program is managed by one (1) full time instructor. This will not allow growth in this area since there is only one instructor's point of view and course offering. Students should have at a minimum two different points of view from department instruction. Another concern is the lack of evidence of how the mission statement is reviewed through a process of self-assessment and improvement.

a. Program Response: Disagree. Full-time advisement in terms of guiding students through the process leading to successful completion of either the AAS or BS degree is provided by the program advisor, and no further advising support is required.

b. Program Response: Agree. With regard to the Architectural component of the program, students should have the opportunity to be influenced by the beliefs and practices associated with additional faculty in this area. This, again, would require additional resources in terms of faculty resources, on the order of a ratio of 11 Product Design and Development courses to 6 Architectural courses.

c. Program Response: Disagree. With respect to Continuous Improvement, the program currently has a system in place that quantifies the self-assessment and improvement process, modelled according to guidelines recommended by the Accreditation Bureau of Engineering and Technology – Engineering Technology Accreditation Commission (ABET-ETAC).

Recommendations for Change

There needs to be an allocation of funds to support the implantation and adaptation of new technology into the curriculum. Technology continues to advance as well as the software used in the program and a plan should be in place to continue with state-of-the-art software and equipment.

The hiring of 1 additional full time instructor to assist with student capstone project, advising, and teaching in the architectural aspect of the degree.

ABET outcomes are only covered in the DET senior Project. Integration of these outcomes should be introduced and included in other DET coursework and projects.

Evidence of faculty/department meetings that address achievement of learning outcomes and areas for self-improvement through minutes are recommended.

Learning outcome 5 – work on teams is only present in the senior project. Examine areas in other courses and projects where students can experience and perfect working in a team environment prior to the capstone / senior project.

The meeting minutes provided for the most recent Industry Advisory Committee (IAC) is listed as October 24, 2012. It is recommended that the IAC be convened once again during the 2015-16 academic year. It is also recommend that the IAC be convened on an annual basis.

a. Program Response: Disagree. The program is kept abreast of current technological advances via the Professional or Industrial Advising Committee, in addition to graduates who may, or may not, be members of said committee. Committee meetings are conducted on an annual basis.

b. Program Response: Agree. A new faculty member, either full-time, tenure track, or adjunct, is required in order to add depth in terms of educational value with respect to the architectural element of the program. A 0.75 FTE faculty member would suffice.

c. Program Response: Disagree. ABET-ETAC outcomes a, b, f, g, h, i, and j. are addressed in in multiple courses across the entire spectrum of required, as well as optional courses prescribed for both the AAS and BS degrees.

d. Program Response: Disagree. Meetings are conducted on a regular basis, however, it is the opinion of the program advisor, that minutes from these meetings serve no useful purpose, with the possible exception of monitoring attendance.

e. Program Response: Disagree. Specific courses address teamwork concepts and projects (i.e. DET 3000 Green Building Methods and Certification).

f. Program Response: Disagree. The documentation regarding the latest Professional or Industrial Advising Committee meeting, provided in the original review materials, reflected the second to the last meeting that was held. The most recent meeting was held on March 6, 2015.

Additional Recommendations and Comments

Standards:

A- Mission

- a. The mission statement identifies the outcomes and the skills needed for the degree and future careers. It would serve better if more succinct, so that students could easily recognize it in their classes. What is currently written is more of a vision statement and is valuable but not fully transferable to the students for ownership.

- b. Includes a respect and awareness for the importance diversity and a knowledge of contemporary professional, societal, and global issues, however, there is not a specific reference to period or continual self-assessment and improvement.
- c. The objectives of the program are clearly defined.
- d. The mission of the Design Engineering Technology (DET) Program are consistent with the core themes of Access, Learning, and Community.

a. Program Response: Disagree. The information regarding the mission statement for the program is disseminated to students in the form of course outlines, descriptions, and objectives for each course. Similar information is also located in the online version of the Weber State University catalog.

b. Program Response: Disagree. Required courses (i.e. ANTH SS/DV 2010 People and Cultures of the World, GEOG SS/DV 1300 Places and Peoples of the World, and HIST SS/DV 1510 World History from 1500 C.E. to the Present) fulfill this requirement. Self-assessment and improvement is not required by ABET-ETAC in this area.

c. Program Response: Agree.

d. Program Response: Agree.

B- Curriculum

- a. Robust and complete with one course supporting and building to another. The courses within the program cover the appropriate topics for a Design Engineering Technology degree. CAD, Virtual Design, and Tool Design are offered, which covers both the breadth and depth of the field.
- b. The curriculum prepares students for future success.
- c. The DET program requires significant software/equipment support. Maintaining the quality of the program relies heavily on future efforts to acquire state-of-the-art technology.
- d. DET offers courses for its own majors and service courses for MFET and MET majors in a timely and appropriate schedule.

a. Program Response: Agree.

b. Program Response: Agree.

c. Program Response: Agree. Funding is scarce, specifically in the areas of design software, rapid prototyping equipment, and increased computing horsepower for student computer laboratories.

d. Program Response: Agree.

C- Student Learning Outcomes and Assessment

Learning Outcomes

- a. Strong evidence of continued improvement and growth. A constant achievement of 80% of the class or higher, scoring a 75% or high on exams. The breadth of the learning outcomes cover the program goals.
- b. The student outcomes emphasize mastery of the material presented in the program, as well as ongoing professional goals related to an awareness of broader global issues. However, there is room for improvement in the design and documentation of architectural plans using Revit, or other industry standard software.
- c. The curriculum map provides comprehensive information about the completion of learning outcomes for each course.

a. Program Response: Agree.

b. Program Response: Agree/Disagree. Agreement regarding the first statement. Disagreement in terms of the statement regarding the “documentation of architectural plans using Revit, or other industry standard software”. Currently, required architectural course require instruction covering both AutoCAD and Revit software types.

c. Program Response: Agree.

Assessment

- a. The measures are identical to ABET assessment criteria.
- b. The program provides “closed loop action forms” for courses that summarize student learning outcomes and continuous improvement. Measures of learning are contained on these forms.
- c. These data are being gathered and reported adequately by the department.

- d. Faculty responses and recommendations for improvement are provided individually. Documenting evidence of faculty meeting as a group to address the achievement of learning outcomes is recommended. This would show evidence and recognition of the student engaged in lifelong learning as well as program improvement.
- e. Continuous improvement is an integral part of the program's efforts.
 - a. Program Response: Agree.
 - b. Program Response: Agree.
 - c. Program Response: Agree.
 - d. Program Response: Agree/Disagree. Agreement with the first statement. Disagreement with the second statement in that faculty are assigned to their current teaching loads based on educational or industrial experience, and therefore are considered experts in their assigned fields of study, but are not necessarily experts in the arena of other faculty. Also, the third statement does not make sense.
 - e. Program Response: Agree

D- Academic Advising

- a. Students are required to meet annually with their advisor. In this way the program monitors the advising of students effectively.
- b. Incidences of mid-advising are rare. Students are required to meet with a faculty advisor at least once a year.
- c. Access to advising is ongoing and covers both career guidance and course selection.
 - a. Program Response: Agree.
 - b. Program Response: Agree
 - c. Program Response: Agree

E- Faculty

- a. Faculty size may not be sufficient to support the expected DET, MET, and MFET majors in the future.

- b. Full-time faculty is very competent and can sustain the stability of the program, with the caveat that growth should be handled by hiring new faculty as needed.
- c. The faculty have required and needed industry experience, academic credentials. The combined 2 Master's and 1 (ABD) Doctorate faculty members are both academically and professionally qualified.
- d. The faculty demographic profile indicates an awareness of diversity.
- e. Sufficient mentoring activities are provided. Faculty are counseled by the program coordinator and by the program chair. Adjunct faculty also have access to mentors.
- f. Teaching workloads for current DET faculty are very high and compromise their ability to fulfill scholarship and service obligations.
- g. The DET program subscribes to good teaching standards, and offers professional development in the areas of innovative instruction.
- h. The DET program maintains an effective ongoing review of faculty. 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 dept. chair.

a. Program Response: Agree. One (1) full-time tenure track or one (1) 0.75 FTE faculty member, would bolster the efforts of the program as well as augment program strength and abate faculty fatigue.

b. Program Response: Agree.

c. Program Response: Agree.

d. Program Response: Agree.

e. Program Response: Agree.

f. Program Response: Agree.

g. Program Response: Agree.

h. Program Response: Agree.

F- Program Support

- a. The DET program has one and a half technicians, one secretary, and one student aide, which is adequate to meet the current needs of the program.
- b. Staff are supported and encouraged to seek professional development.
- c. There is evidence of funding to maintain the current facilities, equipment, and software. Equipment and facilities are an ongoing concern for technology programs. Establishing a consistent future funding strategy to keep the department supplied with state of the art PC's and software should be a high priority.

a. **Program Response: Disagree.** The program has one (1) technician distributed over four (4) Engineering Technology programs. The department has one (1) professional administrator distributed over four (4) Engineering Technology programs. At any given time, during the Fall and Spring semesters, the program may share as few as zero (0) student aides to as many as three (3) student aides, evenly distributed over at least four (4) Engineering Technology programs. These aides may also, at times, support students who have declared Pre-Engineering as their major.

b. **Program Response: Agree.**

c. **Program Response: Agree.**

G- Relationships with External Communities

- a. The program has a strong, documented relationship with companies that employ its graduates.
- b. The DET program maintains an active and vibrant Industry Advisory Committee (IAC). The IAC helps the program to design and refine current curriculum.
- c. Meeting minutes are provided, but the most recent gathering is listed as October 24, 2012. It is recommended that the IAC be convened once again during the 2015-16 academic year. It is also recommend that the IAC be convened on an annual basis.

a. **Program Response: Agree.**

b. **Program Response: Agree.**

c. **Program Response: Disagree.** The documentation regarding the latest Professional or Industrial Advising Committee meeting, provided in the original review materials,

reflected the second to the last meeting that was held. The most recent meeting was held on March 6, 2015.

H- Results of Previous Program Reviews

- a. Previous program reviews were not available so there is no information about any actions taken based on those reviews. This area was not evaluated by the review team.

a. Program Response: Agree.