

HSU Academic Department Reports – Applied Technology December 30, 2008 - Program Prioritization

The departmental reports provide context for the academic programs administered by the department, and will be considered in conjunction with the program reports for final program ranking. This report is to be completed by September 30. Use 12-point Times New Roman with 1.5 line spacing.

I. Departmental History, Mission, and Goals

Insert the department mission statement and the department goals. In addition, provide a brief (2 page limit) overview of the departmental history with emphasis on the last 5 years.

See following two pages.

Department of Applied Technology Mission Statement and Academic Goals

Mission

The mission of the Applied Technology program is to educate and prepare individuals for leadership roles in technological fields including, but not limited to, Green Building, Industrial Design, and Manufacturing and Operations Management. Our graduates will use innovation, creativity, applied practical knowledge, and the concepts of sustainable development to solve social problems and satisfy human needs. The integration of analysis, design, development, and production across all three options provides the educational basis for complete, well rounded technical problem solvers. The AT program capitalizes on the power of a hands-on/minds-on pedagogy that challenges students to apply theoretical knowledge in the pursuit of design objectives while engaging in the real work of technologically advanced industries. Whether green building, design or niche manufacturing, the AT mission is to infuse an ethos of social and environmental responsibility in the context of profitable enterprises. Through the AT program, students become expert at analyzing technical and management problems/opportunities, identifying the information needed to develop effective solutions, and mastering the required material at a level that produces an optimal outcome. With their technical background, management skills, and problem solving abilities graduates of the AT program are effective contributors to the region's social and economic future.

The educational experience provided is: professional, scientific, interdisciplinary, experiential, and entrepreneurial.

Academic Goals: The overall goal is to prepare students to become managers and leaders in Technological fields by providing educational content and experiences which:

- Develop practical knowledge through contextually specific hands-on applied, practical, and experiential learning activities and laboratories
- Encourage the development of scientific thinking, innovation, and experimentation in the pursuit of technical knowledge through undergraduate research
- Support career preparation and life-long learning through individualized study, internships, special projects, and team-based experiences in the definition and solution of local socio-technological problems
- Instill the fundamentals of technical and scientific writing, professional oral presentation, and essential professional communication skills.
- Develop sound critical thinking and reasoning skills that are congruent with the standards and expectations of technologically-related professional development associations

History: Applied Technology (formerly Industrial Arts & later Industrial Technology) was one of the earliest programs at HSU. From its inception to the 1980s, the primary focus of the program was to prepare teachers for high school programs around the state. During the 1980's the curriculum evolved from a teacher preparation focus with an emphasis on skill development to an industrial management and design program. As a result, students graduating from the IT program were more likely to take higher paying jobs with the title of engineer or manager as they were to enter the teaching profession.

Between 1992 and 2004 the program was denied TT faculty replacements. The last TT faculty member from the period before 2000 retired in 2003. Despite the loss in funding, the demand for the practical, academic, and applied education provided by IT continued. Throughout the decade, a strong, vocal core of students, local industry leaders and representatives from the K-12 education system repeatedly spoke up to keep the program afloat. In 2000, more than eighty members of the business and education community, joined government officials in attending an academic summit to communicate the importance of the program to the north coast. In 2004, an ad hoc committee examined the potential and value of the IT program to HSU and the surrounding communities. The analysis was comprehensive and mirrored many of the same criteria as are being considered as part of the current Program Prioritization Process. The result of that analysis was a recommendation to infuse resources to support the program as it modernized its facilities and curriculum. Between 2005 and 2008, Dean Susan Higgins invested in both faculty and equipment to bring the program up to date. As a budget saving measure, the IT program was merged with the School of Business in 2006. Also in 2006, the name was changed to Applied Technology.

Until 2005, the AT curriculum was constrained by the requirements of the California Teacher Credentialing Commission. In order to meet the requirements of a "waiver" major, the AT curriculum had to include two levels of coursework in each of five traditional areas of High School Shop. This was

important as high school teachers often were required to teach multiple subjects where safety, maintenance, and skill were essential to the school and its students. In 2005, the AT program decided to reduce its commitment of resources to the teaching path as few students were entering with that career objective. A partnership with College of the Redwoods was developed to allow students who wanted to pursue a teaching career the opportunity to complete the required courses while providing flexibility for the HSU AT program to refocus its curriculum.

In 2006/07 there were two options, Technology Management using School of Business classes and the Applied Technology/Education Option. The Applied Technology/Education Option further divided into construction or manufacturing pathways. Both options included the broad technical base originally designed for future Industrial Technology teachers in K-12 schools.

The revised curriculum first appeared in the 2006/07 catalog. The core was reduced to one course in each of the technical areas with a shift in emphasis from developing machining skills to analytical processes investigating production management in the context of materials and machine tool technology. The courses continue to provide some hands-on laboratory activities that orient the students to the production processes. This aspect of the curriculum is one of the key features that support the development of technical problem solving skills that employers value in our graduates. The advanced metals course was replaced with a manufacturing management class. An industry Practicum and a GE course in Socio-technical thinking were added. Three AT options were identified: Construction Management, Industrial Design, and Manufacturing & Operations Management. The upper division coursework was redesigned to provide a greater focus on the development of project, product, and organizational management.

With Mark Doggett's departure in 2006, and the hiring of two Mechanical Engineers to teach AT courses and manage the program, the curriculum revision took on some characteristics of an engineering program. As a result, there is a greater integration of engineering mathematics and approaches in the curriculum. While the development of a Mechanical Engineering Curriculum had been proposed, the program has chosen to suspend that proposal and use the available resources to strengthen the three pathways currently in place. At the same time, the successful integration of engineering concepts over the past couple of years has led to plans to increase the mathematics and chemistry requirements.

Over the past five years, the AT program has acquired prototyping and computer controlled machine tool technology. A Green lab, a new forward looking curriculum and a national grant to update the program have been secured over the past two years. At the same time, the uncertain conditions at HSU, the ongoing budget cuts, and personal concerns led to the departure of both tenure-track faculty members at the end of the 2007/2008 academic year. At this time, a long-term lecturer is the interim

program leader. A faculty search that was approved for the 2008/2009 to hire a third TT faculty member year has been suspended pending the results of the Program Prioritization Process.

II. Departmental Faculty and Staff

Applied Technology Dept Instructors -- AY Average Count of Appointments facpos_AT report generated: 22-FEB-08						
Appt Category	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lecturer	6	6	4	4	5	5
Assist Prof	0	0	1	1	2	2
Volunteer	0	0	1	0	1	0
Total	6	6	6	5	8	7

Applied Technology AY average FTEF (time base totals) facpos_AT report generated: 22-FEB-08						
Appt Category	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lecturer	2.48	2.69	2.57	2.22	1.38	1.35
Assist Prof	.00	.00	1.00	1.00	2.00	2.00
Volunteer	.00	.00	.02	.00	.02	.00
Total	2.48	2.69	3.58	3.22	3.39	3.35

Applied Technology department release/assigned time facpos_AT report generated: 22-FEB-08						
Assignment Description	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Excess Enrollment (=>75)	.00	.00	.00	.00	.06	.03
New Preparations	.00	.00	.13	.00	.20	.20
Instr-Related Services	.00	.00	.00	.00	.10	.00
Advising Responsibilities	.07	.06	.03	.06	.00	.00
Instr-Related Comm Assignmts	.00	.10	.00	.00	.00	.00
Dept Chair AY, Leaders/Dir.	.00	.00	.20	.20	.20	.10
Dept Chair - 12mo	.00	.00	.20	.20	.00	.00
Total	.07	.16	.56	.46	.56	.33

Personnel (At least .5 FTE)

Name	Position	Description of Specialty and Key Contributions (no more than 100 words per person)
Dr. Doggett	Program Leader	Manufacturing. Contributed to revision of curriculum completely; rename the program Applied Technology; and hired Dr. Russell. Departed HSU in 2007.
Dr. Russell	Program Leader	Mechanical Engineering and Construction Management. He also revised the curriculum and reduced the number of options. Departed HSU in 2008.

Dr. Raoufi	Assistant Professor	Mechatronics. Robotics. Engineering/Product Design Methodologies. Biomedical Engineering. CAD/CAE. Manufacturing Processes and Systems. He collaborated with Dr. Russell in designing the new curriculum of the AT program. Departed HSU in 2008.
Bill Wilkinson	Lecturer	Program leader in 2003-2005, 2008/2009. Computer Assisted Design, Computer Assisted Manufacturing, CAD, and Industrial Design; he also has a background in Construction.
Sarah Hallowell	Lecturer	Wood Shop. Contributes by teaching IT 104 (Beginning Wood).
Debi Johnson	Admin. Support	Contributes to all aspects of office support for Applied Technology.

III. Recruitment and Retention

Describe any specific actions (other than HOP or similar standard efforts) the department has taken to recruit and/or retain students, particularly diversity students and/or students who are underrepresented in your discipline. What have been the results of those actions?

As is clear from the doubling of majors over the past seven years, the program has been increasing its outreach efforts through club and CCAT activities and at the same time students have been responding to the changes in the curriculum. As the technology was modernized (e.g., 3D design, CAD/CAM machine controls that convert graphics to machine language in order to build prototypes, etc.), technically oriented students have been attracted to the program. In addition, the IT 104 GE course is an important opportunity that continues to be a successful route for recruiting majors. AT is involved in all the typical events: HOP, HSU tours, College Events for HS students, and has attended a variety of High School events to encourage seniors to attend the program once they graduate. The AT program recruits an ethnically and economically diverse student population. Ethnic minorities represent 36% of the AT majors, double the HSU average. AT also has a significantly higher proportion of minority students graduate than HSU at large.

IV. Learning, Curriculum, and Assessment.

List the student learning outcomes for your academic programs. Then for each learning outcome that has been assessed, provide a summary paragraph that includes the methodology and results of the assessment.

All students graduating from the program will:

1. Understand the fundamentals of technological systems and demonstrate a high degree of technological literacy.
2. Possess organizational, management, social, and adaptation skills that support institutional learning, motivation of others, and changing technological environments.

3. Apply an entrepreneurial mind set to issues and problems using strategic and critical thinking, systems approaches and theory, and the integration of technical knowledge.
4. Become accomplished decision makers who understand the nature of change; conduct thorough research; and apply systematic thinking, statistical methods, analysis, and synthesis.
5. Behave ethically; reflecting carefully on their actions with regard to social and environmental responsibility while attaining an appreciation for the pitfalls and consequences of technology, both intended and unintended.
6. Understand the multidisciplinary contributions to the body of knowledge in technology (including, but not limited to, math, science, engineering, and the applied human sciences)
7. Attain basic skills in the fundamental technologies such as electricity, mechanics, machine tool, energy, industrial materials and processes, design, and industrial health and safety.
8. Possess fundamental skills in technical writing, oral presentation, quantitative reasoning, and project management.
9. Utilize creative expression and interpretation in the design and the assessment of form and function.
10. Adhere to the standards and expectations of the professional community through ongoing professional development and represent the University and the Department as a Technological ambassador.

The ongoing curricular revisions made by two successive program leaders with very different visions have made formalizing assessment of learning outcomes difficult over the past several years. Many of the changes being introduced into the curriculum are based on input from students, alumni and employers of our graduates. Surveys have been used to evaluate the effectiveness of the program and identify areas of weakness. While these do not meet the criteria for effective measures of student learning outcomes, they have been the best possible approach as the transition to a new curriculum was undertaken.