

Linking Engineering Technology with a Business Administration Program

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Abstract — The paper describes the curriculum of the individualized option in the baccalaureate Business Administration program. The individualized option is a multidisciplinary curriculum which links the Mechanical Engineering Technology and Electrical Engineering Technology associate degree programs with the baccalaureate Bachelor of Science in Business degree program. Graduates from this program will be prepared for management positions in the manufacturing industry.

Index Terms — About four, alphabetical order, key words or phrases, separated by commas (for suggestions Preparation of papers, camera-ready, two-column format, ICECE format).

INTRODUCTION

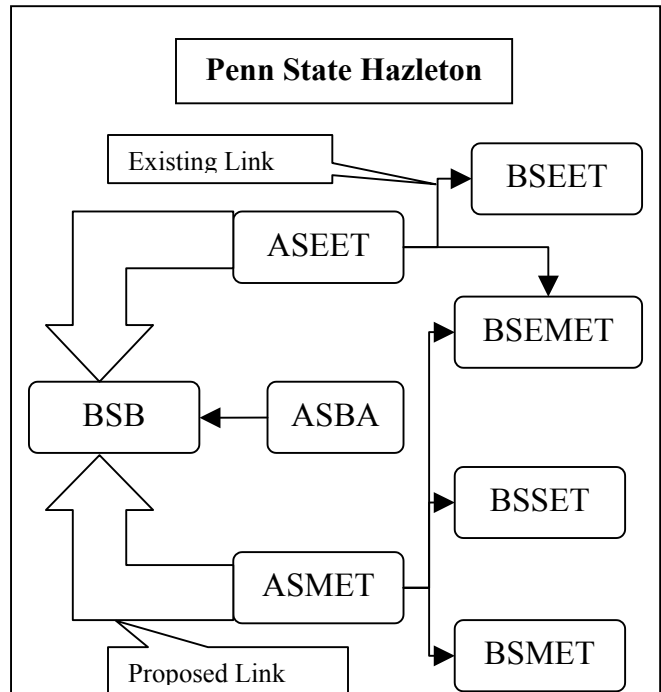
The competitive job market of the 21st century forces college graduates to seek and develop unique and rare skills. The acquisition of these skills is often the deciding factor in achieving employment goals. In a constantly changing work environment, these interdisciplinary skills are more important than ever before. As a result of this situation, professional societies and accrediting bodies encourage and support interdisciplinary projects in the curriculum.

CURRICULAR ISSUES

Penn State Hazleton offers traditional mechanical technology and electrical technology programs. These programs are ABET accredited and are offered in Hazleton at the associate degree level. The graduates of these programs can either seek employment or continue their education at the baccalaureate level. A majority of the students continue their education in the baccalaureate degree programs (Fig. 1).

Unfortunately, those baccalaureate degree options are not available at Penn State Hazleton. Depending on the choice of major, most students continue their education at the Capital College in Harrisburg, the Altoona College, or the Berks-Lehigh Valley College. Penn State Hazleton also offers associate and baccalaureate degree programs in business administration. Similar to the engineering

technology students, business administration students who



ASEET: Electrical Engineering Technology – Associate
 ASMET: Mechanical Engineering Technology – Associate
 ASBA: Business Administration – Associate

FIGURE 1

EXISTING AND PROPOSED LINKS
 BSEET: Electrical Engineering Technology – Baccalaureate
 BSEMET: Electro Mechanical Engineering Technology – Baccalaureate
 BSSET: Business Administration – Baccalaureate
 BSMET: Mechanical Engineering Technology – Baccalaureate
 BSB: Business Administration – Baccalaureate

By linking these two programs, students at Hazleton in the Engineering Technology programs are afforded the opportunity to complete a baccalaureate degree and remain

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at Hazleton. In this two plus two design, Engineering Technology students complete their associate degree and then reenroll in the baccalaureate degree the following semester. The transition is virtually seamless and allows students to complete both the associate and the baccalaureate degrees in approximately nine semesters.

One might think that a conjunction of business concepts with engineering principles is hugely unlikely. The reality is that engineers may be some of the best resources to market and sell various product lines due to the fact that they have the ability to describe the reliability, functionality and needs for buying parts and/or products.

One of the most basic rules in business is the 80/20 Rule. This basically states that 20 percent of a firm's customers are responsible for generating 80 percent of a firm's revenue. Some experts believe that customer retention has a more powerful impact on profits than market share in terms of competitive position in the market place. Some basics of customer retention include: trust building, personal contact, proper installation and training, and seeking customer feedback by follow-up.

It is in the best interest of firms to employ and grow engineers with solid mechanical and/or electrical backgrounds who could communicate to consumers with a firm understanding of the product design and functionality, as well as an understanding of how the use of the product will impact their businesses. This is why the link between engineering technology and business concepts in education is so crucial.

In the 1999/2000 academic year, an agreement was reached between the engineering technology program and the business administration program. This agreement created an individualized option in the baccalaureate BSB program. This new individualized option allows ET graduates to enter into the BSB program at the junior level. This agreement created a very valuable and attractive option for associate degree ET graduates.

The curriculum developed for those individual options is shown in Fig. 2. During the first two years the students take engineering technology courses. Business related courses are taken by the students during the junior and senior years. Presently, a number of students are successfully pursuing this option. At the end of the 2003 spring semester, a number of engineering technology students will graduate with a BSB degree. The feedback received from the students who are pursuing this individual option is very positive. The Penn State Hazleton Industrial Advisory Committee supports the program.

BACHELOR OF SCIENCE IN BUSINESS / 2MET OPTION			
Semester 1		Semester 2	
EET 101/109	4	SpCom 100	3
ET 2	1	* IET 101	3
Math 81	3	EGT 114	2
EGT 101/102	2	Math 82	3
Engl 15	3	AHS	3
AHS	3	* MCHT 111	3
	16		17
Semester 3		Semester 4	
* MET 206	3	MET 210 W	3
MCHT 213	3	IET 215	2
MCHT 214	1	Phys 151	3
EGT 201	2	AHS	3
Math 83	4	Engl 202D	3
Phys 150	3	NatSci	3
IET 216	<u>2</u>		
	18		18
Semester 5		Semester 6	
BA 321	3	BA 322	3
* MKTG 301	3	* BLOG 301	3
* MGMT 301	3	ECON 2 or 4	3
MIS 204	2	ACCTG 211	4
* FIN 301	3	BA 243	4
ECON 2 or 4	3		17
	17		
Semester 7		Semester 8	
BA 421	3	* BA 422W	3
IB 303	3	BA 495	6
MSIS 200	4	Engl 419	3
SpCom 352	3	MIS 103	3
HPE	4	Arts, Humanities	3
	17		18
Summer			
Arts, Humanities	3	BA 495 (Internship)	6
Tech Elective	3	can be completed in summer	
* Course requires a grade of "C" or better			

The graduates from this individualized, interdisciplinary program will have the skills necessary to seek manufacturing management positions in industry. The multidisciplinary background of the graduates will allow them to work and communicate effectively with the engineering and technical staff. The graduates will also be able to work effectively with the marketing and accounting staffs as well as with financial institutions.

TABLE I

Since management styles have changed dramatically over the last few decades, with a team of directors leading organizations rather than one sole leader as was done in the past, it makes perfect sense to include individuals with quantitative abilities as one or more of the team members. Due to this current need in almost all businesses, it has become clear that quantitative thinkers need to understand communication and management styles to be effective and successful. Teams and groups now dominate in most work settings for decision making, whereas individual efforts were once hailed. Since business in general has become more complex, with innovative technology that is constantly changing and firms diversifying product and service lines of business so rapidly to stay competitive, it seems to follow logically that engineers should be an integral part of the upper echelon of individuals who lead an organization. Probabilistically speaking, to make engineers more successful, the event of business concepts and applications (call it Event A) is the perfect complement to the event of engineering talent (Event B). Given that these are the only two events in the sample space, the probability of Event A in union with Event B ($P(A \cup B)$) will be equal to $P(S)$, the probability of the sample space, which is a perfect number 1

CONCLUSIONS

The individualized option of the Bachelor of Science in Business program, which has been described, is expected to increase the enrollment in both that program and the engineering technology programs. Penn State Hazleton will survey graduates and employers after a significant number of graduates enter the workforce.