

AC 2007-544: A COURSE IN CAREER PREPARATION AND BUSINESS SKILLS IN AN ENGINEERING TECHNOLOGY BACCALAUREATE DEGREE PROGRAM

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A Course in Career Preparation and Business Skills in an Engineering Technology Baccalaureate Degree Program

Abstract

This paper describes the planning and implementation of a one-credit Engineering Business Skills course intended for baccalaureate degree students in Electro-Mechanical Engineering Technology (EMET) at the Altoona College of The Pennsylvania State University. The elective course, developed cooperatively by the Director of Career Services and the EMET Program Coordinator during the spring 2006 semester, is designed to address career-oriented topics. The purpose of the class is threefold: to engage students in the job search process, to educate students regarding career planning activities and the resources available to them, and to better acquaint students with the skills necessary to succeed in industry.

Topics for the course include development of career goals, resume creation, marketing strategies, professional correspondence, job search strategies, interviewing skills, business etiquette, multicultural experiences, graduate school options, professional topics, and lifelong learning. As a part of the course, students attended two different career fairs: the Fall Career Fair at The Pennsylvania State University in University Park, PA, and the Business and Engineering Career Fair at Penn State Altoona.

The course was offered in fall of 2006 to eleven senior-level students in the EMET program. Students were surveyed during the first class period to gauge their own assessment of their level of career planning preparedness for a variety of activities related to locating employment. An additional survey was administered at the conclusion of the course in order to assess shifts in student attitudes as well as the effectiveness of the course. Data from both survey instruments will be presented in this paper.

Background

Penn State Altoona is one of 19 satellite campuses in the Pennsylvania State University system, which maintains its administrative and research hub at the University Park campus. The Altoona campus is located approximately 45 miles southwest of University Park, and is the geographically closest of the satellite campuses in the Penn State system. With 150 acres and more than 20 buildings, Penn State Altoona offers approximately 4000 students the opportunity to complete 20 baccalaureate and eight associate degree programs ranging from Arts and Humanities to Engineering. In Engineering Technology, two associate degree programs are offered, in Mechanical Engineering Technology and Electrical Engineering Technology. In addition, one baccalaureate degree program in Electro-Mechanical Engineering Technology is available at the campus. Approximately 30 students graduate each year with a BSEMET degree (Bachelor of Science in Electro-Mechanical Engineering Technology.) In the eleven years since the inception of the BSEMET program, approximately 300 students have earned the degree.

In addition to the many degree programs that can be completed at Penn State Altoona, the college also offers the first two years of over 180 Penn State majors, including 13 in the College

of Engineering. Engineering students then complete their degree programs at the University Park campus or another Penn State location offering that degree program.

Course Planning

Traditionally, BSEMET students have been very successful in finding a wide variety of employment opportunities throughout the life of the program. However, it is apparent that students could benefit from a structured course in career planning. To better address this need, Penn State Altoona's Director of Career Services, Rebecca Maguda, and the EMET Program Coordinator, Irene Ferrara, worked cooperatively from February through May 2006 to develop topics for a one-credit course intended for advanced standing EMET students, in order to help prepare them for the process of securing employment as well as succeeding in industry. The original syllabus for the course can be found in Appendix 1.

Course Implementation

In fall of 2006, eleven senior BSEMET students participated in the first offering of the Engineering Business Skills course. The class met for 75 minutes twice per week, for half of the semester. During the first three weeks of class, students engaged in a variety of activities intended to prepare them for the Fall Career Fair at The Pennsylvania State University in University Park, PA, held on September 28, 2006.

Students received information on resume creation, with a number of resumes from past BSEMET graduates provided for students to review and critique. The class worked cooperatively in groups to accurately represent course experiences, project information, and software and hardware experience for inclusion on their own resumes.

After locating a description for an entry-level position of interest, each student met with the Director of Career Services to craft a resume for the position description of his/her choice. Following the resume critique, students made modifications based upon feedback. Next, the BSEMET Program Coordinator reviewed resumes and provided additional comments. Students received input from Career Services personnel as well as engineering faculty to guarantee that the resumes would satisfy both technical and non-technical reviewers. Often in the past, students would seek out either Career Services staff or engineering faculty for informal resume critiques, but this exercise forced them to go through the process of seeking input from both, resulting in enhanced quality of the resumes created.

In the first few weeks of class, students also identified and reflected upon their career goals for the next year, the next five years, and beyond. The class discussed salaries to be expected, potential job options, possible benefits, opportunities for advancement, and lifelong learning. Students and faculty also spent time as a group discussing how to compare and contrast different job opportunities, and how to prioritize the importance of different aspects of particular jobs based upon individual preferences.

Students also learned about successfully working a job fair, appropriate professional dress, assembling professional references, and writing professional correspondence. In class, students

created cover letters and thank you letters cooperatively. Since the BSEMET program is not as common as many other Engineering and Engineering Technology majors, a discussion occurred to prepare students for their two-minute commercial with employers at the career fair. Students developed a quick explanation of the degree program to educate employers at career fairs and interviews. A BSEMET program summary is typically provided by the students to inform employers regarding the program and to be circulated to engineering personnel at various companies.

Some of the class sessions occurred in a computer lab to review web based resources while other meetings took place in a classroom where topical issues were discussed with chairs in a circular format. At the beginning of the semester, students freely expressed themselves in these discussion sessions. As the semester progressed, their comfort level increased, and frequently questions or comments from students resulted in discussions far different from the planned topics for the day. This was actually anticipated during course development, and deviation from planned topics to issues of greater interest to students on any given day was encouraged.

Students attended the Fall Career Fair at The Pennsylvania State University in University Park, PA on September 28, 2006. This annual event provides students with the opportunity to network with representatives of over 500 companies in one location. The BSEMET Program Coordinator attended the event as well to act as a coach to the students if questions arose as well as to promote the BSEMET program to potential employers.

In the second half of the course, students engaged in discussions and presentations involving interviewing skills, job search strategies, business etiquette, multicultural experiences, and graduate school options. Students also participated in mock interviews with a panel of faculty and staff. Prior to the mock interview, students received a rubric in order to establish the structure, identify the important parts of the interview, and provide information on how grades would be assigned. Each student identified a position description, researched a company, and submitted a resume crafted for the position. Faculty and staff then created appropriate questions and met to interview each student for 15 to 20 minutes. Immediately following the interview, students received feedback from interview participants in order to identify strengths as well as to offer methods to improve interview performance. Mock interviews were recorded for student use as well.

An additional in-class exercise involved brainstorming a list of professional topics that might be of interest to students and potential employers. Students developed topical issues in order to provide exposure to industry issues that may actually be discussed during future interviews. Each student then chose an issue to research and present to the class. Examples of topics included the Six Sigma approach, ISO 9000, security clearances, the application process for graduate school, and outsourcing of jobs.

The last course activity was the Business and Engineering Career Fair, offered on October 31, 2006 at Penn State Altoona. Students networked with both local and national employers and connected with companies that have hired past BSEMET graduates. This career fair, offered for the first time in 2006, is intended to be an annual event to provide students at all levels with an

opportunity to locate full-time employment as well as internship options with local or out-of-state companies.

Assessment

Students completed surveys during the first class period to gauge their own assessment of their level of career planning preparedness for a variety of activities related to locating employment. In addition, students completed surveys at the conclusion of the course, in order to determine both how much their attitudes had changed as well as to assess how effective the course was in meeting the aforementioned goals. For each survey, a number of questions utilized the Likert scale, with five possible ratings: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The questions on the original and ending surveys were identical, except that on the original survey, the question asks how comfortable the student is with the activity, whereas on the ending survey, the question asks if the course helped the student to understand how to complete the activity. The original survey results and those at the end of the class can be found in Table 1.

Table 1: Student Assessment Before and After Completing the Course
1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Question	Average Rating before course	Average Rating at conclusion of course
I know how to update my resume to showcase my internship experience and tailor it to potential job leads.	3.6	4.9
I know how to conduct a job search & identify companies that would hire me.	3.4	4.5
I know how to get the necessary training once I begin my chosen career.	3.33	4
I know how to market myself by building a portfolio to show future employers evidence of my skills.	2.9	4.4
I can create an effective cover letter tailored to a specific position description.	3.2	4
I am comfortable with my ability to conduct myself in interview situations.	3.7	4.4
I have a clear idea of my options for continuing my education in graduate school.	3.1	4.5
I am comfortable with my ability to deal with people of all ethnic groups and backgrounds in future employment situations.	4.25	4.4
I am comfortable with my ability to deal with people of both genders in future employment situations.	4.4	4.5
I know how to present information about my strengths and abilities to prospective employers at job fairs.	3.5	4.5
I understand how to dress appropriately for both interviews as well as permanent employment situations.	4.1	4.6
I can compare/contrast employment opportunities based on salary, benefits, location, and other criteria of importance to me.	4	4.3
I can state my career goals for the next year, and for the next five years.	3.7	4.4
I know how to research a company in order to prepare for an interview situation.	3	4.5
I can identify useful questions to ask of company representatives in an interview situation.	3	4.7
I am confident that I will be able to secure employment when I graduate.	3.9	4.6

In every instance, student comfort level in performing each of the activities identified in the survey increased as a result of participating in the course. In addition, students indicate that at the conclusion of the course, they feel prepared to engage in each of the activities listed.

An additional survey question asked how students intended to conduct their job searches. The results, at course beginning and end, can be found in Table 2.

Table 2: Planned Job Search Strategies

Job Search Strategy	Number who intend to use at beginning of the course	Number who intend to use at end of the course
Penn State Altoona recruiting sessions	11	8
University Park recruiting sessions	7	7
Networking	8	7
Newspaper ads	7	7
Employment agencies	2	2
Job hunting on the Internet	11	6
Internship leading to permanent position	4	3
Nittany Lion Recruiting	3	9
Career Fairs	8	10

At the conclusion of the course, students appear to be less likely to participate in Penn State Altoona recruiting sessions and job hunting on the Internet, and more likely to utilize Nittany Lion Recruiting as well as career fairs. Nittany Lion Recruiting is a service for Penn State students and alumni that offers participation in on-campus recruiting interviews, access to job listings for employers not coming to campus, attendance at employer information sessions and presentations, and the ability to post resumes online. The increase in the number who plan to use Nittany Lion Recruiting in the future can be attributed to lack of knowledge about the system and its use before taking the course. The increase in the number who plan to participate in career fairs can be attributed to the fact that for many, Fall Career Days at University Park was their first event of this type. Too often, this type of event is not a comfortable experience for students, so many have to be strongly encouraged to attend. However, once they do participate, the benefits of being able to interface with so many potential employers in one afternoon become obvious, and students do attend each of the fairs that follow.

The survey given at the conclusion of the course also attempts to assess how beneficial specific course activities were. Again, the Likert scale was used, with four possible ratings: Not Helpful (1), Neutral (2), Helpful (3), and Very Helpful (4). The average results are listed in Table 3.

Table 3: Ratings of Course Activities

1= Not Helpful, 2=Neutral, 3=Helpful, 4=Very Helpful

Activity	Rating
Resume creation (listing course experiences, projects, etc.)	3.7
Discussion of job options – salaries, benefits, opportunities for advancement, etc.	3.6
Job search strategies	3.6
Attending Penn State Career Days at the Jordan Center	3.6
How to work a job fair – your two-minute commercial to potential employers	3.5
Professional dress	3.5
Assembling professional references	3.5
Interviewing skills, Types of interviews	3.4
Professional topics	3.4
Graduate School options	3.3
Mock Interviews	3.1
Business etiquette, multicultural experiences	3.1
Attending the Career Fair at Penn State Altoona	3.1
Professional correspondence – developing cover letters	3.0

Each activity earned an average rating between helpful and very helpful; all were received positively. When asked if they felt the class was useful, all eleven students responded affirmatively. All indicated that they would recommend the course to other students. Additional comments included:

- “It is a great opportunity to find jobs and learn about all the options available to EMET students.”
- “This class helps you a lot on making your resume and more or less forces you to go to the job fair.”
- “Just having our resumes ready to go was really helpful.”
- “I thought I was prepared for job searching but this class showed me that I had a lot to learn.”
- “The course can give you the confidence you need to tip the scales in your favor in almost any job searching situation.”

Tangible Results

Twelve students originally registered for the course in fall of 2006. One student who previously had no technical experience applied for and was offered part-time employment during the first few weeks of the semester. Since he began to work an extra 20 hours per week, he dropped the course in order to concentrate on the other required program courses, but only after explaining to the instructors that the discussion on resume creation had been invaluable, and that he was prompted to look for employment at this point largely because he felt his resume was incomplete without technical experience.

Of the eleven students who remained in the course, five graduated at the end of fall 2006, and six will graduate in spring 2007. Three of the five fall graduates had secured jobs by December, one as a result of the career fair at University Park, one as a result of the career fair in Altoona, and one through Career Services at Altoona. One of the fall graduates enrolled in a graduate program effective spring 2007, after being offered a graduate assistantship. The fifth fall graduate was still seeking employment as of December 2006, largely because he didn't do a lot of looking before graduation.

Of the six students who will graduate in spring 2007, one has already accepted a job offer from a company he made contact with at the career fair at University Park. As of December 2006, the remaining five continue to interview with prospective employers.

Future plans

The course is being offered to juniors in the spring 2007 semester, in order to engage them even earlier in the process of locating internships as well as permanent employment.

One question on the final course survey in fall 2006 asked for input as to what, if anything, should change if the course was offered to junior level students. Students suggested focusing more on internships, as well as additional information about job opportunities, interview preparation, and career planning. One student's comment was, "I think it would be perfect to have this during the junior year. I think I would have gotten more out of fall career days as a senior if it wasn't the first career fair I was ever at."

Observations/Challenges

Offering a course of this type to Engineering Technology students offers some unique challenges. These students are most comfortable and often most successful in technical courses. When they are challenged to participate in a course that deals more with non-technical, career-oriented topics, some naturally resist simply because they aren't as comfortable with the format. As engineers, they relate better to the precise sciences, not to the softer skills addressed in this course. We're asking students to face many of the activities that they are least comfortable with – marketing themselves, networking with employers at career fairs, and interview situations. This will always be an uphill battle. The mature student knows he/she cannot put the job search off forever, but it is possible to put it off far longer than one should. Students who graduate in May and then start their job searches in the summer are at a distinct disadvantage due to the lack of recruiting and career fair support offered at this time of year. This course provides a method to gently and in a positive way force students to engage in the job search process earlier than they would ordinarily do so. Being registered for the course also guarantees that students will not abandon their job searches when they become busy with other assignments. As a result of the class, the students actively network and utilize appropriate job search tools to gain employment instead of passively posting resumes to the Internet and waiting for a job to fall in their laps.

Another challenge lies in the fact that many students believe they already know how to successfully perform most of the activities addressed in this course. They see these as common

sense activities, rather than activities that require training. After all, if they can solve complex differential equations, they should be able to research a company for an interview. Too often, the students interested in taking part in an optional course like this one are the ones who need it the least.

One direct result of the course is that faculty became a more integral part of the job search process, causing a marked increase in the amount of student contact related to job search issues. Students regularly stop by outside of class time to talk about their interviews, to report progress in contacting companies or researching graduate school options, or to request advice about how to handle a particular job search related issue.

An added bonus is that students are able to share their interviewing experiences and information about the types of companies they are gravitating towards with each other. The course acts like a springboard for their job searches and the meeting times almost set up a job search club dynamic to keep students motivated.

Relationships among the engineering faculty, students, and Career Services staff are stronger because of the course. The BSEMET Program Coordinator and Career Services Director work cooperatively on class activities as well as attracting companies to the Business and Engineering Career Fair. The Career Services Director was able to increase her knowledge of the BSEMET program by learning more about course projects and group activities to showcase on student resumes. The BSEMET Program Coordinator was able to gain a greater appreciation of the support offered through Career Services to better prepare students for the transition from college into the workplace. In addition, the students who took the course acted as mentors for other engineering students who hadn't taken the class.

But ultimately, the course is optional; therefore, we have no means to require it. Our students are very busy with other courses and activities. Many work at least one job in order to help finance their educations. Our biggest challenge is to motivate students to believe that participating in this course will help give them the skills to successfully identify and secure the employment situation that will provide both success and happiness in the future.

Appendix 1: Syllabus for EMET 497A Fall 2006

EMET 497A Engineering Business Skills Special Topics in Career Planning Fall 2006

Purpose of the class:

- Engage students in the job search process early in the senior year
- Educate students regarding career planning activities and resources available

Results of registering for the class:

- A polished resume, with input from both engineering faculty as well as career services staff
- A specialized networking opportunity for students registered for the class
- Clear understanding of all of the support services available to utilize in your job search
- Information on professional correspondence and the interview process
- Additional information on career goals, proper business etiquette, career fair preparation

Course Grades will be based on:

Attendance/Participation – throughout semester
Career Goals paragraph – in class in groups – completed during class 2
Research a company paragraph – completed outside of class after class 3
2 minute commercial simulation for career fair
Job Fair Attendance – University Park – September 28 (Thursday)
Job Fair reaction paper – University Park
Job Fair Attendance – Penn State Altoona – October 24 (Tuesday)
Job Fair reaction paper - Penn State Altoona
Resume
Cover letter tailored to a position description
Mock Interview
Professional Topic Summary
Survey/Evaluation

Class	Topic(s)	In class assignment	Out-of-class assignment
1 & 2	Introduction of Syllabus; My Career Planning Situation Questionnaire; Information for resume writing (course experiences, software/hardware experience); Companies who have hired BSEMET students; Consider a position description for a resume critique exercise; Review resume rubric; Search for an entry-level position description to use in creating a resume		Make an appointment for a one-on-one resume critique with Career Services during the week of September 5 – 12; Resume must be submitted for evaluation on Sept 14
3	Considering Career goals – for the next year, five years, longer; Discussion of job options – salaries, benefits, opportunities for advancement; Lifelong learning	Paragraph on career goals – accomplished in class in groups and shared	
4	Turn in rough draft of resume and polished resume; How to Work a Job Fair; Professional Dress; BSEMET Program Information; Assembling professional references; Your two-minute commercial to potential employers	Develop your two-minute commercial for potential employers – accomplished in class in groups	Research a company attending Fall Career Days at University Park and write a paragraph outlining your findings
5	Resumes returned with feedback; Interviewing skills, components of the interview; Types of interviews – phone, on site, second		
6	Professional Correspondence; Develop a cover letter for a position description; Professional Topics	Cover letter tailored to a particular position description in groups	Cover letter tailored to previous position description - individually
7	Job Search Strategies – Nittany Lion Recruiting, Networking		

8	No class so students can attend the Career Fair		Attend Fall Career Days at University Park; write a paper on your experience
9	Discuss Career Fair experience; Review rubric expectations for Mock Interviews; Schedule Mock Interviews		Write a one page paper outlining your professional topic
10	Professional Topics		
11	No class to accommodate Mock Interviews		Participate in a mock interview
12	No class to accommodate Mock Interviews		
13	Business Etiquette, Multicultural Experiences		
14	Graduate School Options		
15	No class so students can attend Penn State Altoona BSEMET Career Fair		Attend Penn State Altoona BSEMET Career Fair; write a paper on your experience
16	Survey/Evaluation of class – Career Planning Situation Questionnaire Discussion of BSEMET Career Fair	Survey/ evaluation of course	