2006-1467: OFFERING A BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY DEGREE PROGRAM ON ACCELERATED EIGHT-WEEK TERMS: EXPERIENCES, CHALLENGES, AND ADVANTAGES FOR STUDENTS

John Blake, Austin Peay State University

JOHN W. BLAKE is an Associate Professor of Engineering Technology at Austin Peay State University, Clarksville, TN. He served as the chair of the department from 1994 to 2005. He received his B.S., M.S., and Ph.D. in Mechanical Engineering from Northwestern University, and is a registered Professional Engineer in the State of Tennessee.

Offering a Bachelor of Science in Engineering Technology Degree Program on Accelerated Eight-Week Terms: Experiences, Challenges, and Advantages for Students

Abstract

A recent exchange on the Engineering Technology listserv discussed the possible use of terms shorter than the traditional sixteen week semester. The responses indicated a strong preference for the standard semester, and very little interest in attempting to offer Engineering Technology courses in shorter terms. The fact that the question came up, however, indicates some interest in, or pressure on, programs to offer courses in terms shorter than sixteen weeks.

Our department was moved to the university's satellite campus, which is on a military base and where the standard operating schedule is based on eight week accelerated terms. With this change, we had to adapt our program to eight-week terms. This paper describes the author's experience as the department chair with making this transition from sixteen-week semesters to eight-week terms. This paper will discuss the changes we were forced to make, advantages and disadvantages for students, and challenges as well as opportunities for faculty and department chairs in making this transition to shorter terms.

Introduction

Our engineering technology department evolved from earlier programs in industrial arts and then industrial technology. The program offers the Bachelor of Science degree in Engineering Technology with specialized concentrations in robotics, manufacturing, and electronics, as well as a general concentration. After the move to the satellite campus, a two year degree program in electronics technology was merged into the department as well. This is a small department with five full time faculty members and around 100 majors in the four year degree program.

Initially, the department was based on the main campus of the university, and occupied the old industrial arts building. This campus operates on traditional sixteen week semesters, and caters primarily to traditional students and others who can take courses during regular daytime hours. The department could easily draw on courses in other departments as major requirements. Some departments, including engineering technology, offered a few evening courses. However, the lack of consistent evening offerings of required courses outside the major limited the department's evening program.

The university also has a satellite campus on a nearby military base. This compliments the main campus by serving as the primary campus for nontraditional commuter students. The prime time for courses is in the evening. To meet military needs, the campus operates on accelerated eight-week terms.

The student population at the satellite campus has a higher number of nontraditional students. Many students are either active duty military or military retirees. Also, the campus attracts a large number of students, mostly nontraditional, from the community. Despite recent troop deployments, enrollment has stayed strong on this campus.

A new administration came to the university in the fall of 1994. In the fall of 1996, the department chair and then the faculty were informed that the administration had decided to relocate, or extend, the engineering technology department to the satellite campus. There were many reasons for this move, including a sense that the department would attract more students at the satellite campus. Low enrollments and graduation rates had been chronic problems, and the administration expected this move to improve this situation. The move was to be made as soon as acceptable buildings could be obtained and prepared for the department at the new location. The administration informed the students in the spring of 1997, and the department began to offer a few courses at the satellite campus to start attracting students.

The university has had a presence at this location since the 1970s. It offers a large range of university core courses at the first and second year level, primarily with faculty from the main campus. To meet the needs of the military education center, the university has special permission to offer some two year degree programs. At the time of the move, there was one other four year degree program at this site. Since that time, more four year degree programs have been added.

There would be two moves for the engineering technology department. The first would place the department in temporary locations. The post had recently built a new education center, and the second phase of the center was under construction. When the phase two building was completed, the Engineering Technology department would move again from the temporary locations into large new lab spaces in that building. While planning was underway for the first move to temporary locations, the department was also working with the architect for the phase two project to have the new labs tailored to our needs.

The department moved from the main campus in June of 1998. With the initial move, the department entered a transition period, with a gradual shift from offering sixteen week courses to attract students from the main campus to offering all courses on the standard eight week terms of the satellite campus. By the time the department moved into the new phase two building in June of 2000, all courses were being offered in eight weeks.

Eight-Week Terms

The pattern of eight-week terms had been long established on the satellite campus. Courses still counted for three semester credit hours. A full time load for a student on an eight week term ranges from two to three courses (6–9 cr hrs). This compares with a full time load of four to six courses (12-18 cr hrs) on a sixteen-week semester. For students, this means that they are juggling fewer subjects in a given term. Many students are retired from the military and are attending college on veterans benefits. To qualify for the full funding that these students are entitled to receive, they must be registered for a full time load.

There are four eight week terms each year. The contract year for faculty starts in July with the Fall I (July-Sept) term, which ends around Labor Day. Between each term, there is a break of around three weeks. The next term (Fall II) starts in October and ends in December. The two spring terms, Spring I (Jan-March) and Spring II (April-June) round out the year. With this

university, faculty are on nine month contracts. Most faculty contracts run July to March, and any teaching during Spring II is the equivalent of summer teaching for faculty on regular August-May contracts.

Classes meet two days a week for eight weeks. Each class session is scheduled for two and one half hours, which includes time for a short break. The peak time for classes is 4:45 – 7:15 PM, followed by the later evening timeslot of 7:30-10:00 PM. There are daytime class periods as well, with start times ranging from 8:30 AM until 2:00 PM. Since many satellite campus students have daytime jobs or commitments in the military, the daytime sections are less popular. Most students want to be full time. If they are taking two courses, they prefer to schedule these courses on the same nights, either Monday and Wednesday or Tuesday and Thursday. This is a major issue with students using veteran's benefits.

Matching the Engineering Technology Degree Program to the New Campus

To operate successfully on the satellite campus, it soon became apparent that the department must match its curriculum and its pattern of operation to the new location. In short order, the department shifted from the daytime to offering most courses in the evenings. While some courses were initially offered in sixteen weeks to cater to students from the main campus, soon the department switched to offering all courses in eight week terms.

When the department moved to the satellite campus, many courses were structured as four credit hour courses, with part of this time for lecture and part for lab. The lab hours required twice the contact time as the lecture section. To match the standard time periods at the satellite campus, we had to change from this format to aligning our courses on the standard three credit hour lecture period. While we retained our labs, we now do labs within this shorter period. This was a painful change, as it cut lab time. However, to be attractive to students at this campus, we had to match the standard time periods. For manufacturing and robotics, a new course was added in each area to give students more lab time.

In the electronics area, four-year program courses were revised to follow the pattern used in the two year program. Where a subject area was covered with one four credit hour course in a sixteen week semester, two three credit hour courses were set up as replacements. While this gives time to cover the full textbook in each of these areas, we can only require so many courses, and this leaves very little room for courses beyond the basics in this area. This option was not feasible for most courses.

Some of the department's major core courses were already listed as three credit hour lecture classes. While these did not have to be changed in structure, it was a challenge to get students through the material in eight weeks. While the classroom contact time is the same, the students have less time to spread out the learning of the material. In practice, it is useful to mark the length of the term in terms of the number of weekends when working students can be expected to complete their homework assignments. With only eight weeks, there are fewer weekends, more is expected on each weekend, and the student is in greater distress if they find that they need more help from the instructor before they can complete the assignment.

The department had to change some course requirements outside of the major. When located on the main campus, our students took calculus and physics courses that were required not only for engineering technology majors but also of math, physics, and other majors. Enrollment from engineering technology students alone did not have to be enough to justify the entire course. The department's requirements in these areas had been pegged at the engineering school level. The calculus courses are each five credit hour courses, and our students had difficulty with these classes when offered over a sixteen-week semester. Even if we could fill the class, these courses would not be feasible during an eight-week term. We also changed our requirements from the calculus based to the trigonometry based physics sequence. While these are still five credit hour courses, this change did give the students some relief in terms of the required material. Also, the trigonometry based physics course is required for other majors, and does attract significant enrollment outside of our department at the satellite campus.

Course Scheduling

With a small department, many courses are only offered once per year. Generally, first and second year courses are offered at least twice per year. However, required major core courses and concentration courses are only offered once each year.

There is less flexibility for course scheduling when operating on eight week terms. To stay within the peak class periods at the satellite campus, classes are restricted to four time periods. Even for a small program, it is challenging to schedule the necessary number of classes without having time conflicts. To ease the pressure on time conflicts, the department developed a program of offering courses asynchronously by video. This can allow a student to take two courses that are scheduled at the same time by taking one of the classes by video. As with other distance learning and asynchronous options, this is not the best way to take a course. However, this is better than having to wait until the course appears again, and has been vital in allowing some students to graduate in a timely manner.

At first, the department attempted to run roughly one third of the courses in the daytime. As we moved to a pool of students who worked during the daytime, the department has largely dropped daytime offerings on the satellite campus. It would be desirable to have more day courses. This is where we have room to do more, and would attract students who work second shift. However, to do this, we need to have enough students who can attend in the daytime. One option under consideration is to recruit a daytime cohort from people working second shift in local industries, and schedule courses in the daytime as needed to meet their needs.

With the move, all faculty members were changed to the July-March contracts that are standard on the satellite campus. This resulted in many courses being offered in the three terms where faculty were under contract, and a very limited number of courses being offered in the Spring II term where faculty receive summer pay. To better balance the offering of courses, two faculty members were selected and moved to October-June contracts. With this change, there are fewer courses in the Fall I (July-Sept) term and more courses in the Spring II (April-June). This gives students a better selection of courses in all terms, and better balances our teaching loads.

Advantages and Challenges for Students

The shift to the satellite campus has given a new pool of prospective students access to the degree program. When the department was based on the main campus, most courses were in the daytime, and both military personnel and civilians who work during the daytime found it at best difficult to take courses. While the shift to the evening has greatly limited options for students working second shift, it has been very positive for people working the day shift and for people working at or near the satellite campus.

The shift has, however, deterred some students from the main campus from pursuing the program. It takes around thirty minutes to travel between the campuses. The university did attempt at first to offer a shuttle bus service. This did not attract many riders, the service was cancelled, and students in the major must have cars. With the announcement of the pending move in 1997, many first and second year students from the main campus changed majors or transferred to another university. This led to some years where we had very few graduates. Since the move took place, we have had some success in attracting students from the main campus to the degree program. We offer some of the first and second year level courses on the main campus. These courses are offered in sixteen weeks, and can be taken by new and undecided students early in their time at the university. Some of these students become interested in the program, and will come to the satellite campus to complete the degree. As a general rule, students can spend their first and second years based primarily on the main campus. After that, they must shift to the satellite campus and schedule.

Some of the students who take our introductory courses on the main campus do not stay with us, but choose to transfer to an engineering degree program. There is still benefit to the department, as these students do take courses from us and boost our enrollments.

With the eight-week terms, students do not need to divide their attention between as many different courses and subjects. On an eight-week term, a full time student will take two or three classes, compared to four to six classes during a sixteen-week semester. However, this ability to concentrate on a smaller number of courses is balanced against the demands of mastering the material in eight, instead of sixteen, weeks. For classes where the primary work outside of class is reading, this may even be an advantage. For homework-intensive classes where students learn primarily from solving problems, there is less time for homework. This is observed to be a problem in courses such as thermodynamics, where problem solving is key to learning the material.

For the students who can attend the evening courses and can keep up with the pace of the material, there are some advantages. Any student who needs to work while attending school can work during the daytime hours. Students who are seeking internships or other part time work in industry do not have to arrange their work schedules around their classes.

A student who is already employed only has to commit to a class for eight-weeks. If the student's employer needs to send them away on business and they must miss a term, they can limit this to one eight-week term, instead of missing an entire sixteen-week semester. However, if a student must miss time during an eight-week term, the student will miss more classroom time

for a given period than they would miss in a sixteen week semester, and will have less time to catch up on the material. The asynchronous videotape option comes in very handy here, as the student who must miss a class or classes can be given a video of the time missed.

There are some challenges for students. Each class runs for two and one half hours. This is a long time to be in the classroom, even if some of the time is spent on project or lab work. To balance their coursework with their home lives, most students attempt to take two classes on the same night, which has the student spending five hours in class two nights a week. Students also have relatively few weekends available for completing class assignments. If a student attempts the assignment and finds that they need more help before they can proceed, they have very limited opportunities to recover from this setback.

While there are challenges, many students have been successful in completing the degree program on the eight week semesters. The department's graduation rate has increased following the move to the satellite campus to where we are graduating 12-14 students each year. Anecdotal evidence from students indicates that many do like the eight week terms, especially nontraditional students with full time employment.

Advantages and Challenges for Faculty

The move to the satellite campus meant that the faculty members would be required to teach more night courses. Also, while the department has become part of the close-knit group of faculty at the satellite campus, they are relatively isolated from colleagues on the main campus. Resources such as the library are no longer a short walk across campus.

Class sessions are longer. This can be an additional strain on faculty, especially when a faculty member is developing a new course. The longer class sessions have their advantages. After one adapts to having a group together for a full two and a half hours, having to stop the class after fifty minutes seems very short, and one realizes how much time is required to review at the next fifty minute class. The longer class periods can be put to good use, especially if one mixes time for problem solving or lab work by the students with presentation of material by the instructor. As noted earlier, the transition caused us to reduce the scheduled number of lab hours. This is a drawback, and could only be partially allayed by restructuring or adding additional courses. The longer class sessions do help with this, as there is more time in a class meeting to mix presentation and laboratory work.

While one still has the same number of hours to present material, the greater challenge is to help the students learn the material in the shorter time frame of eight weeks. This is perhaps the greatest challenge. There is only limited room to spread material out by adding more courses. One possibility is to offer two courses as partners, where half of each courses is offered in each of two consecutive eight week terms. The students will have completed half of each course by the end of the first eight week term, and will complete the rest of the course in the second eight weeks. This would give the students sixteen weeks to master the material in both courses, instead of eight weeks for each course. However, for this to be practical, the group of students must need both courses and must be able to take courses in the two terms. Due to this limitation, we have not attempted this option.

Another area of challenge is ABET accreditation. When the decision to move the program was announced, the department was preparing to pursue initial ABET accreditation of the manufacturing concentration. With the demands of the move, plans to pursue accreditation had to be put on hold. The program was developed following ABET guidelines, and the pre-TC2K guidelines were used in the initial revision of the curriculum. With completion of the move and a semblance of stability restored, the department is working again to prepare for initial accreditation, this time under the new requirements. While this is in progress, it is anticipated that challenges inherent in the eight week terms will be evident in program assessment, and may lead to restructuring of the courses and curriculum.

Conclusions

Despite the challenges, the department has successfully made the transition to offering a bachelor of science in engineering technology degree program using eight week accelerated terms. Students are successful in completing the program and in finding and keeping employment, both while seeking the degree and after graduation. Our graduation rate has increased following the move, and the shift to an evening schedule on accelerated terms has helped nontraditional students with full time employment.

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