1989

UA66/9 The Birth of Engineering Technology

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WKU Engineering

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The
Birth
of
ENGINEERING TECHNOLOGY
at
WESTERN KENTUCKY UNIVERSITY

By

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What is Engineering Technology?

Engineering Technology (ET) is "that part of the technological fields which requires the application of scientific and engineering knowledge and methods, combined with technical skills, to support engineering activities". It is positioned in the technical occupation spectrum between the craftsman and the engineer, but more nearly adjacent to the engineer. This definition was developed by and has been used by the national accrediting agency for ET since accrediting began in the 1960s. It has always been used by the WKU-ET Department in the Western catalog.

Actually, a close cousin of today's ET Program, has been in existence in the United States since the early part of the 20th century. From those days until the early 1960s it existed in 2-year, Associate Degree Programs in institutions known as Mechanics Institutes. Those programs originated in and were found mostly in the northern, industrial states. However, after World War II, new programs began to appear in colleges in other parts of the country to help accommodate the huge influx of military veterans who were looking for short, intensified, technical degree programs that would prepare them for good paying jobs in industry as Engineering Technicians. The programs, though short in length, were highly math-science based and emphasized the application of engineering fundamentals and basics. When the Russians put "Sputnik" into orbit in 1957, the U.S. Government realized that something had to be done to catch up because our space program, up to that time, had been a disaster. American Engineering and Science Educators, with National Science Foundation support, got the call from Congress to begin doing something about the problem. Over a period of a few years, Engineering curricula changed from the "Art of Engineering" to the "Science of Engineering". Practical, skill-oriented courses in engineering were pushed out of the curriculum and replaced by more mathematics, science, and engineering theory. Some institutions tried to expand the engineering curriculum to 5 years, but enrollments plunged, so that experiment failed. Since the engineering curriculum appeared destined to stay at 4 years, then entered Engineering Technology, BS Programs.

Four year colleges that had started offering Associate Degree Programs in ET soon after W.W.II, now saw the need and opportunity to expand them to 4-year, Bachelor of Science or Bachelor of Technology Programs. The American Society for Engineering Education (ASEE) had recognized the Associate Degree programs and soon did the same for the BS and/or BT Programs. The Engineers Council for Professional Development (ECPD) was the accrediting body for Engineering curricula, so they developed criteria for accrediting ET curricula at both the AS and BS levels. By the mid-1970s, AS-ET & BS-ET Programs were so prevalent that ECPD changed their name to the Accreditation Board for Engineering & Technology (ABET) and reorganized themselves to serve both areas more efficiently.

A book entitled "Engineering Technology- AN ASEE HISTORY" was published in 1995 by GLENCOE/McGraw-Hill. It tells the complete story and includes some of the occurrences that are mentioned later in this report.
What about Engineering Technology at Western?

In 1963 I was an Assistant Professor of Engineering Mechanics & Graphics at the Virginia Military Institute (VMI) in Lexington, Virginia. I had a BS Degree from Western, Class of 1950, in Industrial Arts. In the spring of 1953 I was contacted, in Leitchfield, Ky. where my wife and I were teachers, by one of my Western classmates, Frank Hartis. He was an Engineering Drawing Instructor at VMI. He was anticipating an open faculty position there within a couple of years for an individual with my qualifications. Would I be interested? I said I most likely would be. He said he'd keep in touch. (VMI believed that individuals with Industrial Arts Degrees were the best prepared to teach Engineering Drawing to their Engineering Majors).

That summer, we were contacted by the Western Placement Office and told of a dual opening for my wife and me in Covington, Virginia. We investigated it and since it was near VMI, we decided to take the positions and moved there in mid-August of 1953. No more than a week after moving I was contacted again by Frank Hartis with the news that the position he had anticipated to be a couple of years away, was now open. We visited Lexington and investigated the situation with interest. Since we had already obligated ourselves for that year, we told Frank we would have to honor our contract and he agreed. He said they would try to work out a temporary arrangement for that year and maybe I could come in 1954. As it turned out, they were able to do that, so I joined the VMI Faculty as an Instructor of Engineering Drawing & Descriptive Geometry in September, 1954.

VMI had a policy that faculty members could take courses there if it didn't interfere with their teaching schedule and they had the support of their Department Head. During the period 1955-59 I completed 60 semester hours of credit in mathematics, chemistry, and civil engineering coursework. In 1959 I applied for and was granted a VMI Faculty Fellowship to pursue graduate study in Civil Engineering at the University of Virginia. I completed the MCE degree in 1961 and returned to the VMI Faculty as an Assistant Professor of Engineering Mechanics & Graphics.

I had been active in the ASEE since 1956 and had closely followed the happenings in engineering education. I worked for the Virginia Department of Highways as a Design Engineer during the summers of 1955-59. I could see that my engineering interests were much closer to the practice of engineering than to the research and development side for which the BS-Engineering degrees seemed more aligned. Even though I was teaching regular engineering students, I was gradually becoming more and more sympathetic toward the AS-ET and BS-ET Programs and that philosophy.

During all of this time I kept in touch with Western by subscribing to the College Heights Herald. In fact, in 1962 I employed a young graduate from Western, Charles William Watson, to teach with me at VMI. I had taught him in high school in Leitchfield and he was an excellent Instructor for us.
As I followed in the Herald what Western was doing, in 1964 I decided to feel out Prof. Walter Nalbach, then Head of Industrial Arts (IA), and see if his plans included anything that I might be interested in getting involved with. I felt that Engineering Technology was an area that Western should have some interest in and his department might be the place to start. He was very gracious, yet frank about the fact that Engineering Technology was not in their plans. Instead he asked me to consider joining the IA Department. However, my interest was in Engineering. There was no way that I could fit into Industrial Arts again.

In the winter of 1965, I made numerous contacts with colleges with open faculty positions of interest. I was offered a position at three different institutions. However, apparently Mr. Nalbach back at Western, had mentioned my name to the Dean of the Faculty, Dr. Raymond Cravens, so he called me one night at home. He had me discuss with him what my interests were and how I felt that Western could get an ET program started. We talked for two or more hours. He asked if I would consider taking a teaching position in the Mathematics Department while I planned and got an ET program started. He told me what the salary would be. All I could do was tell him that I would think about it and get back to him.

On April 21, 1965 I wrote Dean Cravens and told him that I had other offers that were better and that I would not be able to accept his offer, the salary was too low. Within a few days he called to say that he felt they could do better; would I consider a visit to Western and we could talk more about it? I agreed to visit and did in early May. I was impressed with what was going on at Western and what the possibilities were. He raised his offer to an acceptable figure, plus, added a paying assignment for the 1965 summer months. I soon accepted, resigned my tenured position at VMI, and moved my family to Bowling Green in late June. My summer assignment was with the Physical Plant Operations where I was put in charge of moving the library from the old building (presently Gordon Wilson Hall) into the new one, the former college gymnasium, which was renamed Margie Helm Library. While we were having our house built, my family and I occupied an apartment in West Hall on campus.

During the next two years I taught a full load in the Math Department and developed the plans for beginning Associate Degree level ET Programs in CET, EET, and MET. I was also the Faculty Advisor for Pre-Engineering Students. In fact, I developed and taught courses like Plane Surveying, Engineering Geometry & Graphics, Statics, Dynamics and Engineering Profession to those students, some of whom later became ET majors. Those courses were the foundation of the AS-ET curricula to come.

During the summer I sought advice and consultation from Dr. George McNelly, Dean of the School of Technology at Purdue University, Prof. Walter Thomas, Head of Mechanical Engineering Technology at Purdue, and the Director of the Ohio College of Applied Science at Cincinnati to develop the AS-ET curricula, compile equipment lists, etc. I also conducted surveys with industry to determine the need and justification for what we wanted to do. Dean Cravens assisted with that development by designating a part of a Title II Government Grant Program,
approximately $65,000, for purchase of laboratory equipment and provided additional funds for me to travel to visit those individuals named above. Western was divided into Colleges and we were assigned to the Ogden College of Science & Technology. Dr. Marvin Russell was appointed Dean of the College. He had spent many years in industry and was fully supportive of the developing ET Programs.

Initially, Associate Degree Programs in Civil(CET), Electrical(EET) and Mechanical(MET) were planned. They were approved and officially offered for the first time in the fall of 1968 with 20 declared majors(some students had known what was coming and had completed at least a year of the coursework already). Prof. Edward Flowers, a 1952 Western Physics Alumus, was employed to teach EET halftime serve as a Technician for the developing Mass Communications Labs. I was named the Interim Director of the Engineering Technology Programs. Dr. Marvin Bond(CET), Mr. Thomas Perkins(ME) and Mr. Albert Douglas Sanders(ME) were the added to the faculty.

During that academic year we took advantage of an ASEE “Visiting Engineer” Program that fall. The “Visiting Engineer” selected was the nations most renowned expert in the field, Dr. George McNelly, the Dean of the School of Technology at Purdue University. He spent 2 days with us reviewing, evaluating and advising. His parting advice was this:

In light of the fact that Western is a multi-purpose institution with multi-purpose facilities, that students expect baccalaureate degrees from such institutions, and that what you have already put in place is of high quality, you should expand your AS-ET Program as soon as possible to the Baccalaureate level, keeping the Associate Degree for students who find it necessary, for whatever reason, to drop out after two years. If you do that, there will be little or apprehension by parents about letting their youngsters pursue the program. That has been our experience at Purdue and it will be yours.

This advice was acted upon almost immediately and it was approved, on paper, during that same academic year. At the end of that first year (summere of 1969), we had two transfer students complete the program, one in CET and one in EET. That was the beginning.

The Exciting 1970s!

In the fall of 1969 and the fall of 1970, several faculty members were added including Dr. Donald Rowe(CET), William A. Beard(MET), and John Wright(MET). We were also fortunate to employ some excellent part-time faculty from local industry. They added that valuable dimension of “current application” and real-world problems to their courses that really did fit the ET philosophy.

In 1971 we asked ECPD to do a preliminary visit and evaluate the programs as if we were going for accreditation. They sent a team and did as we had requested. Their report spelled out
exactly what we needed to do to qualify for accreditation. Our number one need was an adequate facility. Since the College Training School had ceased operation, it was scheduled to be renovated and assigned to Engineering Technology and the Dept. of Geography & Geology. When that was completed, it was named Science & Technology Hall. In the meantime, I was appointed Acting Department Head.

During the period from 1970-72, another curriculum was developed. Both Drs. Bond and Rowe were civil engineers, but also held PhD. degrees in Environmental Engineering. Environmental technology was beginning to be a hot topic in those days, so we simply changed the CET curriculum enough that it could be Environmental ET. That required adding a strong chemistry/biology base and developing some very specific environmental courses such as water and wastewater treatment, air pollution control, hydrology, industrial and solid waste treatment, industrial hygiene, and radiological health.

Also during that period the Kentucky Department of Transportation (KYDOT) notified us that they would like to expand their scholarship program to include our CET students. They had supported a scholarship program with the University of Kentucky’s Civil Engineering students since 1948. We accepted the offer and began the program in the fall of 1971 with 5 scholarships. The program worked well, was expanded each year and by the time that I retired in 1989, there had been well over 100 BS-CET graduates who had benefited from KYDOT scholarships and were later employed by the KYDOT.

We relocated into Science & Technology Hall in the summer of 1972. The following spring, ECPD returned to do a real evaluate of the programs for accreditation. All programs were granted accreditation for a 4-year period. Even though Env.ET had yet to have a graduate, it was accredited based on the quality of the curriculum, the faculty, the facilities, and the interviews with students who were about to complete the program. It was the first curriculum of its kind to achieve accreditation in the U.S.

In the fall of 1973, we hosted a conference for Engineering Technology Administrators from institutions in the region. It was the third such conference to be conducted for the purpose of sharing ideas, voicing problems, and sharing problem solutions, developing a comradery with colleagues, etc. Our conference was attended by 25 representatives from 16 different institutions. It was so enthusiastically received that the following year it was opened up to a national audience at Indiana State University-Evansville and over 80 attended. The name of Engineering Technology Leadership Institute (ETLI) was adopted, an Executive Council elected, annual conferences planned, and the ASEE eventually adopted the organization and it still exists to this day as a sub-division of ASEE.

By the mid-70s an interesting development was unfolding for many WKU-ET graduates. As BS-ET programs grew in number and quality, the question of professional engineering licensing became an issue in most states. Since each state has its own licensing law, many laws
were stated in such a way that a BS-Engineering Degree was not explicitly required to sit for the licensing exams. That was the case in Kentucky, so many of our BS-ET chose to try it. All of the first 32 graduates who took the Engineer-in-Training (EIT) exam passed it. That record was not to be sustained, but most of those to follow were also passing it. However, the Kentucky General Assembly followed the recommendation of the National Society of Professional Engineers (NSPE) by passing a technology degree prohibition law to become effective in 1983. That stopped BS-ET graduates from any school in the country from qualifying for a PE license in Kentucky. However, many other states like Georgia, Pennsylvania, California, Indiana, and 35 others never enacted a prohibition law, so our graduates were welcome there. Except for California and Pennsylvania, most states have a different “experience” requirement for BS-ET graduates than BSE graduates, the rational being that the “practice of engineering” is learned on the job, not in the classroom.

During the 70s more faculty were added including Ronald Nichols (CET), Arthur Joe Bush (CET), Henry Healey (MET), John Carr (EET), William Moore (EET), Robert Baxter (EET), Laverne “Hank” Hardy (EET), and Dr. John Russell, (EnvET). Also during the 1970s enrollment and numbers of graduates grew steadily. By 1980, the number of degrees being granted each year had reached nearly 70. Many graduates were accepted into Engineering graduate programs at some very well known universities like Purdue, Vanderbilt, Notre Dame, Cincinnati, Texas @ Austin, New Mexico State, Oklahoma State, Montana State, and Virginia Tech. The former Dean of the University of Kentucky’s College of Engineering, Robert M. Drake, Jr., wrote the following statement to WKU President, Dr. Donald Zacharias, dated March 13, 1985:

“I have admired the four year technology program at WKU and Boyce Tates’ efforts over the years to bring the program to its present level. I really believe it to be an engineering program, the equal of some other programs now accredited as engineering programs, and that presents something of a problem for a state that is struggling with the burden of too many professional schools.

In any event the four year technology programs are an accepted part of the science-engineering-technology spectrum in the nation, and WKU has a good one”.

Unanticipated, Unplanned changes!

In 1981 an institutional budgetary crisis caused President Zacharias to move the Department of Industrial Education and Technology into the Ogden College of Science, Technology & Health (OCSTH) and merge it with the Engineering Technology Department. Since I had knowledge and experience in both areas, I was appointed head of the new department and it was named Industrial & Engineering Technology. Between 1981 and 89, there were some very positive things that occurred.

(1) I insisted, with a great deal of opposition from IT faculty, that the Industrial Technology curriculum be upgraded and that accreditation by the National Association for Industrial Technology (NAIT) be attained. To qualify it required a wholesale overhaul of the curriculum. The faculty finally cooperated, the curriculum was upgraded and evaluated by a NAIT Team, and accreditation was granted. Note: ABET did not then and still does
not accredit Industrial Technology Programs.

(2) In February of 1986 I was asked to be a member of a team from the University of Kentucky (UK) to go to Indonesia to evaluate the curriculum of the 3-year Polytechnic Institutes that the Indonesian Government had put in place some 5-6 years earlier. Over 100 of their best graduates had been selected to pursue baccalaureate degrees in the United States, where upon graduation, they would return to be Instructors in the Indonesian Polytechnics. Their curricula had to meet the proper criteria for prerequisites to be accepted in the US institutions that could provide that training. We found their curricula to be very strong and even more intense than their Associate Degree counterparts in the US. In the summer of 1987 approximately 120 Indonesian students were sent to UK for 8 weeks of intense instruction in English. When completed in August, the group was divided into three groups and sent to Western, Southern College of Technology in Georgia and Oklahoma State University. Our group numbered 56. Two years later they were all granted their various BS-ET degrees and returned home to teach.

(3) Desktop, personal computers (PCs) came on strong during the 80s. By 1988 the Department had developed and equipped a very up-to-date CAD lab. It serviced not only our Tech majors, but many individuals in local business and industry took advantage of evening classes and seminars.

(4) The ETech programs were evaluated by ABET again in ‘77, ‘82 and ‘86. Continued accreditation was granted each time, but each time there were suggestions for improvements that had to be made and a follow-up report sent a year later to certify that the items had been done.

There were two negatives that occurred during the 80s. One was that the OCSTH Dean, Dr. William Lloyd, decided that the BS-EnvET program should be phased out because of low enrollment and filling an open faculty position for that area could not be justified. I strongly opposed that decision and it has been proved over and over again since then that I was correct. Our plan to save the program was not given an opportunity. The Env.ET program produced some of our most productive and impressive graduates. Between 1975 and 85 it was a feeder to the Vanderbilt University Environmental Engineering graduate program in Water Resources Engineering.

The other negative was that I failed to integrate the ET and IT groups. The potential was so great for us to develop a true Polytechnic Department and maybe later, even a School of Technology. But, I could not find a way to get them to mesh, appreciate each other’s strengths, and work together to provide a truly broad opportunity for the students we could attract. Consequently, when I retired, the department was split back into two departments again. All that I could feel good about was that I for upgrading the IT curriculum and we were successful at gaining nationally accreditation.

During my tenure, Western employed 23 faculty members under my direction. All but two of those were Licensed, Professional Engineers. One who was not held the PhD. in Engineering and the other a
PhD. in Education. Dr. John Russell, now the ET Department Head, and Professors Kavey Khatir(MET) and Gregory Mills(CET) are still at Western in the ET Department.

**Conclusion**

When I entered Western in the fall of 1947 with a year of college at UK and 18 months in the WWII occupational forces behind me, I had not yet decided what I wanted to do for my life’s work. A friend had told me about the Industrial Arts program at Western and about some of the types of things you learn about there. I always liked to make things, had already had a year of college drafting, and my specialized training in the US Army was in surveying. My interests were in technical areas, but I had never even given one thought to being a teacher.

By the end of the fall quarter (Western was on quarters then) I had passed all my courses, enjoyed them all, fallen in love with a grade school acquaintance who was at Western majoring in music. We married before the winter quarter began and continued school together. From then on, Western was our school. Professors L.T Smith, Walter Nalbach, Carl Barnes and H.B. Clark managed to do what it took to make a teacher out of me. Then in Cherry Hall, Professor Russell Miller in Speech, Professor Sandifer in Physics, Professor Cockrill in Geology, Miss Richards and Miss Stith in English, Mrs. Simmons in Economics, and Ivan Wilson and Ruth Hines Temple in Art and others all contributed to my preparation for life. The sophistication of President Garrett, the calmness of Coach Jack Clayton, the crazy antics of Coach Diddle and the weekly Assembly Programs in VanMeter Auditorium all had an effect on my values. However, the size of the student body (approx. 1500) inspired a school spirit in all of us that still lingers. We knew many students by name and all by sight.

After I graduated and as I have built upon my Western experience, I have come to realize that those folks listed above deserve the credit for giving me the foundation I needed. That is why I was, and still am, so very honored to have been able to make the contribution to Western that I did. Thousands of students have benefitted to date from their Engineering Technology degrees. It is my hope that they will rally behind this new Engineering Degree effort and lend the support to it that only they can give. Western is their Alma Mater. Engineering is their profession. Both deserve their all!

As I close this report, I would be remiss if I didn’t name my Western colleagues who were my main encouragers and staunch supporters in developing the ET Programs. Besides Dr. Raymond Cravens and Dr. Marvin Russell, I had tremendous support from Dr. Dero Downing, Dr. William Strobe, Dr. Paul Cook, Dr. Charles Kupchella, Mr. Lynn Greeley, Mr. H.B. Clark, Mr. Owen Lawson, Mr. William Courtenay, Mr. John Smith, and of course, my tremendous ET Faculty who must be given most of the credit for the programs success. All of these individuals are either retired or passed away. Since that is the case, I feel honored to have been given the opportunity to tell this story the way it actually happened and to have it put on record in Western Archives. It is my desire that all future Western Engineering and Engineering Technology Students know the story of “The Birth of Engineering Technology at WKU”.

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