A HISTORY OF "ENGINEERING"

at

YOUNGSTOWN STATE UNIVERSITY

SECOND EDITION

FRANK A. D'ISA

and

DANIEL H. SUCHORA

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Youngstown State University

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This book is available electronically from the YSU Maag Library Archives. It was not formally published by any outside agency. It has been available since June of 2008. The book contains 186 pages and can be obtained at the site shown below at no cost.

http://hdl.handle.net/1989/3431

The history of your engineering college is outlined from its early beginnings in 1888 in downtown Youngstown with the offering of the first ever course offered by the school which eventually became YSU. By the way, that first course was in mechanical drawing designed for those trying to get prepared for work in the booming Youngstown Steel Industry. This book traces the history from those early beginnings to today and the formation of the STEM College. Of particular interest is a listing of every engineering graduate in the history of YSU, along with the names and years of service for all engineering faculty and engineering support personnel.

Frank D'Isa has been involved with YSU since the late 1930's first as a student graduating in 1943, then as a faculty member beginning in 1947 and as the Chair of the Mechanical Engineering Department from 1956 till his retirement in 1992. He obtained his MS in Mechanical Engineering in 1947 from Carnegie Institute of Technology and his PhD in Mechanical Engineering in 1960 from the University of Pittsburgh. Frank is a registered Professional Engineer.

Daniel Suchora began at YSU as a student in 1963 and graduated with his Bachelor of Engineering degree in 1968 and his MS in Engineering in 1970. He obtained his PhD in Mechanical Engineering from Case Western Reserve University in 1973. He began as a faculty member at YSU in 1975 and has been the Chair of the Mechanical and Industrial Engineering Department since 2005. Dan is a register Professional Engineer.

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PREFACE

First Edition

In May of 1977, the Department of History asked to interview me for the Youngstown State University Project on the History of Youngstown University. Pleased to comply, my unrehearsed responses to various leading questions were recorded on audio tape during an otherwise routine day at my office. Some weeks later, I received a typewritten transcription of the tape to review. The message held together well, but several folksy sounding passages needed clarification. The manuscript was edited and filed.

As years went by, I would occasionally read my copy of that interview. Each reading would jog the memory of additional information that might improve the contents. Eventually I began to entertain the notion of some day writing a history of the engineering school. On approaching retirement, and thereafter, I discussed the subject with my wife, and some of my colleagues. The reactions were mixed, but in general supportive and encouraging.

In December of l994, then a retiree, I was again interviewed, this time by Professor Hugh G. Earnhart, Department of History. Our unrehearsed discussion for the Oral History Program lasted about an hour and a half and was recorded on audio-visual tape at the University's Media Center. I welcomed the opportunity to participate in the ongoing effort to record the University's history, and was further inspired to proceed with my intended writing.

I had written much throughout my professional career. Some of my efforts had been published, including a textbook on my area of specialization, wherein there is a brief history. As a department chairperson I had maintained records and had prepared reports relating departmental activities. But somehow this venture seemed different, raising some questions in my mind. Is there some magical formula for writing a more extensive history? Are there potential problems of which I should be aware?

Most of my questions were answered in a very good book entitled “On Doing Local History: Reflections on What Local Historians Do, Why, and What It Means” by Carol Kammen, published by the American Association for State and Local History, Nashville, Tennessee, 1986. On page four of her book she states:

> “I see local history as the study of past events, or of people or groups, in a given geographical area --- a study based on a wide variety of documentary evidence and placed in a comparative context that should be both regional and national. Such study ought to be accomplished by a historian using methods appropriate to the topic under consideration, while following general rules of historical inquiry: open-mindedness, honesty, accountability, and accuracy.”

She goes on to discuss the multifaceted challenge of researching and writing a local history, and the pitfalls of bias and inadequate inquiry that plagued the work of many early historians. She relates the progress made since the 1880s with the emergence of “academic” historians and historical societies, and how local history is practiced around the world today.

Ms. Kammen does not tell her reader how to write a local history, but rather identifies and discusses expectations and problems of which one should be aware. Paraphrased, some of the more salient points are:

(1) The intent and scope of a local history should be clearly defined and adhered to. It should be much more than a chronological listing of dates and events. It should relate human experience in and through time.
(2) The historian should put aside any personal bias and tell the whole story, not only about successes and favorable episodes. Even though it can be expected that the historian and many of the intended readers have pride in their community, there is a risk of loss in credibility if the local history is too tidy or boosterish.
(3) Ethics are most important when writing. The historian must guard against injuring a reputation, or the use of misleading innuendos.
(4) Even if every bit of information about a local history is known, time and space may preclude that it can all be written. When necessary, choices should be in the interest of a well-balanced product that best accomplishes the purpose.
(5) As with all kinds of research reports, it is essential that proper credit be given to all references used for a local history. This gives credit to past historians, and may help other historians in the future.

After much thought, I modified my objective to be A History of "Engineering" at Youngstown State University, with the word "Engineering" used in a broad sense to include early non-degree programs, engineering, and engineering technology. The account would be related within the context of the history of the university, and of regional and national events and agencies that have affected "engineering" education. Hopefully, my memories from being on the scene for more than half of a century and a lot of research would produce something worthwhile.

It was quite a challenge to digest the enormous amount of information available in various references. The chronology of major events was easy to trace and the six chapter titles seemed to be appropriate. However, relating "human experience in and through time" required careful treatment. For this purpose, the annual college/university catalogs were especially useful. Each edition provides a snapshot of the institution at the time, but studied in sequence, the catalogs reveal changes that were in progress. I was particularly sensitive to addressing an appropriate array of topics and to treating each topic objectively.

A major concern in writing this history was recognizing people. Those persons whose mention was deemed necessary to relating the history are included in the text. Thousands more, all important to the history, are recognized at the end of the work where faculty, staff, and graduates in the "engineering" experience are listed in Appendices D, E, and F, respectively. These lists were assembled with great care using data from several sources. Still, the reader is cautioned to not consider the information to be an official release from Youngstown State University. Discrepancies should be reported to the William Rayen College of Engineering and Technology so that files may be corrected for future publications.

The author wishes to acknowledge with gratitude the tremendous support received for this project. University service areas that provided generous assistance include the Office of Human Resources, the Office of Institutional Research and Assessment, the Office of Student Registration and Records, the Office of University Relations, the William F. Maag Jr. Library, the Computer Center, the Media Center, and the Alumni Office. The Arms Museum of the Mahoning Valley Historical Society was likewise very helpful. I am also grateful to several colleagues that I interviewed.

The dean, faculty, staff, and students of the William Rayen College of Engineering and Technology were most encouraging and supportive, particularly with regard to printing the manuscript.

A special note of thanks goes to my wife Mary Kay, my sister Mrs. Virginia Davidson, and to Mrs. Ann Przelomski, retired Managing Editor of The Vindicator. Their helpful suggestions and time spent reading the manuscript were invaluable.

F. A. D'Isa

February, 1996

PREFACE

Second Edition

I have known Frank D'Isa as a teacher, a faculty colleague, my Department Chair, and my long-time friend. I first met Frank as the teacher of a class I took as a freshman mechanical engineering student in 1964; that class was Descriptive Geometry, a class in visualization of complex 3D geometry. I was fortunate to have Frank as the instructor in other classes, but those that made the greatest impression on me were the stress analysis classes. In all these classes, Frank was an outstanding teacher, with both a practical and theoretical excellence. More importantly, he was a role model of a professional engineer, being a true gentleman of highest integrity, with a great sense of humor. It is no coincidence that my area of interest in engineering practice and my teaching specialty is stress analysis.

Frank approached me for help with the first edition of this book, primarily to help produce a Word document of the text, rather than simply a typed manuscript. In the early to mid-1990's, that was a big deal. In the process, we had long discussions of the history of both YSU and Engineering at YSU. It is an interesting history and what is most obvious is the leadership, commitment, and personal sacrifice of the founders of YSU, especially in Engineering. These pioneers made it possible for people of modest means to obtain a high quality education that would probably not be possible without YSU.

When the first edition of this book was completed, Frank could not get any funding for publication from YSU. So, as usual, Frank paid for 200 copies of the text himself, and gave them to me to distribute as I saw fit. All he asked was that the proceeds from the sale of the book go to the Engineering College. All sales monies received have been given to the Engineering Dean's Gift Account to support the College. This is Frank D'Isa, a man of great generosity and dedication to YSU, especially in Engineering.

The second edition of this text brings the history of Engineering at YSU up to the time of the Engineering College's transformation into a part of the College of Science, Technology, Engineering, and Mathematics (STEM). Engineering has always been built on a firm foundation of science and mathematics. This new phase of Engineering at YSU brings forth both questions and opportunity. All hope for a continuation of what engineering has been, since its beginnings at the YMCA in downtown Youngstown in 1888, with the first recorded offering of YSU as a Mechanical Drawing Course. YSU gave the people of the Mahoning Valley an opportunity for a high quality engineering education at an affordable cost. Both Frank and I got our start in Engineering here, like so many others. This edition is dedicated to the hope that the future will always provide that opportunity to all of those who seek it.

A special note of thanks to Ms. Maureen Brajer, my very capable Administrative Assistant, for overseeing the editing and proofing of the second edition and Ms. Tara Anderson, who did much of the computer compilation.

Daniel H. Suchora

February, 2008

CHAPTER I

FROM YOUNG TO YOCO

Before l900

Prior to l791, a section of northeast Ohio was claimed by the State of Connecticut. When the area was ceded to the Federal Government, ownership of public land known as the Western Reserve was retained by the Connecticut Land Company, divided into townships, and sold to land speculators. Youngstown, Ohio was founded by a New York speculator, John Young, in l797. He laid out a town plat and divided it into building lots, completed the land sales, and returned east with his family.

Small pockets of iron ore had been discovered, and the first blast furnace was constructed along Yellow Creek near Struthers in l803. Wood, limestone and coal were available. Thus, what would become one of the great steel-producing centers of the world was born. Located midway between Cleveland and Pittsburgh on a river, the Mahoning, that provided access to the Ohio River and Lake Erie, the area would flourish as canals, and later railroads, would provide transportation for importing iron ore and exporting products. For the next 85 to 90 years the major industries would be the manufacturing of iron and the mining of coal; steel manufacturing by the Bessemer and Open Hearth methods would begin in the l890s. The mills would be built along the Mahoning River with the residential district developing to the north; the city would spread across the river to the south early in the twentieth century. Youngstown would be incorporated as a village in l850, as a city (population of 5,000) in l867, and become the Mahoning County Seat in l876.

The population of Youngstown grew to l,025 by l820, to 4,500 by l860, to 15,435 by l880, to 44,885 by l900, to 79,066 by l910, to 132,358 by l920, to a peak of over 170,000 before people started to move to surrounding suburbs in the l930s and l940s. By the middle l960s, the population of the metropolitan area (including Warren, Ohio) would exceed 500,000.

Prior to the l880s, most immigrants in America had come from northwestern Europe. With the exception of some South Irish and Germans, they were mostly English-speaking Protestants. After the Civil War, immigrants came in increasing numbers from Central Europe and the Mediterranean area. This brought Greek, Italian, Slovak, Polish and a multitude of other nationalities to the Valley. Churches for Roman Catholic, Orthodox, Jewish and many other religions were built. Immigration from overseas was curtailed after World War I, but the Valley's population continued to increase due to the mass migration of southern African Americans into the northern cities, and later, in the l950s, of some Puerto Ricans.

Youngstown grew slowly at first, but by l875 there were churches, a public school system (including The Rayen School), railroad services, banks, newspapers, water works, a fire department, law enforcement, a library, an opera house, and various businesses. The successful iron industry had produced a wealthy class of citizens, many of whom financed the cultural life of the city. A small group of business men sought to provide more opportunities for the young men to succeed, and so started a YMCA in 1868. Rooms were rented on the second floor of the Packard Building on West Federal Street where a free reading room was featured. It was quite fitting. The original Young Men's Christian Association was founded in London, in 1844, by George Williams. As an evangelical organization with the purpose of looking after the spiritual welfare of young men in the cities, the YMCA was growing rapidly in the United States, Canada and many other countries.

The local YMCA venture did not fare well, however, until the prominent leaders in the community became interested in l882. The revised organization, which included members of the first group, established its headquarters on the second floor above Ward's Gun Shop on East Federal Street and its activity rooms on the third floor of the building known as the Bushnell Block at 127 West Federal Street, which for many years housed Lustig's Shoe Store. Any young man who was a member in good standing of an Evangelical Protestant church could become an active member. Young men of good moral character, regardless of religious belief, were offered associate membership with all privileges except voting and holding office.

The declared objective of the local YMCA was the spiritual, mental, social, and physical improvement of young men. The new reading room was stocked with 65 different newspapers and periodicals, which included most of the outstanding periodicals of the l880s. Also included in the reading room were games, writing materials, musical instruments, a directory of good boarding houses, and an employment directory. Activities included social and religious meetings, popular lectures and practical talks, and musical and literary entertainment.

In time, the Board of Trustees felt the need to offer classes for young men who had not taken, or could not take, advantage of the conventional schooling. Some of these men were either illiterate or poorly educated, and therefore in need of classes in elementary and secondary education. Other men were finding need for classes beyond high school in technology and business. Most were working during the day and could only attend classes in the evenings.

William H. Baldwin, a graduate of Geneva College, was the first chairman of the YMCA Board of Trustees and, upon completion of his term of office in l887, became Chairman of the Education Committee that started and supervised the night classes. In l890, The Vindicator (then The Youngstown Vindicator) reported that classes for Fall and Winter were: (1)*

> Arithmetic, Algebra, Bookkeeping, Civil Government, English (beginning, elementary, and advanced), Electricity, Free Hand Drawing, Mechanical Drawing, Mechanical Drawing (advanced), German, Orchestral Music, and Political Economy.

Some of these classes had been taught previously, but the first found to be recorded was Mechanical Drawing in l888.

The Youngstown YMCA was incorporated in l885 and a management structure was developed during the next few years. The first position was general secretary, and by l893, the staff included an assistant secretary, a railroad secretary, and a physical director. A medical director was added in l896. In l892, a building, designed in Romanesque Revival style, was erected on the northeast corner of Federal and Champion Streets to house the YMCA activities. This location (now the site of the office building known as City Centre One) was in the cultural and business center of the city, in close proximity to the Public Library (on the site now occupied by the Mahoning County Court House) and the Opera House (on the Public Square next door and to the west of the Mahoning National Bank Building).

The educational program grew in the l890s, both in scope and enrollment. The classes listed above were continued and a variety of others were considered. School terms were in session from September to December and from January to April, followed by commencement. The annual report for l895-96 cited a total of 150 students. Classes in "English for Foreign Born Residents" were established in l896. The program of lectures was also expanded, featuring authorities from out of town as well as local clergy and professional people. Events that touched on technology included lectures on topics such as steam boilers and engines, house lighting,

* The number in the parentheses refers to the list of Reference Notes, page 69.

warming and ventilating, industrial electricity, plumbing, water supply, sanitation, waste removal, and iron and steel chemistry. A class in Applied Mechanics was listed by l898.

Herbert E. Caskey, General Secretary of the Youngstown YMCA from l887 to l902, promoted the educational program vigorously, emphasizing that the classes would enable a young man to get a job, be promoted in his present one, or obtain a better one. The national secretary of the YMCA awarded certificates to local students who passed approved written examinations, certificates that were recognized by more than 60 colleges. Also, The Vindicator would always be supportive of the YMCA activities, as would the Youngstown Telegram before it was absorbed by The Vindicator in l936.

The educational program would expand and eventually gain regional acceptances, but the YMCA would be plagued with a problem of accreditation and its effect on students. When a young man successfully completed his educational objective, his potential for success also improved in the Valley where both he and the purpose of the classes were known. Perhaps he had completed the equivalent of high school or more to meet certain job requirements. If, however, he tried to relocate for a job or seek to enter college, then the credibility of his transcript would naturally become an issue. A certificate from the national YMCA, as mentioned above, might have been helpful to pave the way. But, as the educational program became academically stronger and more promising, it was not uncommon to find students continuing their education in Youngstown for a period of time before transferring to a college. The students would seek transfer credit, and because the North Central Association of Colleges and Secondary Schools refused to accept credits from a YMCA school, the local YMCA tried to get its credits accepted by colleges individually. The YMCA would struggle with this dilemma for many years, without success. But, let us continue.

l900 to l920: The Youngstown Association School

The Youngstown scene changed dramatically from l900 to l920. The population almost tripled, from 44,885 to 132,358, with new immigrants first settling in available areas near town and the mills, and then in the more remote areas, mainly south. World War I (from June 28, l914 to November 11, l9l9) brought prosperity to the nation, and to the Valley as well. Steel manufacturers merged into four major corporations: United States Steel, Republic Steel, Youngstown Sheet and Tube, and Sharon Steel. From l915 to l920, Youngstown's payrolls more than tripled, and the capital invested in the steel industries exceeded $400,000,000. Railroad lines and banks became fewer in number, but stronger, and various merchants expanded their operation. The horse and carriage gradually gave way to the emerging automobile and the means for interurban travel was improved, making the city more readily accessible by students living outside of the area. These conditions all had a positive effect. Business operations became more complicated, thus requiring highly trained personnel in law, finance, and commerce. More highly trained engineers were needed to handle advanced technology in the mills. Public school teachers needed to advance their education in order to keep abreast of their profession. Young people were finding it to their advantage financially to pursue their education in Youngstown, even if they had to commute from an outlying area.

The YMCA membership grew rapidly and its activities expanded, adding physical conditioning, debating clubs, literary societies, art exhibitions, and others. Class topics were added to meet growing needs in technology, business, government, and general education. There also was a great need for classes in Telegraphy and in English for Foreigners. (Telegraphy was necessary, both to operate the railroads and as the only means of quick long distance communication before the telephone.) Day classes were added in the summer of l905, and extended all year in l910. The YMCA staff was increased and a full-time Secretary of Education was appointed in l906.

By l914, the YMCA activities had outgrown the physical facilities, and a larger building was constructed one block north at Champion and East Commerce Streets, where it now stands. The new building opened in l915, and the old one was eventually torn down. During l914-l915, there were 350 men enrolled in 24 classes, with a total class enrollment of 516.

The physical facilities again became stretched to the limit, and in l920 a building was added on East Rayen Avenue behind the Public Library (built in l910), which is situated on the northeast corner of Wick and Rayen Avenues. This new one-story structure (50 feet by 116 feet) could accommodate 300 to 400 students. Initially it would house the Automobile School which was started in l914. Later it would accommodate trade school classes such as welding and machine shop, and some drawing classes. The Rayen Avenue building did not, however, solve the space problem. Thus, in September of the same year, the trustees converted 27 dormitory rooms in the downtown building, thereby increasing the school space by 30 percent.

The most important expansion of the YMCA activities during this period was the founding of the Law School. In l908, the first class, Commerce Law, was held, and by l910, a law program to train men to pass the Ohio bar examination was started. The Law School soon gained a reputation for its truly college level curriculum and the success of its graduates. The School was accredited by the Ohio Supreme Court in l917 and authorized by the Ohio Department of Education to confer the Bachelor of Science in Law degree in l920. In l932, the Law School was granted admission to the Ohio League of Law Schools. The year l908 was established as the founding date of the university.

In l916, the YMCA educational program was incorporated as a non-profit institution under Ohio law, and was named the Youngstown Association School, open to both men and women. During the Summer of l916, the Association School advertised in the Youngstown Telegram, listing course titles under five headings: Law, Business, Engineering, High School, and General. (2) Listed for Engineering were:

> Surveying, Geology, Spanish, French, German, Analytical Geometry, Mineralogy, Sanitary Science, Calculus, Mechanics, Physics, Chemistry, Mechanical Drawing, Architecture, Estimating, Street Lighting, Concrete, Electricity, Heat Treatment of Steel, Structural Iron, Bridge Building, Mill Design, History of Architecture, Applied Mathematics, Heating-Ventilating, Sheet Metal, Theory of Machinists, Theory of Plumbing, Mechanics of Architecture, Graphic Statics, Commercial Practice, and Chemistry of Pharmacy.

This impressive list of courses, all of which were considered to be of college level, is an example of the aggressive capabilities of W. H. Rowland, Secretary of Education from l910 to l916. However, subsequent reports suggest that comparatively few of the courses were offered at any one time, with Mechanical Drawing, Architectural Drawing, Metallurgy and Electricity mentioned most often. All of the students attended part-time, and all of the engineering instructors taught on a part-time basis, with several hired over the years to handle the big demand for drawing.

The list of courses advertised in the Youngstown Telegram in l916 under the heading Business was equally impressive, but was actually a combination of accounting and business administration courses, and secretarial studies. Demand for college level courses in business administration was developing rapidly.

Thus, by l920 the YMCA educational program included the Law School, courses in accounting and business administration, courses in engineering, secretarial studies, the Automobile School, the High School, the Elementary School, and classes in “English and

Citizenship for Coming Americans." Classes were being held during days and evenings, in the Fall, Spring and Summer. Enrollment figures were not given, but it was estimated that there were about 2,000 part-time students.

l921 to l930: The Youngstown Institute of Technology

In September of l921, the Board of Trustees changed the name of the school from Youngstown Association School to Youngstown Institute of Technology, which at the time was consistent with a national emphasis on technological education. In l923, the Bonnell mansion next door and to the north of the Public Library was leased and refurbished to provide classrooms and drawing rooms. The plan was to move the college level classes "up the hill," leaving Secretarial Studies, the High School, the Elementary School, and the "English and Citizenship" classes at the YMCA location downtown. (Secretarial Studies would be instituted at the main campus in l938 and be renamed Business Education in l940.)

Leonard Skeggs was the Secretary of Education from l919 to l923, and then he became General Secretary. Homer L. Nearpass took over the Education post and was named Director of the Youngstown Institute of Technology. Under their leadership the course of study in Commerce and Finance was started in l920, and was authorized by the State Department of Education to confer the Bachelor of Commercial Science degree in l924. In l932, the course of study would be renamed Business Administration, with a Bachelor of Arts degree (AB) conferred. In 1948, the School of Business Administration was established.

In l923, the engineering program was considered to be college level with classes in mechanical, civil, electrical and chemical engineering, but the demand was not enough to offer a degree.

The next big development was in the liberal arts curriculum, which grew out of the high school classes beginning in about l921. Unlike law, business, and engineering, qualified faculty for college level courses in liberal arts were not readily available in Youngstown. Arrangements were made to have full-time faculty from nearby established colleges commute by train to teach classes in the evening on a part-time basis. Participating colleges included Hiram, Thiel, Slippery Rock, Westminster, Beaver, Geneva, and the University of Pittsburgh. In l927, faculty (some of whom had taught here part time) were hired full time for day classes, and the Liberal Arts College was established. In l930, the State Board of Education authorized conferring the Bachelor of Arts degree (AB); the Bachelor of Science degree (BS) would be authorized in l937. In l940, the College of Arts and Sciences was established.

Thus, by l930, three college programs - law, business, and liberal arts - were authorized to confer degrees, but they were not accredited by the North Central Association of Colleges and Secondary Schools. Only the High School curriculum had been accredited by North Central, in l925. All was not lost, however, for as early as l923, Ohio State University, as well as Hiram, Thiel, and Geneva Colleges agreed to accept the Institute's credits for students wishing to transfer. But most graduate schools were reluctant to admit students with a degree from a program that was not accredited.

After only two years in the Bonnell mansion, more space was needed because enrollments had doubled. In l925, the John C. Wick mansion at Wick and Lincoln Avenues was purchased and, after suitable remodeling, the Bonnell activities were moved to the new property. But, in two years the Institute expanded again with the leasing of the Henry C. Wick mansion next door and to the north on Wick Avenue (now the site of the Maag Library), which would become the home of the school until the Fall of l931. These magnificent mansions, like others on Wick Avenue, had passed their prime and were showing signs of deterioration.

Bonnell Mansion

Engineering Drawing (1929-30)

In l929, the YMCA decided to conduct a development campaign to raise a million dollars to pay debts, build new buildings, and purchase equipment. The steel industries, business community, and individuals responded so quickly and so generously that campaign workers were not needed. The "kickoff" banquet became the victory banquet. The first building to be erected was the Main Building (the name was changed to Jones Hall in l966) on the former site of the John C. Wick mansion. The exterior is of Tudor Gothic design and constructed of Indiana limestone. The event had great significance in that the school would no longer be relocated and would have a base from which to expand. Some felt that the building might serve the needs of the school for many years to come. The cornerstone was laid in May l931, and classes started there the following September.

In the late l920s there was very little demand for engineering classes, and what little activity there was would be included in the School of Liberal Arts beginning in l930. While the YMCA administration never gave up hope for engineering, there are several probable reasons for the lack of progress. There had never been full-time faculty to provide leadership for engineering. Unsettled housing and a lack of funding available for expensive equipment had precluded laboratory development. Established engineering colleges nearby were serving the needs of students seeking an engineering degree, although at a higher cost. Also, the three degree-granting units and the many other activities at the Institute demanded so much attention that it just was not the time for engineering to blossom.

Jones Hall

In l931, the Board of Trustees changed the name of the school from Youngstown Institute of Technology to Youngstown College. The name had become widely used after the Liberal Arts College was formed in l927. Soon, the nickname "YOCO" became very popular.

Engineering Education and the Engineering Profession

Thus far, our history of "engineering" at Youngstown State University has been discussed in the context of the development of Youngstown and the YMCA educational program. It is also essential that we appreciate the purpose and development of national, state, and local organizations that support engineering education and the engineering profession. Because many such organizations were established early in the time frame of this history, it seems appropriate to discuss them now.

Feats of engineering have been traced back to about 4000 B.C.; the processes of education are much older. In ancient times, a structure would be built by trial and error, with perhaps little record of the thought processes left for future generations to study. As centuries passed, man gained more knowledge of science and technology, applications became more specialized, and the techniques of disseminating information on new findings improved. Today, young men and women who aspire to a career in engineering need training in a branch of engineering (or engineering technology) from an accredited college or university. Once on a job, much of their work is governed by established standards. Their conduct is regulated by a code of ethics and they are encouraged to join engineering societies and to gain professional registration.

Beginning with Harvard University in Cambridge, Massachusetts, the 10 oldest colleges and universities in the United States were established from l636 to l769. By l900 there were about 800 federal, state, private, and church-controlled institutions of higher learning that would become accredited by one or more national and regional accrediting agencies. Listed in Appendix A are some colleges and universities in Ohio, Pennsylvania, and West Virginia. A few of these institutions were mentioned earlier in this chapter, while others will be referred to later in the history.

Listed below with their founding dates, are the regional associations that accredit educational institutions: colleges, universities, technical institutes, service academies, and secondary (high) schools:

Association	Established
New England Association of Schools and Colleges, Inc.: Commission on Institutions of Higher Education	1885
Middle States Association of Colleges and Schools	1887
North Central Association of Colleges and Schools	1895
Southern Association of Colleges and Schools: Commission on Colleges	1895
The Northwest Association of Schools and Colleges	1917
Western Association of Schools and Colleges: Accrediting Commission for Senior Colleges and Universities	1924

These associations normally accredit an entire institution; units within an institution may seek (or require) accreditation by a national agency for their field.

There are more than 400 national, state, and local engineering societies in the United States. Most have common goals of disseminating information, of bringing engineers together to

exchange ideas, of enhancing the standing of engineers and the standards of engineering education, and of maintaining ethical practice guidelines for engineers and employers.

National engineering societies which are of interest to this local history are listed, with their founding dates, in Appendix B. Among those listed are 27 societies that constitute the Accreditation Board for Engineering and Technology, Inc. (ABET), which prior to l980 had been called the Engineering Council for Professional Development (ECPD). ECPD was established in l933 and began accrediting engineering programs (individually by branch of engineering) in l936. The accreditation process was extended to associate degree programs in engineering technology in 1946, and to the baccalaureate programs in 1967. The 62nd Annual ABET Report (September, 1994) reports 1,494 accredited engineering programs in a total of 311 institutions and a total of 770 accredited engineering technology programs in 239 institutions. (3) The reported total membership (including students) of the 27 ABET societies exceeds 1,200,000.

A larger group of more than 30 societies (many of them also part of ABET) comprise the American Association of Engineering Societies (AAES), formerly known as the Engineers Joint Council (EJC). AAES represents the engineering profession as a whole in matters of public policy. A component of AAES known as the Engineering Manpower Commission (EMC) conducts various surveys on the profession and provides testimony thereon.

Five of the national engineering societies are referred to as the Founder Societies, as follows: American Institute of Chemical Engineers; American Society of Civil Engineers; The Institute of Electrical and Electronics Engineers; American Society of Mechanical Engineers; and American Institute of Mining, Metallurgical and Petroleum Engineers. They formed United Trustees, Inc. in l904, and built the United Engineering Center on United Nations Plaza in Manhattan, NY. The 20-story building, completed in l961, contains a library and office space for more than 20 engineering societies.

The National Society of Professional Engineers (NSPE), established in l934, is made up of 50 state societies and four from the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. One of the state societies is the Ohio Society of Professional Engineers, which was established in l935. The primary purpose of NSPE is to promote the profession of engineering as a social and economical influence vital to the affairs of men and of women and of the United States, placing great emphasis on professional registration for engineers, engineering technologists, and surveyors. Each of the state and territorial societies has a registration board, and establishes its own regional and student chapters. The National Council of Examiners for Engineering and Surveying (NCEES), established in l920, consists of all members of the state and territorial professional registration boards, and seeks to improve registration laws and procedures.

Listed in Appendix C are local engineering groups (chapters, sections, etc.) which were established by various national and state societies. Student chapters will be introduced later in the writing.

Last, but certainly not least, are the honorary societies which acknowledge achievement in academics, research, and professional stature. Honorary engineering societies, and their founding date, are:

Name		Yr. Est.
Tau Beta Pi	- National engineering honorary society	l885
Sigma Xi	- Recognition of achievement in research	l886
Eta Kappa Nu	- National electrical engineering honorary society	l904
Pi Tau Sigma	- National mechanical engineering honorary society	l915

Chi Epsilon	- National civil engineering honorary society	l922
Alpha Pi Mu	- National industrial engineering honorary society	l949

The highest honor that an American engineer can receive is election to the National Academy of Engineering (NAE), which was established in l964 as the engineering equivalent of the National Academy of Science (NAS). NAE provides expert engineering knowledge and guidance for the government.

Every professional organization expects its membership to abide with a code of ethics, i.e., a basic set of rules to follow when providing service to the public and when interacting professionally with each other. About 25 of the national engineering societies have a common set of guidelines. But perhaps most important to engineers and surveyors in Ohio is the Code of Ethics for Engineers and Surveyors, Chapter 4733 of the Ohio Revised Code, which applies to holders of a license to practice in the State. A reader interested in the Code should see Exhibit I on page 70.

Acceptance for membership in a professional engineering society generally presumes a pledge of conduct. As one example, a statement which was adopted by the National Society of Professional Engineers in June 1954 reads as follows:

ENGINEERS' CREED

As a professional engineer, I dedicate my professional knowledge and skill to the advancement and betterment of human welfare.

I pledge: To give the utmost of performance;

To participate in none but honest enterprise;

To live and work according to the laws of man and the highest standards of professional conduct;

To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.

In humility and with need for divine guidance, I make this pledge.

CHAPTER II

YOUNGSTOWN COLLEGE BEFORE WORLD WAR II

Dr. Howard W. Jones Becomes President

The decade following the stock market crash that occurred on October 29, l929, was marked by a devastating depression and high unemployment, with industries and urban industrial workers hit the hardest. Congress passed the National Labor Relations Act in July, l935, authorizing employees to organize and bargain collectively through representatives of their own choosing. Still, conditions of the time reduced previously workable management and labor relations in the Valley to a state of adversity that prevailed into the l950s. Youngstown College was fortunate, however, in two respects. First, the generous contribution pledges resulting from the development campaign in l929 were honored in spite of the financial crisis. Second, the student enrollment was not affected as expected because the low tuition cost provided an opportunity for students who were financially unable to go away to college.

In July l931, Howard W. Jones, AB, M.A., became Assistant General Secretary of the YMCA and Head of All Educational Activities. Born in Palmyra, Ohio, on September 27, l895, Mr. Jones had served as assistant to the president at Hiram College. Homer L. Nearpass resigned in l931 and Leonard Skeggs died in l933, leaving the entire responsibility to Mr. Jones, who was named Director of Youngstown College in l932, and President in February l935. He was awarded a D.Ped. degree in l944 by Westminster College.

Beginning in l931, the YMCA educational program placed an increased emphasis on collegiate orientation. By the middle l930s the Elementary School, the High School, and the Trade School on Rayen Avenue were all closed. The estimated overall enrollment of about 2,000 students in l930 dropped to a reported 1,238 by l932. However, beginning in l930, Youngstown College reported enrollments only for the degree-granting units. Using the college catalogs as the reference, there were 528 students enrolled during the academic year l930-31 (280 men and 248 women; 268 day and 260 evening). The enrollment increased to 784 (439 day and 345 evening) in l934-35, and to a peak of l,743 (734 day and 1,009 evening) in l941-42 before declining to 1,175 (495 day and 680 evening) during l943-44, largely because of the draft for World War II. Thirty-two degrees were awarded in l931-32; the high until after the war was 124 in l942-43.

During the l930s, three academic areas gained attention: education, music, and engineering. Education and music are discussed briefly below (engineering is treated in more detail beginning on page 14).

In l932, the college started a high school teacher training program to fulfill a need of the Youngstown public schools. The Department of Education was established in l933 and authorized by the Ohio Department of Education in l937 to confer the Bachelor of Science in Education degree (BS in Ed.). Authorization to train elementary teachers was granted in l939.

The Music Department was started in l930 and by the late l930s, it was offering curricula for both the Bachelor of Arts degree (AB) and the Bachelor of Science degree (BS). In l941, the Music Department was merged with the Dana School of Music, which was started in Warren, Ohio, in the l870s and had gained national prestige. The Charles S. Thomas home on Wick Avenue, one block north of Jones Hall, was purchased to house the Dana School of Music of Youngstown College.

Except for the steel strike in l937, the pulse of the Valley was relatively stable during the latter l930s. There were signs of economic recovery, but still considerable unemployment.

However, the United States, the Valley, and of course Youngstown College would begin to feel a pulse increase in September, l939 when World War II broke out in Europe. At first Americans debated whether to take part or stay out of the conflict, but by September of l940 the United States Selective Service Act became law and all eligible men between the ages of 18 and 37 were required to register for the draft. The United States converted from peacetime to wartime manufacturing, aiding the Allies in every possible way short of war, while building up its own supply of war materials. Automobile factories made airplanes and tanks; the Valley turned out about 10 percent of the nation's total steel production. Mobilization and training of wartime personnel (men and women) for the various branches of the armed forces and for national defense was implemented in earnest. A few days after the Japanese attack on Pearl Harbor on December 7, l941, the United States was at war with Japan, Germany, and Italy.

Entrance of the United States into the conflict affected Youngstown College and the students in several ways. Summer vacation was eliminated so that students might complete the requirements for their degree sooner. Enrollments declined because of enlistments and the draft, and also because employment opportunities improved. In fact, because of a shortage of employees in industry, women were employed to do jobs normally performed by men.

A program that affected some of the male students directly was the Army Specialized Training Program (ASTP). It seems that the government sought to preserve the talent of the upper-division students in certain disciplines, notably pre-medical and engineering, but perhaps some others. However, parents of sons in the service were not delighted with any favoritism shown to college students. The ASTP provided a means by which students who enlisted in the program would be inducted into the service for basic training, and later attend a college elsewhere to complete their degree. Students who participated in ASTP were required to include some additional courses in their curriculum. Engineering students took four courses: Economics of War, Meteorology, Navigation, and Military Psychology.

Following commencement in June of 1943, the student body consisted almost entirely of women. Intercollegiate sports were suspended and would not be resumed until the Fall of l946. Necessary to the war effort, but still of concern to everyone, was the rationing of gasoline, shoes, nylons, cigarettes, coffee, sugar, and other food items.

To assist in the war effort (and to offset the revenue loss from student tuition) the College undertook government subsidized programs such as civilian pilot training, instruction on the manufacturing of munitions, specialized training essential to national defense, and the pre-induction naval training V-1 program.

North Central Accreditation

When Dr. Howard W. Jones became Assistant General Secretary in l931, a group among the YMCA Board of Trustees began to move toward making Youngstown College independent and accredited. The strongest support came from James L. Wick Jr., who had been serving as Chairman of the Education Committee (which functioned as the Board of Governors of the College) since the close of World War I. He was of the opinion that deficits in other YMCA activities were being made up from College surpluses, and the Board of Trustees would remind him that there had not been a charge for the use of the physical facilities and some other services.

Mr. Wick proposed that the College be incorporated and have a new Board of Governors which would replace the Education Committee and not be restricted to YMCA members, and thus not consist solely of Evangelical Protestants. The Board of Trustees approved the proposal, and 27 men (some of whom were Roman Catholic and Jewish) were appointed to serve on a temporary Board of Governors while incorporation procedures were undertaken. The Trustees,

however, refused to give control of the College finances to the new Board of which Mr. Wick was elected chairman.

Debates and arguments persisted over the next several years. Trustees who were faithful to the YMCA felt that they were straying too far from their original objective, and that no unit should be allowed to become more powerful than the YMCA. Others dwelled on the advantages of autonomy and accreditation for the College. The College Catalogs from l931-32 to l935-36 listed a Board of Trustees for the YMCA and a Board of Governors for the College, with only 10 to 12 names repeated. But in fact, the Board of Governors consisted largely of YMCA members.

Finally, Youngstown College was incorporated in March, l937. By the new regulations, the College gained more authority over academic activities and operations, and personnel. However, the YMCA retained control of the College finances and property. The number of members on the temporary Board of Governors had been increased to about 33, but the new regulations continued to require that it consist largely of YMCA members. Beginning with the College Catalog for l936-37, only a listing of the Board of Governors was shown. The North Central Association would not accept these conditions. However, once incorporated, the College did gain recognition from some other groups. They gained admission to the Ohio College Association in l940 and the Association of American Colleges in l941. The College would become a member of the American Council on Education in l946.

The report from North Central Association following its accreditation visit in l943 convinced a majority of the Trustees that the College had to become independent of the YMCA if it was to become accredited. North Central had found much to commend in the college, but also much to criticize. It was clear, however, that the critical issues were governance and finances. In spite of appearances, the YMCA was legally in control. Financial records of the College were found to be mingled with those of the YMCA in a confusing way, and the College had no assets except for current funds (tuition) and the equipment in the buildings.

In November, l943 the YMCA Trustees proposed three changes. Henceforth, only a majority of the College Governors would be members of the YMCA. The College records would be kept separate from those of the YMCA, and the College buildings and property would be turned over to the College corporation. These proposals were ratified at a full membership meeting of the YMCA, and subsequently by both Boards at a meeting on January 11, l944. The Articles of Incorporation were signed by Howard W. Jones, President, and Hugh H. Manchester, Secretary, and filed with the Secretary of the State of Ohio. Following another accreditation visit, Youngstown College was accredited by North Central Association of Colleges and Secondary Schools on April 7, l945. The College would continue to use the YMCA physical education facilities for many years and some of the faculty would maintain enrollment in their national pension fund. The clause regarding YMCA representation on the College Board of Governors (name changed to Board of Trustees in l944) would eventually be eliminated in l955. (Women utilized the YWCA physical facilities at 25 W. Rayen Avenue, built in l912.)

The local YMCA must be commended for first recognizing a need for classes to educate young men in the l880s and for its tenacity in developing the educational program. It had been vitally instrumental in developing an urban college, urban by definition in that the development was entwined with the development of the city. It is easy to understand the YMCA's reluctance to give up the College assets that they had acquired through contributions. (City tax revenues had not been, nor would ever be, used to support the YMCA educational program or the College.) However, it was inevitable that the College had to be given its independence if it was to become accredited, and the YMCA must again be commended for recognizing that granting such independence was the ultimate act of fulfilling its purpose of helping students. Henceforth, academic credits earned at Youngstown College would gain wide acceptance.

Engineering: AB & BS Degrees

Engineering programs emerged in the Liberal Arts College in the early l930s. This was made possible because programs in chemistry, mathematics, and physics were started in l930. Having major influence at the time were Castle W. Foard, Ph.D, Mathematics and Physics, and Eugene D. Scudder, Ph.D., Chemistry. (Dr. Scudder later served as Head of the Chemistry Department).

The College was on the semester system of terms (and would be until it became Youngstown State University). The Fall semester was in session from about September 15 until the end of January, with a two-week-long break at Christmas. The Spring semester lasted from about February 7 to the end of May with a one-week spring break. Summer sessions were nine weeks long, beginning about June 15. The reader is reminded that under the semester system, course numbers ranged from the 100s level for freshmen courses to the 400s level for senior courses.

In the college catalogs for l930-31 and l931-32, there was only one course entry listed under Engineering: Engr l0l, 102 - Principles of Engineering Drawing, Descriptive Geometry, with a note that students interested in pre-professional study should see the Director of the College before making out a schedule.

The first engineering curricula were listed in the l932-33 catalog: a "Pre-Engineering Three Year Plan," a "Four Year Engineering Course Leading to an AB Degree with a Major in Chemistry," and a "Four Year Engineering Course Leading to an AB Degree with a Major in Mathematics or Physics." The "Three-Year Plan" would enable the student to complete an engineering degree elsewhere in three years, a "Four-Year Course" in two years. The three year plan required a minimum of 96 semester-hours credit; a four year course required a minimum of 126 semester-hours. No degree was awarded to students who completed the three year plan.

From l930-31 to l936-37 the total number of courses listed in catalogs under Chemistry, Mathematics, and Physics increased from 22 to 49, but only a few that were introduced had titles that might be found in engineering curricula, as follows:

l931-32:	Chem 313	Metallurgy
	Chem 314	Metallography
l932-33:	Chem 316	Metallurgy
	Math 314	Analytical Mechanics (Statics and Dynamics)
	Phys 211, 212	Surveying
	Phys 303	Electricity and Magnetism
	Phys 305, 306	Electrical Measurements
	Phys 308	Thermodynamics

In l937, the Liberal Arts School was authorized to confer the Bachelor of Science degree, which was more fitting for engineering. The new authorization was reflected in the catalog for l937-38, showing programs as follows: "Curriculum for the Bachelor of Science Degree in Chemical Engineering" and "Curriculum for the Bachelor of Science Degree in Mechanical Engineering." The Chemical Engineering program had a General Option and a Metallurgical Option. A total of 150 semester-hours were required for the BS degree, which included 10 semester-hours of freshman mathematics below the level of calculus, and two years of a foreign language. The "Three-Year Plan" and the "Four-Year Courses" no longer appeared in the catalog beginning in 1937-38, and the curricula for the Bachelor of Science degree would be in effect until after the war. (The Department of Chemistry would continue to offer a curriculum leading to a Bachelor of Science degree with a major in metallurgy until 1970-71.)

From l936-37 to l942-43, the total number of courses listed in catalogs under Chemistry, Mathematics, and Physics increased from 49 to 90 and the number of courses with engineering-type titles increased from 10 to 31. The only courses listed under Engineering, all on engineering drawing, increased from two to five.

During this period of six years, the number of full-time faculty for chemistry, mathematics, and physics increased from three to six, but there had only been one full-time faculty member for engineering. Byron W. Mottinger, E.E., handled engineering courses from academic year l938-39 until his death during l941-42. He was considered by his students to be the director of their program. However, the college catalogs did not designate any title for Mr. Mottinger.

Over the same period of time, the number of part-time faculty increased from three (one for mathematics and two for engineering) to 13 (seven for chemistry and mathematics, and six for engineering). Most of the part-time faculty had professional work experience that enhanced their educational qualifications. The engineering students were particularly cognizant of the position and company affiliation of faculty who had experience in local industry.

In l938, the Henry K. Wick mansion, later known as East Hall, was purchased to house the Secretarial School. The purchase included the Wick family stable, which was remodeled to provide classrooms and laboratories for the Engineering Department and made available in the Fall of l941. This three-story structure was known as the Applied Science Building, but was often affectionately referred to as the Stable of Allied Science. In later years, the building would be known as West Hall. For a description of the laboratories in the Applied Science Building see Exhibit II, page 73.

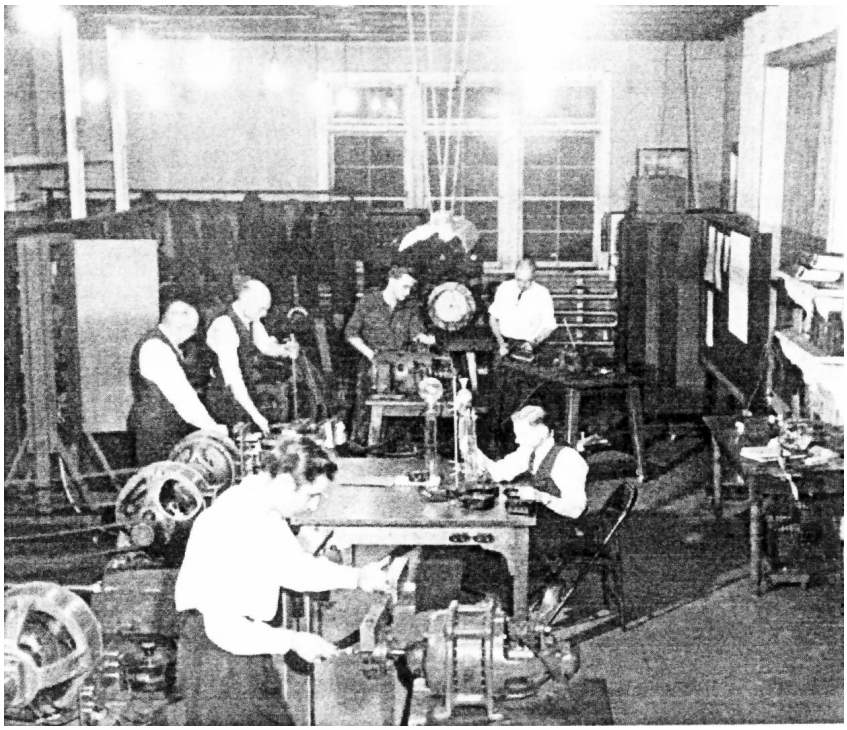
It was later reported that the Engineering School was inaugurated in l939 in a single room in the rear of the basement of the main building (Jones Hall). (4) Personal notes of the author place a laboratory in the basement in l940 for electrical engineering consisting of a motor-generator set, three transformers, and a few meters.

Louis A Deesz, BSE.E., E.E., joined Youngstown College as a part-time faculty member during the academic year l940-41 and became the first Dean of Engineering in l944. A native of Denver, Colorado, and a graduate of Carnegie Institute of Technology, Dean Deesz had acquired 25 years of engineering experience while working for several organizations, including Westinghouse Electric and Manufacturing Company, and Republic Steel Corporation.

Memoirs of A Student

As a student in high school during the later l930s, the author has several recollections. Certainly, the depressed economic condition had made everyone very money conscious. One problem was that many people were suffering financially from past periods of unemployment, and the future still appeared uncertain. Also, the hourly wages for many jobs was well under a dollar an hour, and if fully employed, it was not uncommon for a family of four to live on an annual income of about $1,500. Moreover, a new automobile cost $800 to $1,000, a house perhaps $3,000 to $5,000, a gallon of gas 10 cents, a loaf of bread 9 cents, and a gallon of milk 50 cents. It was estimated that the annual food bill for a family of four was $480. Thus, a college education for a son or daughter presented a real sacrifice, except perhaps for the more

Applied Science Building



Laboratory in the Applied Science Building

affluent families. Furthermore, scholarships and grants were rarely available. Consequently, young people felt little or no pressure either from society or their peers to go to college.

Many people felt certain that well-paying jobs would open up again soon and that gaining experience would be worth more than going to college. On the other hand, a college graduate carried a certain respectability, and there were stories about young people who had gone to college for just a year or two who had obtained good jobs. The high school counselor for engineering was most likely to be a mathematics or science teacher. At South High School, a mathematics teacher, Herman C. Welch, made a special effort to counsel students on science and engineering careers and also on the programs that were becoming available at Youngstown College where he taught evening classes. Trying to understand what the various branches of engineering entail was as much of a challenge for a high school student then as it is now. A visit to an industrial plant would reveal an awesome array of engineering applications in too short of a period of time, and the associated engineering offices would seem to consist of endless rows of drafting tables, leaving one to wonder where to start learning the operation.

All things considered, a commitment to complete the necessary high school prerequisites and seek a college education would, in most cases, reflect the personal desire of the student to go to college. Only about one percent of the national population was attending a college or university, and Youngstown College was accommodating about one percent of the local population --- largely due to a low cost of $240 per year, including tuition (for 16 semester-hour credits), fees, and textbooks. Local high schools would acknowledge college aspirants (about five percent of the class) at commencement, and the College registrar, Mr. Philip P. Buchanan, would follow up with a personal contact.

Students who attended Youngstown College in the late l930s and early l940s experienced conditions that were uniquely memorable. The main building (Jones Hall) was the center for most of the college activity, with all available space in use. On the first floor were the president's office, the registration office, the auditorium, The Jambar (started in l931) office, the publicity office, the payment office, the student lounge, the business office, the cafeteria, the book store, and offices for the Dean of the College and the Dean of Men. The second floor housed mainly classrooms and much of the third floor was used for biology, chemistry, and physics laboratories. The Music Department and the library occupied the fourth floor. The Dean of Women and some faculty had offices on the second and third floors. Religious counselors for students of Protestant, Catholic, and Jewish faiths were available. The College auditorium had a seating capacity of about 375 and served many functions: chapel services, dances, seminars, music performances, etc. (The auditorium capacity would be increased to 800 and named Strouss Auditorium when the north side of the building was remodeled in l949. The space is currently used as the records area.) The student lounge, where students studied, relaxed and socialized, was across the hall in the area later occupied by the Bursar's offices for many years. (This area has very recently been restored as a lounge).

As mentioned previously, the total enrollment in academic year l941-42 was 1,743, with 734 reported to be day students. However, the daily student traffic and the attendance at various student functions suggested that the number of students who participated in the life of the college on a full-time basis may have been about 300 to 350. The College fielded its first football team in the Fall of l938, and the first homecoming was held on November 12. In l939 a live mascot, Pete the Penguin, created much interest until he drowned while fishing under the ice at Crandall Park in January l941. His successor, Pete II, was also short lived, and so went the idea of a live mascot. As was the practice with basketball, which was started in l927, the home football games were held in local high school facilities (mostly South and Rayen). Fraternities and sororities were very much in evidence, and participated actively in such annual social functions as the Homecoming Dance, the Snowflake Frolic, the Sweetheart Dance on Valentine's Day, Sadie Hawkins Day, and the May Day Festival. The Newman Club was active.

A convenient alternative to the College cafeteria was the tea room in the basement of the Lincoln Hotel across the street on Lincoln Avenue at the site now occupied by the Warren P. Williamson College of Business. Also, there were at least 20 restaurants and lunch counters downtown to serve most tastes: the Mural Room, Raver's, the Brass Rail, Petrakos, the Italian, the Ringside, and Oles, to mention a few. Federal Street, from Spring Common at the west end to Watt Street at the east, and the adjacent grid of streets to the north and south were a beehive of activity. The Tod House and the Ohio Hotel provided fine lodging. Among the many vendors were G. M. McKelvey Company (later Higbee's), Strouss-Hirshberg (later Kaufmann's), Sears-Roebuck, Livingston's, Woolworth's, drug stores, and grocery markets. The pedestrian traffic was heavy, particularly on Saturdays.

There were 10 or more movie theaters including the Palace, Warner, Strand, and Paramount, most of which would open about noon and run continuously until almost midnight. For about 25 cents, one could enter any time a seat was available, see a double feature, a news reel and an animated cartoon --- and leave anytime. Such movie classics as "Gone with the Wind," "Casablanca" and "Wizard of Oz" were released during this period. Also, it was the height of the Big Band era and most of the famous orchestras came to the area, such as Glenn Miller, Benny Goodman, Tommy Dorsey, and Vaughn Monroe. Some bands appeared in concert at the Palace Theater, others for dancing at Idora Park, the Mansion, the Elms Ballroom, and Yankee Lake. Those who sought classical entertainment could attend the Music School performances, the Youngstown Playhouse (started in l925) and the concert series at Stambaugh Auditorium (built in l926). Both the Monday Musical Club and the Youngstown Symphony Society used the auditorium. There were also concert and opera performances as near as Pittsburgh and Cleveland. The Butler Institute of American Art (built in l9l9) and the College Art Department (started in l927) held frequent exhibitions, and there were numerous church festivals and many special events at Idora Park during the summer.

Many outlying areas of the city, some of which were ethnic, had a church, a clothing store or two, a restaurant, a grocery store, a gas station, a beer garden, and perhaps a neighborhood theater (or drive-in), but there were no plazas or malls. An automobile was a convenience, but many people managed very well without one. The bus transportation system had routes covering the entire city, picking up passengers at frequent intervals of time from 4 a.m. until almost 2 a.m. A weekly pass good for unlimited bus use cost one dollar. Ten bus tokens or 25 student tickets with no time limit for use also cost one dollar, and you could get a transfer coupon for travel across town. People needing to travel further could go by Greyhound bus or one of the four railroad lines: New York Central, Baltimore and Ohio, Pennsylvania, and Erie. Ticket fares were reasonable.

Beginning in the Spring of l942, it became increasingly more difficult for most students to concentrate on their class work. The plots of then recent movies, such as "Sergeant York" and "Yankee Doodle Dandy," and the lyrics of hit records played on wartime moods and situations. Scarcely a week passed without some classmates either leaving for the service or appearing for a visit while on furlough. Either way, a get-together would be generated at a moment's notice. An entourage would accompany departing classmates to a train station or the bus station to wish them farewell. Anxiety about the future had created a party-like atmosphere that was at times very understandably distracting to academic objectives. The College officials had a problem justifying or denying course credit for students who were inducted unexpectedly.

Several aspects of the educational experience of engineering students seeking the Bachelor of Science degree during this period are noteworthy. Freshman and sophomore class enrollments averaged about 25, but the upper-division classes were small, usually fewer than 10 students. There were only 35 engineering students. Overall, the quality of instruction was very good and the curriculum provided adequate laboratory work and a flavor of practical application where possible. However, the programs lacked both breadth and depth in engineering courses

during 1942-43 because the college did not hold several of the courses listed in the curriculum. Perhaps dwindling enrollment made such offerings impractical.

Applications of mathematics in the engineering courses presented only the usual difficulties, but without calculators and computers, numerical calculations were tedious. Until about l940 or l941, when the slide rule came into use by engineering students (at YOCO), calculations were made either longhand or by the use of logarithms. But, no matter what method one might choose, much time and care were required to minimize human error when numerical calculations were lengthy.

Written communication was also tedious. Because of a lack of quick convenient methods for duplicating written materials, there were few, if any, prepared handouts given in the classes. Thus, students had to rely heavily on taking notes. In many classes it was required that written assignments and laboratory reports be prepared either longhand in ink (ball-point pens did not become available until the late l940s) or by typewriter. Either way, errors could not be corrected easily, or neatly. With a typewriter, multiple copies could be made by using carbon and onion skin papers, but then errors would have to be corrected on each page. If a copy of an important document was required, a much used option was to obtain a photostatic copy, or a blueprint in the case of a drawing.

In summary, “engineering” at Youngstown College became increasingly visible beginning in 1932-33. The earliest curricula addressed pre-engineering study only, but by 1937-38, full courses of study were available for chemical and mechanical engineering. In the Fall of 1941, the Applied Science Building became the home of the Department of Engineering (minus laboratories for chemistry and metallurgy which were retained in Jones Hall). For the first time in history there were full-time engineering students on campus, few in number but notable at the time. (The author’s research uncovered 16 engineering students who earned the BS degree, seven of whom completed the requirements after World War II. Only one student could be found who earned the AB degree, this one prior to the war.) Following commencement in June of 1943, the college would assist the war effort and lay plans for the post war era.

CHAPTER III

YOUNGSTOWN COLLEGE AFTER WORLD WAR II

The Veterans Return

During World War II, the industrial capacity of the United States had expanded greatly to meet the military needs. Civilian unemployment virtually disappeared; money was earned, but there was a scarcity of domestic goods. Following the war, the industrial plants undertook a double task: satisfying the enormous backlog of demand for consumer items in this country, and providing materials necessary to rebuild industries in the war-torn countries of the world. There followed an affluent era of full employment and prosperity that would extend into the l970s.

Preparing in advance to assist veterans in readjusting to civilian life when the war was over, Congress passed the Servicemen's Readjustment Act (known as the GI Bill of Rights) in l944. One important provision of this Bill entitled every veteran to government support at an accredited educational institution for a period of time based on the length of his military service.

The conflict in Europe ended on May 7, 1945, and in the Pacific on September 2, 1945. Demobilization during 1945-46 brought about rapid increases in college enrollment under the GI Bill. It is estimated that 2,200,000 veterans took advantage of this opportunity to attend college, of which 450,000 sought engineering. This also served to inspire non-veterans and younger brothers and sisters to attend. The large influx of students into the nation's colleges and universities created much need for faculty and new facilities. Many new institutions were established.

The Korean conflict started on June 25, l950 and ended on July 27, l953. In l952, Congress passed the Veterans' Readjustment Act for Korean War veterans, which would add another 1,200,000 students to the higher education system.

As mentioned previously, the enrollment at Youngstown College was reported to be l,l75 in the catalog for l943-44. President Howard W. Jones reported an enrollment of 3,086 for the Fall of l947 and a peak enrollment of 4,359 in the Fall of l948, at which time 2,752 (63 percent) were World War II veterans. The ratio of men to women had changed dramatically from less than one to one to more than four to one.

There followed a decline in enrollment as the World War II veterans graduated and because of the draft for the Korean War. Also, the plentiful employment opportunities in the Valley caused some young people to defer their education or attend only part-time. By the Fall of l952 the enrollment dropped to 3,142 including 482 World War II veterans, but by then, 104 returning Korean War veterans had enrolled. By the Fall of l955 there were only a handful of veterans enrolled on the GI Bill, but the enrollment of Korean War veterans was 1,325, accounting for 29 percent of the total enrollment of 4,597.

The engineering enrollment increased from about 35 students before World War II to a reported 799 in the Fall of l948, but then dropped to 643 students by the Fall of l952, representing 20 percent of the total enrollment of 3,142. But, by the Fall of l955, when Youngstown College would become Youngstown University, the engineering school became the largest of all the academic divisions, claiming 1,209 (27 percent) of the total enrollment of 4,597.

When the North Central Association visited the College prior to granting accreditation in l945, the examiners expressed concern about the potential for campus expansion, which appeared to be limited, and the lack of an adequate library facility. With the large influx of veterans,

coping with these concerns took on a sense of urgency. Classroom facilities would have to be expanded quickly, utilizing available existing structures, some of which are discussed below. A new building could serve as a library, provide additional classrooms, and be an important step in future campus development.

Classroom space was added during l946 when four army barracks, each two stories high, were obtained from Camp Perry, Ohio, through a Federal Government program for the disposal of surplus war goods. These four barracks, known as the Annex, were interconnected and in a line parallel to Wick Avenue, beginning just north of West Hall. A fifth barrack was added in l947, which would house a cafeteria and dining area on the first floor, and music practice rooms on the second. Known as Central Hall, this barrack was situated between West Hall and East Hall.

Also in l946, the college bought some homes on Bryson Street for classroom space, and the Butler residence just south of the Butler Institute of American Art for use as a home for the president. (Bryson Street, now a campus walkway, was parallel to Wick Avenue and bordered the west side of the Science Building.) Occasionally, classes were held in the basement of the president's home, which eventually gave way to the Maag Library.

In l950, Pollock House, on the northeast corner of Wick Avenue and Spring Street, was given to the college by Mr. and Mrs. William B. Pollock II. The first floor was used for social events, and the upper two floors for classrooms and offices. The building was remodeled and enlarged in l987 and is currently the Wick-Pollock Inn.

Ford Hall, on the site which is now occupied by Bliss Hall, was a gift from Judge and Mrs. John W. Ford and Judge Ford's sister, Mrs. Benjamin Agler. The building provided classrooms and offices on the first and second floors.

The former Newsboy's Club on Lincoln Avenue (on the site of Ward Beecher Hall) was renovated and remodeled in l953 for use as the Women's Physical Education Building.

Continuous or occasional use was made of various other facilities belonging to such agencies as the City of Youngstown, the Mahoning Chapter of the American Red Cross, the Mahoning County Tuberculosis and Health Association, the Board of Park Commissioners of the Youngstown Township Park District, the Girard Board of Education, the Public Library of Youngstown and Mahoning County, the Butler Institute of American Art, Stambaugh Auditorium, St. John's Protestant Episcopal Church, St. Joseph Roman Catholic Church, and the First Presbyterian Church.

The critical need for a library building on campus was finally satisfied in l953. In 1892, the YMCA started with a reading room containing newspapers and periodicals, but after it began to hold classes, the school relied almost entirely on the Public Library for reference books, both when the library was downtown and later when it was moved to its present location. When the main building (Jones Hall) was constructed in l931, space on the fourth floor was reserved for a college library. In l935, it was reported that the library contained 4,387 volumes and 38 current periodicals, which were very small holdings when compared to 142,780 volumes at the Public Library.

In l938, the Association of the Friends of Youngstown College was organized by the American Association of University Women under the leadership of Mr. William F. Maag Jr., editor and publisher of The Youngstown Vindicator and a member of the College Board of Governors. Through their continued effort, the college libraries, which included the Main Building Library, the Rayen Building Library, the Music Library, and the Law Library, contained about 65,000 volumes and nearly 500 periodicals by l952. The holdings were still

small compared to 270,000 volumes and 575 periodical available at the Public Library, but the faculty was careful to select additions of particular value to the academic programs.

In l947, the Friends began a campaign with the goal of one million dollars for a new library building, and in l949, the lot for the building was purchased. With much credit given to President Jones for raising funds, the campaign goal was reached in June l950, and construction was started in the fall. Dr. Jones paid high tribute to industrial and business firms, and individuals throughout the Mahoning Valley for their contributions to the Library Fund, noting that many of their employees and children were taking advantage of the opportunities that the college presented. He also praised the Friends and Mr. Maag for their untiring support.

The three and one-half story library building was opened in May of l953. When the building was completed, however, space was provided in it not only for the library, but also for faculty offices, meeting rooms, registration of students, and other activities. A wing at the north end of the building consisting of nine classrooms and faculty offices was known as John Tod Hall. Today the entire building houses administrative offices and is known as Tod Hall.

In l955, 10 years after the initial accreditation, the college was reaccredited by North Central Association of Colleges and Secondary Schools. North Central felt that the institution met the qualifications of a university, having five accredited academic units: Law, Music, Arts and Sciences, Engineering, and Business. Effective September 1, l955, Youngstown College became Youngstown University.

The Dean Deesz Era

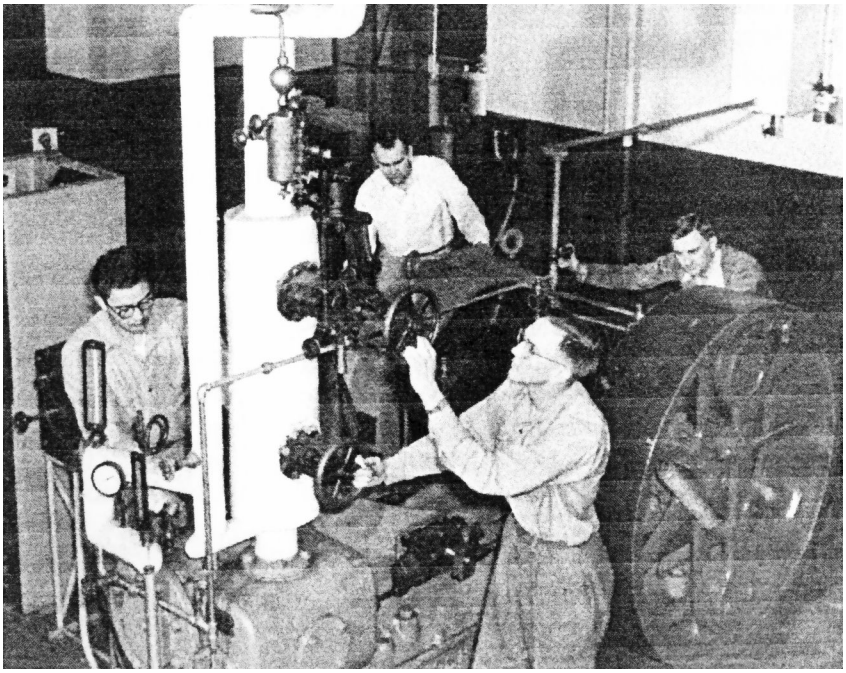
In l944, the College leased the Judge William Rayen Building on Wick Avenue just south of Rayen Avenue and arranged to have the interior completely rebuilt for use as an engineering school. Constructed in l866, the building was used for city high school classes until the current Rayen School was built in l922. It was a junior high school until l928, but from then until l944, the building was used infrequently. Beginning in February l946, the Judge William Rayen Building would house the William Rayen School of Engineering. At this time, the administration also elected to relocate the mathematics and physics classes from the main building (Jones Hall) to the William Rayen Building. (For a description of the interior of the building, see Exhibit III, page 74).

In October of l944, Youngstown College was authorized by the Ohio Department of Education to confer the Bachelor of Engineering degree (BE). Even before the new authorization, however, Dean Deesz made changes in the curricula for the Bachelor of Science degree. Listed in the college catalog for l944-45 and l945-46 (a single catalog) were curricula for electrical, industrial, and mechanical engineering. Notable changes within the curricula included the reduction of the foreign language requirement from two years to one, and the introduction of a three-semester-hour thesis credit requirement in electrical and mechanical engineering.

In the catalog for l946-47-48, curricula are listed for chemical, electrical, industrial, mechanical, and metallurgical engineering leading to the Bachelor of Engineering degree. The programs required a minimum of 150 semester-hours credit, including 10 semester-hours of freshman mathematics below the level of calculus. The foreign language requirement was eliminated. Only mechanical engineering required a three semester-hour thesis credit.

Of the five engineering curricula mentioned above, the one for chemical engineering was not included in the college catalog for l947-48. The other four engineering curricula required four credits of thesis. Finally, in the catalog for l948-49, there were established six curricula

Judge William Rayen Building



Laboratory in the William Rayen School of Engineering

leading to the Bachelor of Engineering degree, in chemical, civil, electrical, industrial, mechanical, and metallurgical engineering, with four credits of thesis required in all areas. Returning students who had earned significant credit toward the Bachelor of Science degree had the option of completing the curriculum that was in effect when they first enrolled in the College or switching to the curriculum for the Bachelor of Engineering degree.

It is interesting to note the listing of an elective course on the slide rule in the catalog for l948-49: Engr. 125 - Theory and Use of the Slide Rule - One hour credit. The slide rules had become much more sophisticated than were those of the early l940s. However, the course was only listed in the one catalog; faculty in the engineering school elected to include slide rule instruction in their coursework where appropriate. A few introductory lessons were also offered in the first engineering drawing course for several years. (A similar one credit-hour slide rule course was offered under Chemistry from l949-50 until l962-63.)

In the catalog for l949-50, a total of 71 courses were listed under Chemistry, Mathematics, and Physics, and 82 under Engineering. Excluding courses on engineering drawing, 24 of the courses listed under Engineering included laboratory work. We recall that in l942-43 there had been 90 courses listed under Chemistry, Mathematics, and Physics: 31 with engineering-type titles, including 18 with laboratory work. The only courses listed under Engineering at the time were five drawing courses. Thus, there had been considerable growth for engineering, both in the number of course offerings and in laboratory emphasis and usage.

A significant growth in faculty also occurred during the seven-year period from l942-43 to l949-50. The number of full-time faculty increased from six (all for chemistry, mathematics, and physics) to 20 (11 for chemistry, mathematics, and physics, and nine for engineering). Part-time faculty increased from 13 (seven for chemistry, mathematics, and physics, and six for engineering) to 26 (11 for chemistry, mathematics, and physics, and 15 for engineering).

Prior to World War II, when the full-time faculty numbered six or fewer, the instructors undoubtedly had to teach a wide range of course topics, some perhaps outside of their preferred specialty area, in order to make the curricula available to the students. By the late l940s, the number of full-time faculty was approaching 20; yet again teachers had to be flexible for quite a different reason. In l946-47, the veterans enrolled en masse, creating a large freshman class with much need for chemistry, engineering drawing, and freshman mathematics. The next year these students needed calculus, physics, and some sophomore engineering courses, but there was also another large freshman class to accommodate. During this period, the full-time engineering faculty taught mathematics and physics, as needed. As the initial influx of students became juniors and seniors, some of the full-time mathematics and physics faculty taught engineering courses. Dean Deesz had a difficult task: making the teaching assignments accommodate the needs of the students. It was not uncommon to add another class in a scheduled course or to respond to a petition from students to accommodate an unexpected need for an unscheduled course. As mentioned previously, the engineering enrollment increased from about 35 students before World War II to a reported 799 in the Fall of l948, after which the flow of students became more uniform with an enrollment gradually dropping to 643 by the Fall of l952. The faculty teaching loads were high, often exceeding 18 semester-hours, and the class enrollments very often reached the limit for the classrooms (35 to 40). Students expecting to complete their degree requirements in four years had to carry 18 or 19 semester-hours each semester if they did not intend to attend summer school. (Chemistry classes and many chemical engineering classes were taught at the main building.)

One question that is often asked is why the degree designation was changed from Bachelor of Science (BS) to Bachelor of Engineering (BE). The author does not know for certain, but believes that Dean Deesz wanted to tell Youngstown (and beyond) that the School of

Engineering was starting anew with the purpose of training engineers. Also, the Dean believed strongly that laboratory experience was vital to a good engineering education. He was proud of the existing laboratory equipment but realized that much work would be required to implement the equipment for class purposes. Also, many smaller items of equipment needed to be built, and funds were limited. Thus, he admittedly viewed the thesis as the means by which the faculty and students, working together, might accomplish the task. Again the author is not certain, but the Dean may have felt that requiring both a thesis and a foreign language might have discouraged students from attempting engineering. For whatever reason, dropping the foreign language requirement, emphasizing laboratory work, and adding thesis did give the engineering programs a new look. Moreover, the thesis proved to be very effective in the development of the laboratory courses over the next 10 to 15 years. Hundreds of theses (bound in black covers) are located within the department offices, with copies in Maag Library. Traces of equipment made by students as part of the undergraduate thesis can still be found in the engineering laboratories. The course description in the catalog for l949-50 reads:

> Engr. 401-402. THESIS – Before graduation the student must prepare a written report containing a minimum of 2,000 words. This report is to be an investigation on some subject either selected by the student or designated by the dean of engineering. Three bound copies will be required. Specifications will be presented to the student upon request. No credit will be given until the thesis is accepted by the dean and the department head. Prerequisite, senior standing.
>
> Two hours credit each semester.

Dean Deesz did not, however, leave laboratory development solely to theses. He constantly sought serviceable machinery from his many friends in industry, and on several occasions made arrangements to visit a government surplus depot in Columbus, Ohio. The Dean, Mr. P. Calvin Pickard (the College Business Manager), two or three faculty, and a small maintenance crew would meet at the school on a Saturday morning at about 4:30 a.m., and then drive to Columbus, arriving about the time the surplus depot opened. It was quite a challenge to hunt through many storage areas for items that could be adapted to the engineering school laboratories, or perhaps be useful for parts. The maintenance crew would load the truck for the trip back to Youngstown, arriving sometime after supper.

The first scholarships that specifically benefited engineering students were those established by Sharon Steel Corporation in 1945. Every year, four full-tuition four-year scholarships were awarded to sons and daughters of employees who were interested in the fields of engineering, metallurgy, or business administration.

The first award to recognize student achievement was established in l947 by the Mahoning Valley Chapter of the Ohio Society of Professional and Registered Engineers, Tri-County Section (Mahoning, Trumbull, and Columbiana Counties). Given annually, the award is based on personality and outstanding achievement over a four-year period. The award was initially called the “Engineers Award,” but later renamed the “Louis A. Deesz Memorial Award.”

In l948, Dean Deesz sought to establish a chapter of an honorary engineering society open to all branches of engineering. He contacted both Sigma Tau and Tau Beta Pi. Tau Beta Pi did not indicate an interest. Sigma Tau did, but explained that it was its policy not to initiate a new chapter until an institution could show successful operation of a local honorary society for a period of at least two years. After further discussion with the faculty it was decided that because the School of Engineering included also the mathematics and physics departments, then so should the local honorary society. The name Mu Pi Epsilon (Mu for Mathematics, Pi for Physics, and Epsilon for Engineering) was coined and the first student organization at the William Rayen School of Engineering was established during academic year l948-49. The local society became

the Alpha Theta Chapter of Sigma Tau in l955. However, Tau Beta Pi absorbed Sigma Tau in l974, and the local group became the Ohio Lambda Chapter of Tau Beta Pi.

In l949, the American Society of Mechanical Engineers, Youngstown Section, established an award in Mechanical Engineering, granted annually to the outstanding graduate. In l951, the annual Henrik Ovesen Awards to mechanical engineering graduates with second and third ranking were added.

Two student organizations of interest to engineering students were started in l949. The Youngstown College Chapter of the American Chemical Society, Student Affiliates, was established for students interested in any phase of chemistry. The Youngstown College Chapter of the American Society for Metals, Student Affiliates, became available to students interested in the manufacture and treatment of metals. As with all organizations on campus, the university name in titles has been updated to Youngstown State University.

Early in the Summer of l949, Dean Deesz announced to his faculty that it was time to show the engineering school to the public and that he had targeted November 16 and 17 as the dates for an open house. The faculty and students were very supportive. Every effort was made to highlight each laboratory. Motors, engines, duct work, etc., received a fresh coat of light grey paint. Pipes and conduits were painted various colors for identification: red for steam, green for water, yellow for electricity, etc. Many placards were printed (freehand) to identify laboratories, equipment, demonstrations, etc. Handouts were prepared and a routing plan through the building was established. The Youngstown Vindicator provided excellent publicity prior to the event and devoted the front page of their Rotogravure (sepia color) Section on Sunday, November 20, to pictures of the Dean, faculty, and students in the laboratories. (5) Finally, the time for the open house arrived, and the turnout on both days was very gratifying. Represented were the trustees and administration, local industries, city officials, parents and students, faculty, other areas of the College, the general public, local high schools, and various other groups. The first open house of the William Rayen School of Engineering was declared a huge success.

With the engineering school facilities progressing well and a healthy student enrollment, Dean Deesz conferred with the Dean of Engineering at Ohio State University regarding the future of the school. Soon after their meeting, the Dean urged his faculty to increase their effort to document course syllabi in order to ensure uniformity of instruction among full-time and part-time faculty. No other call for faculty action resulted from the meeting, but perhaps he was giving serious thought to accreditation.

On April l9, l950, Youngstown was shocked to learn of the sudden death of Dean Louis A. Deesz. At the time of his death, he was preparing to testify on the proposed Mahoning-Grand floodway before the Army Engineers board at Gravelly Point, Virginia, near Washington, D.C. Locally Dean Deesz had been chairman of the engineering committee of the Mahoning Valley Industrial Council. The Dean would be missed by everyone, but his school would go on.

ECPD Accreditation

By the end of April, l950, President Howard W. Jones appointed Frank M. Ellis, BS, M.Ed., leader of the physics faculty, to serve as Acting Dean of Engineering. A native of Youngstown, Mr. Ellis had acquired experience at Butler High School in Butler, Pennsylvania, Grove City College in Grove City, Pennsylvania, and Bethany College in Bethany, West Virginia, before joining the Youngstown College faculty in the Fall of l946. Mr. Ellis would earn an MS degree in physics from the University of Pittsburgh in l955.

Mr. Ellis continued the policies and practices of his predecessor and received strong support from the faculty and students. It became evident to President Howard W. Jones, however, that the leadership of the school should include an engineer.

Effective in Fall l951, Michael Jean Charignon, BSE.E. and BSM.E., was appointed to serve as Assistant Dean of Engineering. A native of Stanley, North Dakota, Dean Charignon had carried the rank of Lieutenant Colonel in the United States Army during World War II and had served a tour of duty in Kungming, China. He had been superintendent of power generation at Republic Steel from l946 until joining the faculty in l950. Dean Charignon would earn an MS degree in l952 and the Ph.D. degree in l960, both from the University of Pittsburgh.

During academic year l951-52, Youngstown College Student Chapter of the Ohio Society of Professional Engineers was established, open to all engineering students in good standing. The society has its aim in the preservation of ethics and professional standards within its field.

More scholarships that benefited engineering students became available: the Youngstown Sheet and Tube Scholarships in 1951, the Westinghouse Achievement Scholarships for Electrical Engineering and Mechanical Engineering in 1952, and a scholarship award by the Women's Auxiliary of the Mahoning Valley Chapter of the Ohio Society of Professional Engineers, also in 1952.

The school of engineering was in need of more classroom and laboratory space very soon after occupying the William Rayen Building. During the summer of l948, the metallurgical engineering laboratory was moved from the William Rayen Building to the basement of the YMCA Youth Center on East Rayen Avenue, where four metallurgical engineering laboratories were established. By the academic year l952-53, the engineering school was using most of the building, then known as South Hall, with classrooms on the first and second floors and a drawing room on the second floor. In l953, the building was purchased from the YMCA through the generosity of Mrs. Jacob D. Waddell and Mr. John R. T. Clingan and became known as Clingan-Waddell Hall. The office and classes of the mathematics department were relocated from the William Rayen Building to this building in time for the Fall l953 semester. The move left more classroom space for engineering classes at the William Rayen Building and at the same time consolidated the mathematics activities, which were enjoying greater demand. Engineering continued to have limited use of the second floor of Clingan-Waddell Hall until about l955-56 when the home economics department was moved to the building. Today, the former Clingan-Waddell Building is known as Penguin Place, a privately owned building.

It soon became clearly evident that the School of Engineering would have to acquire national accreditation by the Engineering Council for Professional Development (ECPD), which was just as important as accreditation by the North Central Association for the entire college. ECPD had only been accrediting engineering curricula since l936, but such accreditation had rapidly become critical to academic recognition, particularly for graduates seeking admission to graduate study.

The faculty had gained very valuable experience during the previous four or five years and there were reports of excellent performance in the work place by engineering graduates. The engineering laboratories were impressive and a new college library was under construction. The entire community was very supportive of Youngstown College, and the School of Engineering was recognized as a very important asset, particularly by local industry. ECPD would have to look favorably on these assets.

However, the College administration had to have been apprehensive about a criticism that North Central Association had expressed prior to granting its accreditation in l945. In effect, the visiting examiners felt that the faculty as a whole made a poor showing on advanced training,

and rated relatively low on scholarly activity. Quite apart from the North Central report, there had been concern expressed locally because the administration had to resort to hiring more part-time than full-time faculty due to a lack of financial resources. President Jones seized every opportunity to praise the dedication and quality of teaching of the faculty.

Whether or not any of the young faculty members in the William Rayen School of Engineering were impressed by the North Central criticism, or were even conscious of it, is not known. Yet, for several explainable reasons, many of the full-time faculty did become motivated to seek advanced academic degrees, and at a most opportune time in the history of the school. Some faculty had decided to pursue a career in higher education. Some had educational benefits available under the GI Bill. Some may have become inspired by their peers, or perhaps by some former students who were attending graduate school. The situation was not unique to Youngstown College. Following World War II, many engineering schools had of necessity hired some faculty who were in need of additional graduate study. For whatever personal reason(s) each faculty member may have had, attending graduate school became contagious and would continue (even with some yet-to-be-hired faculty) well into the l960s. The University of Akron and the University of Pittsburgh offered graduate work on a full-time or a part-time basis. Many of the faculty commuted for several years, in car pools, to take advantage of the part-time option. Case Institute of Technology and Carnegie Institute of Technology required full-time attendance, which resulted in periods of leave from Youngstown University.

During the four-year period from academic year l949-50 to l953-54, the faculty not only continued to gain teaching experience, but there also occurred a remarkable improvement in their collective credentials as measured by academic degrees and additional graduate study. During l949-50 there were 20 full-time faculty (11 for chemistry, mathematics, and physics, and nine for engineering). Two held the Ph.D., five the master's, and 13 the bachelor's degree. Seven of these faculty (four in engineering) claimed additional graduate study. During l953-54 the total number of full-time faculty was still 20 (with eight for engineering), but four held the Ph.D., 11 the master's, and five the bachelor's degree. Now, 11 of these faculty (including seven in engineering) claimed additional graduate study, with several approaching the Ph.D. degree. The gain of two faculty with the Ph.D and one with a master's degree, as related above, occurred through changes of personnel during the four years. Also, the number of part-time faculty was reduced from 26 to 21.

Aware of the progress being made by the School of Engineering and encouraged by Acting Dean Ellis and Assistant Dean Charignon, President Jones requested consideration for accreditation by ECPD in the Fall of l953. This initial attempt to gain accreditation would be limited to the day and evening programs in electrical and mechanical engineering; the largest demand for day and evening classes was in these two areas. Nonetheless, the entire engineering school as well as the chemistry, mathematics, and physics departments would be involved in the preparation process. Three months before the accreditation visit was to occur, President Jones made an unexpected decision, at least as far as the faculty was concerned. As if to bolster the engineering leadership sector, he brought in a new dean of engineering.

Beginning with the Spring semester of l954, Edward C. Franklin, BEC.E., MSMil.E., was appointed Dean of Engineering. Dean Franklin brought to the college experience gained in a varied military and civilian career. Commissioned a second lieutenant in l925, Dean Franklin served in the United States Army as a specialist in armament research, development, and production. Following active duty in the Pacific theaters during World War II, he retired in l946. From l948 to l952, he was an executive with Sterling Windows Inc. in New Castle, Indiana, and in l952, he undertook a six-month assignment with the North Atlantic Treaty Association (NATO) as a consultant on ordnance problems. (Mr. Ellis and Mr. Charignon would both continue as Assistant Deans.)

Preparations continued to a fever pitch, and finally on May 19 and 20, l954, the eagerly awaited event took place. The inspection team consisted of Dr. John F. Calvert, chairman of the department of electrical engineering of Northwestern University and vice chairman of Region 3 of ECPD, and Dr. Dennistroun VerPlanck, head of the department of mechanical engineering of Carnegie Institute of Technology. The examiners worked under Dr. C. S. Crouse, head of the department of mining and metallurgical engineering of the University of Kentucky and chairman of Region 3 of ECPD. Dr. Calvert was soon to become head of the department of electrical engineering at the University of Pittsburgh.

What had been promised as an event racked with anxiety turned out to be a very pleasant learning experience. The examiners showed great interest in the future of the engineering school, praised some areas of the programs and criticized others, but were very generous with suggestions for improvement. Fortunately, both the Carnegie Institute of Technology and the University of Pittsburgh had had good experience with our faculty and engineering graduates in their graduate programs.

On December 4, l954, President Howard W. Jones was notified by letter that the day programs in electrical and mechanical engineering were accredited by ECPD for a period of three years. The examiners had forewarned that the evening programs would not be accredited until there could be assurance that at least 80 percent of the evening instruction was being provided by full-time faculty. ECPD further recommended to President Jones that he proceed to establish a departmental structure, and thus appoint department heads within the engineering school. The Youngstown Vindicator quoted President Jones: (6)

> "Every engineering college hopes and strives for recognition by the Engineers Council for Professional Development. We are indeed pleased with the approval of our William Rayen School of Engineering and we look forward to further development of our program with the assistance of the Council."

The newspaper also noted that the engineering school had an enrollment of 875 students and that 375 graduates had received the Bachelor of Engineering degree to date. (As mentioned in Chapter I, the Engineers Council for Professional Development - ECPD - would be renamed Accreditation Board for Engineering and Technology - ABET - in l980.)

Thus, the engineering program, which had faded badly in the late l920s, emerged again in the early l930s with assistance from the College of Arts and Sciences and became a full-fledged school of engineering by l946, gaining national accreditation for two of its curricula in l954. Spurred by large enrollments of veterans of two wars and much community support, the school would have the largest enrollment of all the academic units when the name of the institution was changed to Youngstown University in l955. Certainly, "engineering" enjoyed remarkable progress during the Youngstown College era.

CHAPTER IV

YOUNGSTOWN UNIVERSITY

Coping With the Mounting Enrollment

The post-World War II enrollment at Youngstown College peaked at 4,359 in l948 and then declined to a low of 3,142 in l952 before rising again. (7) In the Fall of l955, the enrollment at Youngstown University was 4,597 of whom 1,325 were reported to be veterans of the Korean War; very few World War II veterans remained. By the Fall of l956, provisions of the GI Bill had ended, but the enrollment of Korean War veterans peaked, accounting for l,590 (30 percent) of a total enrollment of 5,269. While the government Readjustment Acts had inspired enrollments in the late l940s and early to middle l950s, it would be the nationwide demand of industry for qualified persons in engineering and the sciences that would be a major cause of increased enrollments in the latter l950s. Thus, even as the number of Korean War veterans declined in the latter l950s, the total enrollment of the university continued to increase to a reported 6,687 by the Fall of l960. Then, beginning in the early l960s, the children of the World War II veterans, the so-called "war babies," began to enroll. Their example encouraged other classmates as well as a variety of non-traditional-type students to attend. Some international students from India and other Far East countries also sought an education in this country. A general thirst for higher education developed, resulting in large enrollments. The university enrollment reached a reported l2,033 by the Fall of academic year l966-67, the last year before the university would join the state system of higher education.

The annual college/university catalogs carried a statement of objectives. Typical in principle is the statement that appears in the 1961-62 catalog, which reads:

> Objectives
>
> "The Youngstown University offers opportunity for higher education to the residents of the Mahoning and Shenango valleys, a highly industrialized region of nearly a million people in Eastern Ohio and Western Pennsylvania.
>
> It attempts to meet the educational needs of this heterogeneous community without regard to race or creed and to offer its students an opportunity for personal development, for the fulfillment of their obligations of citizenship, and for their practical work in life.
>
> To achieve these ends, the University seeks to provide a broad liberal education characterized by habits of free inquiry, exact observation, and critical reading; a familiarity with the general content of the various fields of knowledge; rigorous discipline in some chosen field; and the ability to express thought clearly and forcefully.
>
> This program helps the student to develop a sound philosophy of life, standards of rational conduct and discipline derived from an intelligent understanding of himself and his society, integrity of character arising from sound ethical principles, and a sustained religious faith irrespective of his church affiliation."

Beginning in 1985-86, such an entry in the catalog has been called a mission statement. Now the statement is considerably more elaborate.

The university catalogs relate a dramatic increase in the numbers of faculty. In 1935-36, the first year Dr. Howard W. Jones had the title of President, there were 20 full-time faculty and 24 part-time faculty. The catalog for 1944-45-46, when Youngstown College was first accredited

by North Central Association, included a listing of 37 full-time and 40 part-time faculty. In 1955-56, the total faculty at Youngstown University numbered 137 full-time and 210 part-time, and by 1966-67, the numbers were 291 and 404, respectively. However, at all times the number of part-time faculty who taught were fewer than the number listed in the catalogs because some did not teach every term.

Steadily increasing enrollments also demanded attention for more and more space for classrooms, laboratories, and faculty offices. In 1958, the School of Engineering was provided space for classrooms, drawing rooms, and faculty offices on the third floor of the Youngstown Board of Education building, which adjoins the William Rayen Building.

In the Fall of 1959, the first section of Ward Beecher Hall (just south of Tod Hall) was completed. By the Fall of 1960, this four-story pink brick building, then known as the Science Building, housed the chemistry, physics, biology, and geology departments and their laboratories, and the laboratories for chemical engineering. Of much interest at the time was the subcritical nuclear reactor provided by the Atomic Energy Commission. (The last two of the four army barracks once known as the Annex were dismantled at this time. One barrack - the one furthest north - had been removed when the library, Tod Hall, was built; another - the next in line to the south - was removed in 1955.) Ward Beecher Hall would be extended south to Lincoln Avenue in 1967, providing for the planetarium and vastly expanding the other facilities of the Hall.

In 1962, the Central Hall Annex was built adjacent and to the north of Central Hall, providing a dining room and a bookstore. In 1973 Central Hall would be torn down and the brick Annex building would be physically moved to its present location north of Tod Hall, to house Central Services and the Post Office.

In 1960, the Department of Education became the School of Education. The Elm Street School building (now known as Fedor Hall) at the northwest corner of Elm and Spring Streets was purchased and remodeled in 1965 to house the School of Education, the women's health and physical education department, and the geology department.

In 1962 the first phase of Kilcawley Center was completed, which included the seven-story housing facility (now known as Kilcawley House) and the adjacent building with dining areas and meeting rooms. Expansion and remodeling would be completed in 1974, 1976, and 1981, thus providing the current bookstore, student organization offices, and a host of other services.

Youngstown University continued to maintain a tuition rate that ranked among the lowest for colleges and universities in the region. In 1955-56 the yearly tuition (excluding summer school) for a 16 semester-hour class load was $397 plus nominal $2.50, $5.00, and $10 laboratory fees, where applicable. In 1966-67 the yearly tuition for the same service was $576 plus laboratory fees of $25.

There was much growth in all of the academic divisions of the university, except for law. The Law School was phased out beginning in the Fall of 1957. The school had provided the educational opportunity for many successful practicing attorneys in the Valley, but the enrollment had never been very large, reaching a high of 130 students in 1952-53. The North Central Association became uncomfortable because the faculty were all hired on a part-time basis. In 1949 the American Bar Association inspected the School and found the program to be of high quality, but refused accreditation for lack of at least three full-time law professors. The university made a concerted effort to make the Law School more attractive and hired the first full-time law professor in 1955, but the enrollment continued to decline. The Board of Trustees concluded that the school had become a financial liability. Serious hope for the Law School

ended in September 1956 with the untimely death of Raymond L. Falls, AB, LL.B., the Dean. It was indeed unfortunate that the academic division which had attained greatest prestige in the early years would be the first to be discontinued.

The year 1958 marked the 50th anniversary of the founding of the university (stemming from the founding of the Law School in 1908). The main function celebrating the occasion was a three-day campus-wide open house (November 17, 18, and 19, 1958), culminating in a convocation at Stambaugh Auditorium the final evening. The open house featured exhibits and/or demonstrations by most academic departments, and exhibits obtained from Westinghouse Electric Corporation, Cook Electric Company, General Dynamics Corporation, U.S. Steel Corporation, the U.S. Army, and the U.S. Air Force. The Youngstown Vindicator provided excellent publicity for the open house. (8) Earlier in the year the Jambar published a special semi-centennial issue citing important events in the history of the university. (9)

The Growing Engineering School

At this point it seems appropriate to review the stated objectives of the School of Engineering. To be consistent with the statement on university objectives given on page 30, the 1961-1962 catalog is again used as the reference.

Objectives

> "The aim of the William Rayen School of Engineering is to complete the general objectives of the University by providing a rigorous discipline in engineering based on a sound understanding of the fundamental sciences and arts upon which all engineering rests.
>
> Each curriculum therefore combines three interrelated programs; a basic science one, a technical one, and a liberal arts one. The basic science program, consisting of mathematics and the physical sciences, provides the basis for the technical program and increases the student's knowledge of the world around him. The technical program teaches the application of science to the problems of engineering. The liberal arts program is designed to teach the student to express himself clearly and to understand better both himself and other people, and thus deal more intelligently with the problems he will face both as an engineer and as a citizen and an individual.
>
> In addition, certain courses in business administration are included, to improve the student's understanding of the broader area in which his engineering training will be applied."

In order to better appreciate the growth experience of the School of Engineering, it is necessary to relate national and regional events and trends that affected the effort. Curricula were influenced by advancements in science and technology and by trends in engineering education. Enrollments varied with the demand for engineers and the local industrial climate.

We recall from Chapters II and III that the campus enrollment increased after World War II up until 1966, except for a single dip from 1948 to 1952. The engineering school enrollment oscillated (frequency wise), however, in accord with national statistics on the enrollment of first-year engineering students. In l948, the U.S. Bureau of Labor Statistics warned of a surplus of engineers because of large graduation classes of World War II veterans. This warning and the draft for the Korean War resulted in a national decline of 56 percent in the annual freshman engineering enrollment, from 80,000 to 35,000, by 1950. (10) The engineering school enrollment locally dropped 19 percent, from 799 to 648. Then, in the early l950s, a national shortage of

engineers was declared because of the Korean War and developing competition with the Soviet Union; from 1952 to 1955 annual freshman enrollments increased 78 percent nationally, from 45,000 back up to 80,000. By the Fall of l955 the engineering school enrollment locally increased 88 percent, from 643 to l,209, making it the largest of the academic divisions with 26 percent of the total enrollment of 4,597. The engineering school would enjoy this status for two more years, accounting for 1,545 (27 percent) of the total of 5,638 in the Fall of l957. During the latter l950s, all engineering graduates received employment offers (many received multiple offers) and there was much employment opportunity in the local region. However, in l957, there occurred some defense industry cutbacks which resulted in press announcements that the shortage of engineers had passed. By the Fall of 1962, annual freshman engineering enrollments again dropped nationally by 20 percent to 64,000, and the engineering school enrollment here declined 23 percent to 1,191. But, in 1963, the Bureau of Labor Statistics warned that serious shortages would occur if engineering enrollments did not increase; by 1966, first-year enrollments once again reached 80,000 nationally, an increase of 25 percent. Aerospace industries were particularly active and attractive. The engineering school enrollment climbed 28 percent to 1,521 in the Fall of 1966, but by then the school ranked fourth in size behind Arts and Sciences, Business Administration, and Education, accounting for about 13 percent of the total university enrollment.

At this point the reader is probably questioning how a change in freshman engineering enrollment nationwide might have affected a change in total engineering enrollment at Youngstown University, or anywhere else. If the nationwide enrollment trend was the only variable, we might consider a hypothetical case of an engineering school consisting solely of full-time students operating under steady state conditions of enrollment. Suppose that the past freshman class size has been constant at 1,000 students and that, due to attrition, sophomore, junior and senior class sizes have also remained constant at 800, 650, and 550, respectively. The total enrollment would have been 3,000 in the Fall of each academic year. Now suppose that the next Fall the freshman enrollment reflects a nationwide increase of 30 percent, thus becoming 1,300. The total Fall enrollment for engineering would increase 10 percent to 3,300. By this model, which employs an attrition rate of about 50 percent, the percentage change in total enrollment is one-third the percentage change in the freshman class size.

The engineering enrollment at Youngstown University included students who attended full time and earned their degree in four to five years, students who attended part time for as long as 12 to 15 years, sometimes dropping out for a period of time to accommodate job demands, and students whose scenario of attendance was anywhere in between. Some students transferred into the program, others transferred out, and the attrition rate was in the neighborhood of 45 percent. The enrollment picture, which was comprised of about two-thirds full-time and one-third part-time students, was far more complex than the hypothetical model described above. Still, for simplicity's sake, the author believes that the hypothetical model provides reasonable approximations for use in rationalizing the changes that occurred in the total engineering enrollment.

From 1950 to 1952, the engineering school enrollment dropped 19 percent, which is consistent with one-third of the 56 percent decline in nationwide freshman enrollments. However, the actual decline in local freshman enrollment was probably less than 56 percent because the graduation classes were relatively large. From 1952 to 1955, the local engineering enrollment increased 88 percent, which was much greater than one-third of the national freshman enrollment increase of 78 percent. Relatively fewer students graduated during the period, but it is clear that the engineering school thrived. Recent graduates had good jobs and were performing well, the news was out that the school was accredited by ECPD (ABET), the tuition was relatively low, and local interest in higher education was on the rise, all of which benefited the enrollment. The engineering school enrollment declined 23 percent from 1957 to 1962, and then increased 28 percent by 1966; both events exceeded one-third of the corresponding national

trends, which were a drop of 20 percent followed by an increase of 28 percent. Much of the excessive dip in the engineering school enrollment between 1957 and 1966 is attributable to a depression resulting when the demand for steel declined locally to 25 percent of capacity in l958. The demand for steel returned to 68 percent of capacity in 1961, and became nearly normal again by 1963. Certainly, the engineering school enrollment was affected both by national enrollment trends and by the local industrial climate. Sometimes the enrollment of employed part-time students was out of phase with economics; when business was booming they would be too busy to go to school, but they would perhaps carry a heavier class load during slack periods.

In compliance with the recommendation by ECPD (ABET) in l954 to designate department heads, President Howard W. Jones appointed faculty to head chemical, electrical, and metallurgical engineering beginning in the Fall of l955. A department head for mechanical engineering was named beginning Fall l956, for civil engineering beginning Fall l958, but for industrial engineering not until Fall l967. Until these appointments became effective, an engineering dean acted as department head.

At the completion of the spring semester of l956, Dean Edward C. Franklin resigned and subsequently took a faculty position at Georgia Institute of Technology in Atlanta, Georgia. Michael J. Charignon became Dean of Engineering and Frank M. Ellis continued as Assistant Dean until 1960.

In Chapter III (see page 27) the growth of the faculty as measured by academic degrees and additional graduate study during the four year period from 1949-50 to 1953-54 was enumerated. Included were data for the full-time faculty for chemistry, mathematics, physics, and engineering. The objective was to give appropriate credit to the group of faculty who were most instrumental in the success of the first ECPD (ABET) accreditation. The intention here is to extend the discussion on faculty growth to cover the 13-year period from 1953-54 to 1966-67, the last year the university would be a private institution. However, because the department of mathematics was relocated to Clingan-Waddell Hall in 1953, and the department of physics to the new science building in l960, it seems more appropriate at this point in our history of "engineering" to include only engineering faculty in the discussion. Numbers in the table below designate the number of engineering faculty holding the particular degree as their highest degree; numbers in the far right column designate the number of faculty claiming additional graduate study.

		Full-Time Faculty			
Year	Bachelor's	Master's	Doctorate	Total	Graduate Study
1953-54	4	4		8	7
1960-61	8	9	4	21	6
1966-67	2	16	7	25	7
		Part-Time Faculty			
1953-54	13	3		16	4
1960-61	9		2	11	3
1966-67	8	4	3	15	3

The number of full-time engineering faculty was increased from 8 to 25 during the 13-year period, while the engineering enrollment increased from 723 in the Fall of 1953 to 1,521 in the Fall of 1966. By the Fall of 1966, the profile of academic degrees was much improved, with 23 of the 25 faculty holding advanced degrees and 7 claiming additional graduate study. A point of contention by some outsiders, however, was that almost 50 percent of the full-time faculty, 12 of the 25, had received their first academic degree from Youngstown University (or Youngstown College). Such hiring practice was criticized by accreditation visitors as "inbreeding" (tending to

perpetuate old ideas and discourage new) and was curtailed by future administrations. Dean Charignon believed, however, that any objection should become less important once a faculty member earned an advanced degree elsewhere. The issue was not open to debate, but the facts remain that 12 of 14 (Youngstown) engineering graduates hired as full-time faculty during this period did earn an advanced degree(s) elsewhere and that all 14 proved to be a great asset to the school, some for many years.

The numbers of part-time engineering faculty given in the table were typical for the 13-year period, but the number fluctuated considerably from year to year (sometimes even from semester to semester). For the data given, both for l960-61 and l966-67, about 60 percent of the part-time faculty had received the first degree here. (In l953-54, only three engineering faculty - one full time and two part time - had earned their first degree from Youngstown College.) Historically, most of the part-time faculty held full-time positions in local industry.

The ratio of the numbers of part-time to full-time faculty decreased from two in 1953-54 to well under one by 1960-61 and thereafter. On the average, the teaching load for a part-time faculty member was about a third of the load carried by a full-time member. Thus, during the 1960s, an estimated 85 percent of the total teaching load was carried by the full-time faculty.

The increase in the number of full-time faculty allowed the engineering school to cope with the large increase in enrollment and to provide relief in teaching loads and class sizes. By the time the university became state affiliated, the teaching loads for the full-time faculty had decreased from the 18 semester-hour level of the late 1940s and early 1950s to a range of 12 to 14 semester hours per semester. Perhaps the most welcome relief was a reduction in the number of evening classes that each faculty had to teach so as to accommodate the large part-time student population that worked during the day. Another welcome relief was a reduction in the number of theses to be advised per faculty member.

The second ECPD (ABET) accreditation visit occurred in 1957, resulting in accreditation for both the day and evening programs in electrical and mechanical engineering; in l959, accreditation of the day and evening programs in civil engineering was added. The accreditation team was somewhat lenient when accrediting the evening program in mechanical engineering by excluding engineering drawing classes when determining if 80 percent of the evening classes were being taught by full-time faculty. Mechanical engineering provided drawing instruction as a service to all engineering programs, thus, drawing constituted about one-fourth of the department teaching load.

Once university curricula are accredited, the accrediting agency maintains a vigilance over degree requirements in accordance with established standards. Such standards are modified from time to time. The university also tries to maintain a philosophy on education, and where differences occur, compromise is required. An important case in point is the so-called “general graduation” requirements, a topic which spans this history from the mid-1940s onward.

Although President Jones always believed that every student should have a liberal arts background as part of his or her Youngstown College education, serious study of the subject started in 1945 when the North Central Association report stated that “the program of general education in the curriculum of the College remains relatively undeveloped.”

Under the leadership of Professor Karl W. Dykema, M.A., Director of the Division of Language and Literature, and Chairman of the Department of English (and later Dean of the College of Arts and Sciences), a summary of courses required for graduation was developed for the next accreditation visit by North Central and was first published (in table form) in the 1955-56 University catalog. Common basic requirements for all degrees granted by the University were nine semester hours of Communication, four semester hours of Health and Physical

Education, 12 semester hours of Social Studies (consisting of six semester hours of Social Science and six semester hours of United States History), three semester hours of Religion, a minimum of three semester hours of Science or Mathematics, and Orientation (attendance credit initially, later one sem. hr. credit). However, because the school of engineering had traditionally considered knowledge of economics and business organization to be essential in the background of an engineer, compromise allowed three semester hours of Economics and six sem. hrs of Business Organization (neither of which were acknowledged in the table) to be substituted for the six semester hours of United States History. Also listed in the table were degree requirements for laboratory science, foreign language, English, and psychology; all without commonality among degrees. With minor exceptions, the table of graduation requirements remained essentially unchanged by 1966-67, but the engineering school had dropped the Business Administration requirement (except as required for industrial engineering) in favor of three semester hours of United States History.

The matter of graduation requirements continued to receive attention (in consultation with the various accrediting agencies) after the University became state affiliated (on the quarter system of terms where one and a half quarter-hours is the equivalent of one semester hour). In 1995-96 the published requirements for four-year degrees granted by the university include eight quarter hours of English Composition, six quarter hours of Health and Physical Education, a minimum of 16 qtr. hrs of Social Studies, a minimum of eight quarter hours of Humanities, and a minimum of 12 qtr. hrs of Science and Mathematics. Social Studies now include courses in economics, geography, history, political science, psychology, social science, sociology, and Black Studies I. Humanities include literature courses in the English or Foreign Language Departments, courses in philosophy and/or religious studies, history and/or appreciation courses in the Department of Art, the Department of Communication and Theater or the Dana School of Music, and Black Studies II. The combined credit of 24 quarter hours in Social Studies and Humanities meets the ABET (ECPD) requirement of one-half year devoted to these areas, although ABET prefers a division of 12 quarter hours in each area (another compromise) and that course selections provide for breadth and depth of subject matter. (The traditional economics requirement is now satisfied by a course on engineering economics which is offered by the Department of Industrial and Systems Engineering.)

A combination of factors brought about many changes in the engineering course content of the curricula during the Youngstown University era. A major influence beginning in 1955 was the Report on Evaluation of Engineering Education (Washington, D.C.: American Society for Engineering Education, 1955), which became known as the Grinter Report (after L. E. Grinter, chairman of the committee that prepared the report). The report called for changes that would make engineering education more scientific. Critics of the report cautioned that too much attention to science would result in a de-emphasis of creative design that distinguished engineering, and that engineering schools might thus become second-class science departments.

Nevertheless, a trend toward science was set in motion. Each visit by an ECPD (ABET) accreditation team brought suggestions for extending the curricula: a new course to cover an emerging subject area, a greater breadth or depth (or both) of coverage in an existing course (sometimes requiring the addition of a second-level course), a new emphasis in some laboratory that would require additional laboratory equipment, etc., any of which would inevitably make the program more scientific. New undergraduate engineering textbooks on the market also supported the trend. Added articles and chapters gradually introduced topic extensions that were previously found in graduate textbooks. Eventually, the preface of some textbooks would state that the textbook was intended for advanced undergraduate and first-year graduate study.

The move to include more science in engineering was fueled in part by the advancements in technology resulting from the race beginning in 1959 between the United State and Russia to

land on the moon; Neil Armstrong was the first astronaut to set foot on the surface on July 20, 1969.

The engineering faculty made numerous changes in the curricula from 1955-56 to 1966-67: revising and upgrading existing courses, introducing several new courses of note, and dropping others. The total number of engineering courses (excluding theses) listed in the catalog was increased from 94 to 112; the number that included laboratory work (excluding drawing) increased from 27 to 33.

The chemical engineering department introduced courses on chemical kinetics and on process dynamics, and would soon offer a course on the principles of nuclear reactors (with an associated laboratory course). Civil engineering added a third-level course on surveying, a course on advanced concrete design, a course on soil mechanics (with a laboratory course), and was planning several advanced courses on structures. The electrical engineering advancements included a course on electromagnetic field theory; a two-level course sequence on control systems analysis (with laboratory courses); a course on electronic circuits, signals, and systems; a course on molecular engineering; and would soon include courses on quantum electronics and plasma dynamics. Major advancements for industrial engineering included courses on production planning and control and on operations research, and plans were under way for a sequence of three sophomore-level courses on computer fundamentals and techniques. Mechanical engineering introduced courses on heat transfer (with a laboratory course), advanced strength of materials (with a laboratory course), dynamics of machinery, and compressible fluid flow, and would soon add a two-course sequence on engineering analysis. The advancements for metallurgical engineering included courses on advanced metallography, X-ray metallography (including laboratory work), and advanced materials science, and a course was being developed on mechanical metallurgy.

Increased use was being made of vector mathematics, partial differential equations, Fourier analysis, Laplace transform methods, and statistics. In the catalog for 1959-60, there appeared the first computer course on campus, an elective course introduced by the civil engineering department. The course description read:

> 441. Computer Techniques. Principles and uses of computing machines to solve engineering problems. Analysis, development, and programming of data and interpretation of solutions. Prerequisite or concurrent: Engineering 326 (Elementary Strength of Materials) and Mathematics 309 (Differential Equations). 3 hours credit

Among other topics this course covered machine language, flow diagramming, and the preparation of data and instruction cards to be used with a digital computer. The industrial engineering course on operations research (introduced in 1964-65) also included linear computer programming. Analog computers were used in the electrical engineering courses on control systems analysis and in the laboratory course on mechanical vibrations.

The topics of many of the engineering theses also reflected the move toward science. In 1953-54, there was much evidence of design by students involved in developing equipment for classroom demonstration and/or laboratory use. The ECPD (ABET) accreditation team cited the thesis as being a great asset to the programs. As more science crept into the theses, subsequent accreditation visitors continued to praise the thesis concept, but there were mixed reviews about design vs. science. As time passed, some of the thesis topics became undeniably science-oriented and some involved investigations into graduate coursework. With a little more effort, a few of the undergraduate theses might have qualified as master's degree theses 10 years later.

In 1965, the Goals of Engineering Education - The Preliminary Report (Washington, D.C.: American Society for Engineering Education, 1956) appeared. The report reaffirmed the findings of the Grinter Report and called for the next move – to encourage graduate study, especially a master's degree, in preparing people for entry into the engineering profession. Although about one-third of all American graduates were going on to a master's degree, critics of the Preliminary Goals Report feared a loss of professional recognition for those who could not qualify for graduate school and a potential downgrading of the master's degree if undesirable conformity were imposed. Several faculty of the William Rayen School of Engineering were elated by the report, with the hope that it might serve as a force to start a graduate program.

Several student engineering organizations were established during the Youngstown University era. In l956, the American Society of Mechanical Engineers (ASME), Student Chapter, became available to students interested in mechanical engineering. The Youngstown University Society of Student Civil Engineers was organized by ASCE in l957 to encourage the development of a professional consciousness and to promote friendly contacts with professional engineers. Also in l957, the Student Chapter of the American Institute of Electrical Engineers (AIEE) was established as a technical society affiliated with the national AIEE. And, still another in l958, the Youngstown Society of Industrial Engineers started a student chapter with the aim of fostering a high degree of integrity among future members of the industrial engineering profession.

During the academic year 1956-57, Dean Charignon founded the Dean's Council of the William Rayen School of Engineering, comprised of representatives from each of the professional and honorary societies as well as the school's representatives on the University Student Council. The council continues to advise the dean in matters of student welfare and to participate in various functions such as open house events and the annual Engineers' Ball (the first one was held on October 24, 1959), where the highlight of the evening is the crowning of the Engineer's Sweetheart and the naming of Mr. Engineer for the year.

Many of the faculty supported the various student organizations, serving as advisers, attending meetings and social functions, etc. Faculty also made their professional expertise available to students and other interested parties preparing for the professional engineers' examination. Beginning about 1951, a few faculty had participated in the refresher course offered by the Mahoning Valley Society of Professional Engineers at South High School each spring. As the years passed and the engineering faculty grew in numbers, the MVSPE relinquished the activity to the university; today the refresher course is offered as a continuing education course by the Office of University Outreach.

Several more annual awards for outstanding engineering students were established. The Youngstown Chapter of the American Institute of Industrial Engineers started the A.I.I.E. Award in 1956, given to the outstanding industrial engineering graduate. In 1957, the Sigma Tau Engineering Award was established to honor the outstanding engineering freshman. The Society of American Military Engineers initiated 20 annual awards in 1957 for R.O.T.C. cadets, 10 for students in next-to-the-last year of their engineering program, and 10 to students in their final year. (A unit of the Reserve Officers Training Corps – R.O.T.C – was established on campus in 1950 and administered by the Department of Military Science.) Also, the Armed Services Communications and Electronics Association Award was initiated for the outstanding R.O.T.C. cadet majoring in electrical engineering. The American Chemical Society Student Affiliate Award was started in l958, honoring the outstanding chemistry or chemical engineering graduate. In l962, the American Institute of Electrical Engineers, Sharon Section, established an annual Electrical Engineering Award for the outstanding electrical engineering graduate. Also in l962, the American Society of Civil Engineers, Youngstown Branch, started an annual Civil Engineering Award given to the outstanding graduate in civil engineering.

Five more scholarships that benefited engineering students were established: the Westinghouse Industrial Scholarships (for their employees) in 1956; the Mahoning Valley Technical Societies Council Scholarship in 1958; the Youngstown Dunbrick Company, Incorporated Scholarships in 1962 (for a student interested in a career in the building industry); the Koppers Company Scholarships in 1962 (for a deserving student, preferably an upperclassman in chemical engineering); and the Youngstown Building Materials and Fuel Company Scholarships in 1963.

The William Rayen School of Engineering grew considerably during the Youngstown University era. By the Fall of 1966, the enrollment exceeded 1,500; there were 25 full-time and 12 to 15 part-time faculty. There was a well balanced mixture of professional expertise and experience among the faculty, most of whom held professional registration. The curricula had been reviewed and revised constantly. The availability of funds for laboratory equipment was limited, but improvements had been made when justified (sometimes on a shared basis). Graduates were progressing well at their jobs, which in turn promoted good rapport with industry. Was the school ready to handle the changes in store during the next few years? It most certainly was.

Changing of the Guard

President Howard W. Jones and the Board of Trustees had always been committed to the concept of financing the university largely through private contributions, and to this end, local industry and individuals had been generous. However, by the mid-1960s, it became apparent that private contributions and the modest student tuition could no longer support the educational program and the proposed expansion of physical facilities. In April of 1966, it was estimated that the president would have to raise a million dollars a year just to keep the university operating, thus state and federal assistance would be necessary.

In 1963, Governor James A. Rhodes proposed state funding to establish a community college in the area, which might be operated by the University (while remaining a private institution). President Jones opposed the proposal on the grounds that another college was not needed and that it would compete for students and for future funding. Some local industries favored the idea of it being a technical institute which might benefit employees who did not have the opportunity to go to college, and the powerful labor unions supported the proposal vigorously (and might well have taken on the project). The citizens of Youngstown settled the issue, however, when they voted down the additional tax burden that would result.

In 1965, the university was reaccredited by North Central Association. The visiting committee praised the accomplishments of the university over the past 30 years, but also suggested several corrective actions, most of which could be translated into a higher cost of operation. The suggestions included some decentralization of responsibility in administration and increased consultation with the faculty, long-range academic planning to supplement the efforts of the faculty, improved faculty office facilities, and a reduction of faculty teaching loads to release time for research.

President Jones called a meeting of his most trusted advisers within the university to consider whether the university should apply for admission to the state university system or attempt to remain a private institution. Emotionally the group was opposed to a change, but found that there really was no alternate but to “go state.” On January 31, 1966, Dr. Jones submitted his resignation to the Board of Trustees so that a new president could be found to handle the transition from a private to a state university.

Meanwhile, in 1965, the University had applied for, and received, a state grant of $5,000,000 to build a Science and Engineering Building. Under the conditions of the grant, the university would cede the site to the state; the state would then lease the building to the university at a nominal cost for 50 years. However, at the ground-breaking ceremony on March 8, 1966, the Governor invited the university to become a branch of the state university system. A special committee was appointed by the Board of Trustees to consider the matter, and in April 1966 they reported unanimous support for the move.

In May 1966, the Board of Trustees chose Dr. Albert L. Pugsley, BS in C.E., M.Arch., Sc.D., L.L.D., to be the University's second president. A native of Woodbine, Iowa, Dr. Pugsley was the administrative vice president of Kansas State University in Manhattan, Kansas, where he began as a professor in 1943.

It took more than a year to complete all the complex legal actions necessary to join the state university system. A new Board of Trustees was established, consisting of nine members (with staggered nine-year terms) appointed by the Governor of Ohio with concurrence of the Senate. The rights to all properties (including those originally owned by the YMCA) which had been donated to the university on a conditional basis had to be cleared with the donors. Continuance of employment for all university employees at equal to or higher compensation had to be assured. The Youngstown Educational Foundation was established, to which all assets of Youngstown University were transferred except real estate, equipment, and the construction fund. (This foundation, with Dr. Howard W. Jones as its first president, would support higher education in the Valley; the annual funding of numerous scholarships administered by Youngstown State University is one of their important functions.) A bill to create Youngstown State University was approved by the Senate and the House of Representatives, and signed into law by Governor Rhodes on May 11, l967. The university officially became a branch of the state system on September 1, l967.

President Albert L. Pugsley wasted no time in implementing plans for the future. By early Fall 1966, university-wide preparations were under way to convert to the quarter system of terms, with all changes in curricula, course descriptions, etc., due in time for the printing of the 1967-68 catalog. In addition, academic units interested in extending their educational activity to include graduate study were invited to prepare a preliminary proposal for a master's degree program. These important events, which are generally associated with the university's acquisition of statehood, are discussed further in Chapter V.

The retirement of President Jones marked the end of an era, but there continued to be great expectations for the future. He had been the man in charge for 35 years - an energetic administrator, an accomplished fund raiser, and a respected gentleman. A nucleus of the university personnel who had joined the institution in the late 1920s, 1930s, and early 1940s were also considering retirement. Most of these persons had become household names through teaching, university service, and personal accomplishments. Space limitations in this writing, and the risk of an omission, preclude discussion of all of them. The author would be remiss, however, not to include Joseph E. Smith, Ph.D., and his wife Mary Boyer Smith, AB, both of whom gave lengthy service and were known by everyone because of their positions and unfailing dedication to the welfare of the university and the students.

Dr. Smith joined the university in 1921 as a part-time professor of social science. In 1937, he joined full time as head of the department. He served as Dean of Men (1940-47), Dean of Students (1947-49), Dean of Arts and Sciences (1950-63), and Dean of the University (1949-67), retiring in 1967. He had also served as Head of the Economics Department and Associate Director of the Division of Social Sciences for periods of time. Dr. Joseph E. Smith was an authority on labor/management relations and served on the War Manpower Commission during World War II.

Mary B. Smith joined the university in 1940 as a full-time faculty member teaching biology. She served as Assistant Registrar (1944-57), Recorder (1957-67), Registrar (1967-72), Assistant to the Dean of Admissions and Records (1972-74), and Director of the Student Placement Service (1974-81), retiring in 1981. Mrs. Smith also served as Head of the Physical Education Department at various times.

Several others among the older generation of faculty and administrative personnel had held key positions for a number of years. They knew what the president expected and worked well as a team. Job security by way of "tenure" for the faculty and "expectancy of continued employment" for administrators and staff had not been available, nor had there been provision for sabbatical leaves. Matters of promotion and salary were at the discretion of the central administration (with input from division leaders and approval by the Board of Trustees), and were awarded largely on the basis of merit. Full-time personnel looked forward to a letter of welcome from the president each fall, advising them of a salary adjustment and perhaps a Christmas bonus. Unless otherwise negotiated, annual employment of the faculty had included teaching in the summer session.

CHAPTER V

YOUNGSTOWN STATE UNIVERSITY

The Engineering Science Building

Becoming a branch of the state system of higher education in Ohio brought about changes in procedures and academic programs, the hiring of additional personnel, increased funding for equipment and supplies, and a building program that started with the Engineering Science Building and has continued to the present time. All academic and administrative units of the university were affected, but perhaps the most busily involved at the outset was the William Rayen School of Engineering.

Several months prior to ground breaking in March, l966, Dean Charignon began meeting with the architects and engineers of Hubbell & Benes and Hoff, Inc., Cleveland, Ohio, regarding classroom, laboratory, and office needs in the new engineering building. (Joseph Bucheit & Sons Company was the general contractor, The Scholl-Choffin Company the mechanical contractor, and Lake Erie Electric Company the electrical contractor. All three of these companies were headquartered in Youngstown, Ohio.) His faculty and department chairmen were given ample opportunity to identify laboratories (and necessary utilities therein) required for their respective programs. Also included in the five-million-dollar grant for the building was one and a half million dollars earmarked for fixed and movable equipment. Each department saw a potential for spending more money than perhaps had been allotted to the entire engineering school over the previous 20 years. Once the faculty became caught up in the opportunity, the dean found himself coping with some very ambitious requests for both laboratory space and equipment.

Faculty members were able to plan for an extension of the laboratory capabilities and for a more ideal learning environment. Most of the equipment at the William Rayen Building was in good working condition, but very limited in terms of multiples of units. Thus, laboratory instruction had often included demonstrations and/or experiments set up for group participation, either of which carried a potential for minimal hands-on experience with the equipment by the students. With dramatically increased funding available, the laboratories could now be reorganized to include several well equipped stations so that students might work in small groups. The acquisition of some sophisticated (and expensive) items of equipment, previously only imagined, could also be considered.

The process of procuring the equipment would continue for a year or two after the building was occupied. Under state regulations, purchase orders for equipment must include specifications for the capabilities of the equipment so that proposals might be sent out for bids. Once a decision was made on which bid to accept, several months might be required for delivery. Overall, the engineering school faculty did a very good job of selecting laboratory equipment that fulfilled the fundamental needs of the academic programs and provided capabilities that could inspire future research. Much of the equipment is as essential today as it was when purchased and cannot readily be replaced in view of current high prices and the need for new types of equipment on the market, most notably computers and computer accessories.

Observing the construction of the building was a very interesting learning experience. Each stage provided evidence of engineering theories and practices for both faculty and students. When completed, the five-story L-shaped structure would have 171,000 square feet of usable floor space which included 48 laboratories, 30 classrooms, and eight research and development rooms. For the first time in history, all six engineering departments would be housed in the same building. Although there was work yet to be completed, the school was permitted to occupy the new Engineering Science Building in December of 1967, and classes were held there beginning

with Winter quarter in 1968. The dedication was held on September 24, 1968, with Governor Rhodes providing the address and President Pugsley accepting the building from Dr. Robert F. Doolittle, Vice Chairman, Ohio Board of Regents. A reader interested in a description of the facilities and the new equipment is invited to read Exhibit IV on page 76.

Moser Hall

Computer hardware became available for "engineering" in about 1962 when a model IBM 1620 computer was housed in the basement of the library (Tod Hall). The IBM 1620 was equipped for card access or typewriter access. By 1967, two more computers were added, a model IBM 360-40 and a model IBM 360-30, and all three were soon located at the computer center on the second floor of the new Engineering Science Building. Engineering personnel and advanced students gained use of the IBM 360-40 either by card access or through one of 10 remote terminals located throughout the building. For need of more space and also to facilitate use of the computer facilities by the administration and other academic units, the computer center was relocated to the basement of Tod Hall in 1978 and remained there until Meshel Hall was completed in 1986. Computer facilities were periodically updated and expanded to meet demands; currently the heart of the computer center consists of an AMDAHL 5868 Multiprocessor complemented by an AMDAHL 5860 Uniprocessor in support of hundreds of peripherals.

Early computer classroom facilities for introductory instruction were supervised by the Department of Industrial Engineering. There were model 1636 Monroe Programmable Calculators in 1969, replaced by model TI-85 Texas Instrument Programmable Calculators in 1973. These were replaced by model 550-2 Sanyo Personal Computers in 1985. By that time, personal computers were becoming available throughout the campus. Today they are in abundance and are being replaced with newer more powerful models about every five years. (Personal hand-held calculators appeared in about 1970 and continue to gain in sophistication.)

In early Fall 1972, Dean Charignon decreed that the time had come to show the Engineering Science Building to the public and he appointed a committee for the purpose. All departments housed in the building at the time were represented: the six in engineering, engineering technology, computer science, mathematics, criminal justice, and continuing education. The title for the event was "Technorama '73" and it was held on Sunday, February 25, 1973, from 1 to 7 p.m. The effort expended in preparing and advertising was rewarded by a huge turnout, estimated to be in excess of 5,000 people. As usual, The Youngstown Vindicator provided excellent publicity. (11) Various other news media were also very cooperative.

Term Conversion

The next activity in the process of becoming a State university that required considerable attention, starting in Fall 1966, was converting the curricula from the 16-week, two-term semester system to the 10-week, three-term quarter system. The syllabus and catalog description of every course had to be revised and assigned a new number and credit designation. The primary objective, of course, was to preserve the academic features of the curricula and not penalize students who were in midstream of completing their degree requirements. Course numbering which had ranged from the 100s for freshman-level courses to the 400s for senior-level courses was changed to cover the range from the 500s to the 800s. Credit designation for revised courses was based, as nearly as practicable, on one and one-half quarter-hours being the equivalent of one semester-hour. In the process, the total number of engineering courses (excluding thesis) was increased from 112 to 172; the number that included laboratory work (excluding drawing) increased from 33 to 45. All curriculum changes were subject to approval by both the school/college curriculum committee and the curriculum committee of the newly formed University Senate. Approvals had to be finalized by a deadline in June so that the new courses could be eligible for state subsidy when they were offered beginning Fall quarter 1967. (The state fiscal year is from July 1 to June 30.)

The requirements for the Bachelor of Engineering degree were reduced in stages from what would have been 225 quarter-hours on direct conversion from 150 semester-hours down to 200 quarter-hours by the Fall of 1971. The major change occurred beginning in Fall quarter 1967, when freshmen who could qualify academically by virtue of their high school record and an entrance examination would no longer be required to take a year of freshman mathematics below the level of calculus.

The 1967-68 catalog related greater autonomy for academic departments. For the first time in history, the engineering courses were not listed under the single heading "Engineering," but rather were broken down to show a list of courses offered by each of the six departments. Also, the prefix for course numbers clarified the source of the offering, e.g., E.E. 7__ instead of Engr. 3__ in the case of a junior level electrical engineering course. Greater autonomy also brought a demand for greater accountability. Departments became responsible for maintaining academic files (for advising purposes) for their student majors, and procedures for submitting class schedules, book lists, purchase orders, etc., became more structured. Many academic departments were assigned a secretary for the first time. Preparation of an annual budget request and an annual report on the inventory of equipment (office and laboratory) were added to the responsibilities of the chairman (chairperson).

The word "productivity" became the household term when evaluating teaching effort, the units being student-quarter-hours. For a single class, productivity was the product of the number of students enrolled and the number of quarter-hours credit for the course. The productivity of a faculty member over a period of time was determined by summing the productivities of the classes taught by the faculty member during the period. Further summations could yield measures of department and school/college effort. Productivity was used to justify the need for

additional personnel and for other budgetary considerations. (Prior to becoming a State institution, teaching loads were generally the total number of semester-hour credits taught; adjustments to reconcile unusual class size situations required special consideration.)

Graduate Studies

First steps to establish the Graduate School were also taken during the academic year of 1966-67. On March 28, 1967, the Board of Trustees authorized the President and the faculty to begin the process of developing graduate programs at the master's degree level to commence in the Fall quarter of 1968. In May 1967 the University Senate authorized further development of preliminary program proposals that had been submitted earlier by interested departments. On August 15, 1967, the Board of Trustees established the Office of the Dean of the Graduate School and authorized specific programs. Earl E. Edgar, Ph.D. in Philosophy was appointed the first Dean and the new school was headquartered in the Arts and Sciences Office Building (previously the Valley Park Motor Lodge -- purchased by the Youngstown Educational Foundation and leased to the university) at 521 Wick Avenue across the street from the Maag Library. The graduate programs were approved by the Ohio Board of Regents on December 15, 1967, and received preliminary accreditation by North Central Association in July 1968.

Included in the original group of 18 graduate programs were four leading to the Master of Science in Engineering degree, in civil, electrical, mechanical, and metallurgical engineering. The first version of these programs became known as the "traditional" option of the engineering programs, and continues to provide a student with the background necessary for acceptance into most doctoral programs in the particular discipline. Beginning in Fall quarter 1973, the four departments were authorized to add an "administrative" option to the programs in response to student interest. Completion of the "administrative" option, which incorporates certain courses from the School of Business Administration and the Department of Economics, is not intended to serve as a stepping stone to the Ph.D. degree, but rather to be terminal preparation for an individual seeking depth in his or her engineering specialty plus credentials for managerial positions. (A minimum of 45 quarter-hours credit are required for a master's degree. Graduate courses are numbered at the 900 and 1000 level, and are offered mostly in the evenings.)

Early in 1968, the Final Report: Goals of Engineering Education (Washington, D.C.: American Society for Engineering Education, January, l968) was released. This time the controversial recommendation expressed in the Preliminary Report (see page 37) that basic engineering education should be extended to include a master's degree, was tempered with the recommendation that ECPD (ABET) continue to focus accreditation activities on programs leading either to a bachelor's degree or to a master's degree, but not both in the same discipline at any given institution. (From 1972 until 1979, ECPD did accept applications to accredit both simultaneously, but reverted to the original practice under strong opposition from some of the professional societies.) In 1994, ABET reported that only 31 of 1,494 accredited engineering programs were accredited at the master's degree level; Youngstown State University has never sought the advanced level accreditation. The Final Goals Report cautioned that credit-hour requirements were making it too difficult for students to obtain a bachelor's degree in four years, and further recommended that institutions provide high-quality part-time degree programs and continuing education programs.

As related above, academic years 1965-66 through 1968-69 were extremely busy ones for the engineering school faculty during which they settled in a new building, experienced the conversion from the semester system to the quarter system of terms, and started master's degree programs. In retrospect, however, it was fortunate that the three events overlapped as they did; circumstances had provided the Dean and the faculty with opportunities to coordinate the undergraduate and graduate curricula and the equipment more effectively. It would take another

two to three years to incorporate the equipment in the laboratories and make adjustments in the courses so as to provide a smooth transition from the senior undergraduate level to the graduate level. Certain 800-level elective courses, to become known as "swing courses," were approved for graduate credit for use in cases where such advanced courses had not been taken by a master's degree candidate. (Swing courses carry the same undergraduate and graduate credit, but graduate students are required to complete additional assignments. The number of swing course credits that may be applied to a master's degree is limited.)

Overall, there was much progress. In l971, the School of Engineering was reaccredited by ECPD (ABET), with the day and evening programs in metallurgical engineering added to civil, electrical, and mechanical. Accreditation for chemical engineering would be acquired in 1974 and for industrial engineering in 1987. In 1976, chemical engineering also acquired accreditation by the American Institute of Chemical Engineers.

In April of 1987, Youngstown State University and The University of Akron entered into an agreement which allows engineers and students living and working in this area to take graduate courses beyond the master's degree as part of the Ph.D. degree program at Akron. A few students have expressed an interest in this path to doctoral study.

Youngstown State University was authorized to offer a doctoral program, its first, beginning in Fall quarter, 1992. The Department of Educational Administration offers a program in educational leadership leading to the Doctor of Education (Ed.D.) degree. The first two graduates received their degree in August, 1995.

The Northeastern Ohio Universities College of Medicine (NEOUCOM) was established under the sponsorship of a consortium formed in 1972 by Youngstown State University, Kent State University and The University of Akron. Students admitted into the NEOUCOM BS/MD program are able to complete their BS and MD degrees in as few as six years.

Engineering Technology

Again pursuing the protocol for gaining approval, President Pugsley established the Technical and Community College during academic year 1968-69. Nicholas Paraska, Ph.D., a member of the civil engineering faculty since Fall 1961, was named the first Dean. Headquartered in the Engineering Science Building, the new college introduced a total of 18 two-year programs leading to Associate in Arts, Associate in Business, and Associate in Applied Science degrees beginning Fall quarter 1969.

Prominent among the college subdivisions that prepared these first offerings was the Department of Engineering Technology. Consisting of three full-time engineering faculty (including Dean Paraska), and perhaps as many part-time, the department developed Associate in Applied Science degree (AAS) programs in civil, electrical, mechanical, and metallurgical engineering technology, and computer technology. The stated objective of the programs was to provide technical education to job-qualify individuals in two years. Approximately 100 quarter-hours credit are required for the degree.

The Technical and Community College grew rapidly and the engineering technology programs did as well. The associate degree program in electrical engineering technology was accredited by ECPD (ABET) in 1972; accreditation for the civil and mechanical programs would follow in 1976. Holders of accredited associate degrees were immediately certified as "Junior Engineering Technicians" by the Institute for the Certification of Engineering Technicians, and for membership in the American Society of Certified Engineering Technicians.

Beginning in Fall quarter 1973, the civil, electrical, and mechanical engineering technology programs were extended two years in length. Students completing the additional requirements (approximately 100 quarter-hours) are awarded a second degree, the Bachelor of Science in Applied Science (BSAS). This so-called "TWO-PLUS-TWO" concept remains in effect today for these disciplines. The three baccalaureate programs were accredited by ABET (ECPD) in 1982.

In 1975-76 the engineering technology department further expanded their offerings by introducing an associate degree program in Drafting and Design Technology and extending the Computer Technology program by two years. Also, a group of one-year certificate programs were added, which included such topics as:

Architectural/Mechanical Drafting Technology
Computer Technology
Electrical Power
Electronics
General Industrial Technology
Machine Design
Plant Engineering Technology
Tool Design
Urban Planning Technology

In 1976, the Technical and Community College was moved to Cushwa Hall and renamed College of Applied Science and Technology. The 1976-77 catalog gives a brief description of the facility as follows:

> "Opened in 1976, this new, $7.5 million structure houses the departments of the College of Applied Science and Technology as well as the Media Center, the Television Center, the Geography Department, and the Mathematics Department. One of the largest buildings on campus, it contains 52 classrooms, 70 laboratories, 169 offices, and 23 conference-seminar rooms in 191,000 square feet of floor space."

The Department of Engineering Technology was housed on the third floor, with laboratories for electric circuits and machines, electronics, physical measurements, civil engineering, pneumatics controls, and computers. The department also maintained a microprocessor laboratory in Meshel Hall.

Nationally, associate degree programs in engineering technology were being accredited by ECPD as early as 1946, but baccalaureate degree programs were not considered until 1967 when such programs appeared in increasing numbers. Proponents of the new type of engineering degree contended that most traditional engineering programs had become too theoretical since World War II and were neglecting skills formerly taught to engineers, such as drafting and manufacturing processes. Creators of the so-called Bachelor of Engineering Technology degree intended that holders of such a degree should occupy a middle ground between the craftsman and the engineer, and be titled "engineering technologist" rather than "engineer." Currently, ABET defines Engineering and Engineering Technology as follows: (12)

> "Engineering is the profession in which a knowledge of the mathematics and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind."
>
> "Engineering Technology is that part of the technological field that requires the application of scientific and engineering knowledge and methods combined

> with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer."

The engineering technology idea brought several concerns. How differently would industrial employers treat holders of the new degree? How would professional registration be affected? How would graduate schools receive such a credential? Should engineering and engineering technology programs be maintained separately at an institution? Would engineering technology students carry a "second-class" status?

These concerns have been reconciled with time. Initially, some engineering faculty were disturbed by the thought that they may not be satisfying the needs of industry ideally, but eventually came to realize that engineering technology was providing another career path for students. Many freshmen welcomed the engineering technology programs as being better suited to their needs without concern for status, and the engineering technology faculty took every opportunity to promote their programs. President Pugsley's decision to establish engineering technology under a separate faculty had provided autonomy for the program. The engineering school faculty was cooperative with regard to the use of laboratory facilities, but was also competitive for student enrollment.

Industrial employers brought to campus by the Office of Career Services have sought holders of engineering technology and/or engineering degrees (including the master's degree) to meet their particular needs. In the early 1970s, many employers indicated their intention to differentiate between engineering technologists and engineers in their job assignments. With time, however, some employers found it difficult to maintain a distinction as employees settled into their organization and were called upon to do the tasks at hand. The highly diverse and changing needs of industry have clouded the use of the word "engineer" in titles of positions, functions, and departments. Perhaps the only major distinction is in the starting salary, when the holder of a four-year engineering technology degree can expect about 10 percent less than the holder of a baccalaureate engineering degree.

In general, holders of engineering technology degrees are permitted to take the first examination leading to professional registration along with holders of engineering degrees; if passed, both are entitled to the status of "Engineer in Training." Normally, the holder of an ABET (ECPD) accredited engineering degree must acquire four years of engineering experience judged to be of a professional nature in order to take the (second) examination for full professional registration. However, the various state registration bodies vary on the experience requirement for holders of four-year ABET accredited Engineering technology degrees. Some states, including Ohio, require eight years of such experience before the second examination can be taken. Some states require as few as four years.

Holders of four-year ABET accredited engineering technology degrees who aspire to pursue a master's degree in engineering encounter a major problem. In order to gain acceptance as a degree candidate they are expected to bring their mathematical skills to the baccalaureate engineering level and to strengthen engineering course deficiencies which will enhance their potential for success.

Collective Bargaining

During the early 1970s, there occurred a major change in the faculty-administration relationship within the university. The changing of the guard in 1966 had resulted in some modifications regarding policies and practices on hiring, firing, salaries, promotions, teaching loads, etc., but the great majority of the faculty continued to have little or no input in the process. Salaries were among the lowest in the state, and teaching loads among the highest. In 1970, two

separate faculty incidents occurred where it became clear that reasons for dismissal or denial of promotion were not to be expected, and that there was no faculty appeals procedure through which grievances or appeals for such decisions could be filed. On another occasion, in the Fall of 1971, the president warned the faculty of possible retrenchment because of declining enrollment, but failed to present data in support of, or a plan to implement, such action. These conditions were of great concern to the campus community, and for some served to fuel the sense of protest against the establishment that had developed in 1969 when tensions over the Vietnam War ran high.

On April 5, 1971, about 20 faculty members formed the Youngstown State University Chapter of the Ohio Education Association (YSU-OEA) with the objective of organizing the entire faculty and becoming the exclusive bargaining agent. Their effort to develop met with objections and delays by the administration, a sluggishness on the part of some faculty to commit to unionization, and competition from the American Association of University Professors Chapter (AAUP) on campus. (As one example, many "engineering" faculty held unionization as being in conflict with their professional registration; yet some did not.)

Nevertheless, the YSU-OEA did its job very well, so that by January of 1972, about 40 percent of the 382 eligible faculty indicated support. Thereupon, the YSU-OEA petitioned the Board of Trustees for exclusive bargaining rights; the AAUP did likewise. By April of 1972, it became evident to the Board of Trustees that collective bargaining was inevitable, so they authorized two separate elections which were held in late May. At the first election, faculty voted "for" or "against" collective bargaining; 73 percent voted "for." The second election resulted in an OEA victory over the AAUP for exclusive bargaining rights.

In March, prior to the voting, the YSU-OEA was able (under court order) to obtain faculty salary records from the university, which were vital to preparations. Negotiations for the first contract began on August 7, 1972, with a tentative deadline for completion set for mid-January, 1973. However, shortly before the deadline, President Pugsley submitted his resignation to the Board of Trustees, citing personal reasons, and was succeeded immediately by John J. Coffelt, Ed.D.

A native of Neosho, Missouri, Dr. Coffelt served as Vice Chancellor for the Oklahoma State Regents for Higher Education from 1965 to 1968 prior to coming to Youngstown State University, where he was appointed Vice President for Administrative Affairs.

Negotiations were resumed about March 1, with lengthy controversial sessions on each contract issue. After about six weeks, tentative agreements, thought to show significant progress, were presented to the Board of Trustees. The Trustees rejected some of the concessions made by their bargaining team, resulting in increased tension. Finally, under threat of a faculty strike, the Trustees agreed to a contract, which was ratified by the faculty in late May, 1973. (It should be noted that administrators – including deans – and department chairpersons are not members of the YSU-OEA.)

From 1973 until 1992, the contract was renegotiated every two to three years, each occasion adversarial in nature and marked by varying degrees of controversy. Through it all, however, the overall quality of language and inclusions in the publication "YSU- OEA Agreement" improved as the participants learned more about the process. (Salary provisions, tenure, leaves of absence, workloads, faculty evaluation, promotion, grievance procedures, distinguished professor awards, election of chairpersons, etc. are all covered.) By the late 1980s, salaries improved to mid-range among the state colleges/universities in Ohio. Faculty workloads were stabilized in terms of work-hours credit rather than quarter-hours credit, and "productivity" calculated as student work hours. For lecture-type courses, work-hour credit is numerically equal to quarter-hour credit, but for some other teaching activities, work-hour credit is larger. For

example, a one quarter-hour credit laboratory course that meets three clock hours per week carries two work-hours credit for the faculty member. Such work load adjustments benefitted many academic units of the university, including "engineering."

Beginning early in 1993, the YSU-OEA and the administration have agreed to try a new approach to collective bargaining known as "mutual gains bargaining," which in essence strives to minimize adversarial situations through continuous open dialogue. Early reports are encouraging.

A reader interested in greater detail concerning the history of collective bargaining for the faculty at YSU is invited to consult publications 12 and 13 in the Bibliography, page 68. There are three other unions on campus covering classified employees, professional/administrative employees, and campus security personnel.

Changes in Administrative Personnel

Dean Michael Jean Charignon relinquished his position in June 1977 because of ill health, and was succeeded by George A. Sutton, Ph.D. A former RCAF pilot and retired Lieutenant Commander (USNR), Dr. Sutton began his academic career in 1949. He served on the faculty at the Universities of Florida and Arizona, and as chairman of mechanical engineering at the University of Nevada. From 1974 to 1976, he served as the Director of Professional Services for the National Council of Engineering Examiners.

Dean Nicholas Paraska retired in June 1982 and was succeeded by Victor A. Richley, Ph.D. A graduate of Youngstown University, Dr. Richley joined the electrical engineering faculty in 1957 and had served as the first chairman of the Department of Engineering Technology, beginning Fall quarter 1969. (Dr. Richley retired as Dean in December, 1990.)

President John J. Coffelt relinquished his position during the summer of 1983 because of ill health and Neil D. Humphrey, Ph.D., served as Acting President during academic year 1983-84 before being named President. A native of Idaho Falls, Idaho, Dr. Humphrey had served as President of the University of Alaska for a year prior to coming to Youngstown as Vice President for Financial Affairs from 1978 to 1980 and Executive Vice President from 1980 to 1983.

President Humphrey retired in June 1992 and was succeeded by Leslie H. Cochran, Ed.D. A native of Valparaiso, Indiana, President Cochran had served as Provost at Southeast Missouri State University from 1980 to 1992. From 1969 to 1980, Dr. Cochran served on the faculty at Central Michigan University where he also held various administrative assignments.

Dean George E. Sutton retired in June 1994 and his duties were delegated to Frank J. Tarantine, Ph.D., who served as Acting Dean while a national search for a candidate to fill the position was being conducted. A graduate of Youngstown University, Dr. Tarantine joined the mechanical engineering faculty in Fall quarter 1959 and was elected Chairman of the Department beginning Fall quarter 1992.

Effective Spring quarter 1995, Charles A. Stevens, Ph.D. in Mechanical Engineering, became Dean of the William Rayen College of Engineering and Technology. Dr. Stevens had been Dean, College of Science and Engineering Technology, University of Arkansas at Little Rock, from 1989 to 1995. Previously he served at Purdue University Calumet, Hammond, Indiana as Dean, School of Engineering, Management, and Technology from 1982 to 1985, and as Dean, School of Professional Studies from 1985 to 1989. Dr. Stevens had been active in several professional societies, notably the Technology Accreditation Commission of ABET.

Growth in Faculty and Campus Facilities

Statehood brought dramatic growth in faculty and campus facilities. Data given in the table below relate changes in the numbers of full-time faculty and in the numbers holding doctoral degrees and some limited information regarding the numbers of limited service (part-time) faculty. The academic years selected correspond with the first year in office for each president following Dr. Howard W. Jones.

Full-Time Faculty

Academic Year (President)	Entity	Total	Doctorates
1966-67	Total University	291	57
(Pugsley)	Engineering	25	7
1973-74	Total University	462	253
(Coffelt)	Engineering	34	28
	Engineering Technology	6	5
1983-84	Total University	469	285
(Humphrey)	Engineering	36	28
Engineering Technology	13	6	
1992-93	Total University	453	332
(Cochran)	Engineering	32	28
	Engineering Technology	15	6

Limited-Service Faculty

Academic Year	Entity	Total	
1966-67	Total University	404	
	Engineering	15	
1973-74	Total University	311	
Engineering	7		
	Engineering Technology	4	
1983-84	Total University	363	(2,176)
Engineering	6	(37)	
	Engineering Technology	16	(94)
1992-93	Total University	296	(1,764)
	Engineering	2	(11)
	Engineering Technology	9	(54)

Data for full-time faculty were obtained from the college catalogs; administrators with faculty rank are included. However, limited-service faculty were not listed in catalogs after 1973-74; data shown for 1983-84 and 1992-93 are estimates based on the total number (shown in parentheses) of quarter-hour credits taught by the faculty in Fall quarter as provided by the University Office of Institutional Research and Assessment. The author takes sole responsibility for estimating that, on the average, limited-service faculty taught six quarter-hours. (As mentioned previously, many limited-service faculty did not teach every term.) The most notable observation made from the table is the increasing percentage of full-time faculty holding doctoral degrees.

New building construction and the remodeling of existing structures has been a continuous process. Currently the campus covers about 125 acres and the university also owns more than 130 acres in Liberty and Hartford Townships (combined).

New buildings completed following the Engineering Science Building in 1968 include Williamson Hall in 1970; the Beeghly Physical Education Center in 1972; Bliss Hall, Cushwa Hall, and the William F. Maag Library in 1976; DeBartolo Hall in 1978; the All-Sports Complex in 1982 (with the first football game at Stambaugh Stadium being held on September 4); Meshel Hall in 1986; Lyden House in 1990; the John J. McDonough Museum of Art in 1991; and Cafaro House in 1994. Kilcawley Center, built in 1962, was enlarged and remodeled in 1974, 1976, and 1981. Other structures which have been remodeled include Tod Hall and Jones Hall in 1978; Williamson Hall in 1982; and Fedor Hall (purchased in 1965) in 1985. Among those currently being remodeled are the Engineering Science Building and Tod Hall. A recently launched campaign for the university entitled YSU 2000: A Vision for A Premier Metropolitan University promises a new College of Education building and an expansion of Stambaugh Stadium.

Enrollments

In Chapter IV (see page 30 and pages 32 to 43) enrollments for the total University and for the School of Engineering were discussed. We recall that enrollments reported for academic year 1966-67 were 12,033 and 1,521, respectively. Extending the discussion into the statehood era requires the inclusion of enrollments for the graduate school and for engineering technology. Except as noted [*], the following data were provided by the University Office of Institutional Research and Assessment.

Youngstown State University
Headcount Enrollment-Fall quarter

Year	University		Engineering		Engineering Tech
	UND	GRAD	UND	GRAD	UND
1968-69	13745	370	1476	54	
1969-70	14187	575	1434	76	343*
1970-71	14235	795	1285	84	487*
1971-72	13698	890	1031	NA	547*
1972-73	13017	971	806	51	470*
1973-74	12318	1140	773	48	485*
1974-75	12563	1354	783	58	595*
1975-76	13760	1813	922	81	743
1976-77	14043	1855	1055	73	902
1977-78	13872	1824	1161	71	938
1978-79	13501	2151	1230	65	1020
1979-80	13736	1567	1319	74	1147
1980-81	14340	1444	1407	63	1452
1981-82	14317	1347	1305	57	1542
1982-83	14433	1147	1274	39	1508
1983-84	14684	1165	1150	55	1525
1984-85	14182	1072	990	60	1342
1985-86	13889	1137	943	76	1169
1986-87	13811	1204	833	86	1052
1987-88	13521	1154	794	78	902
1988-89	13538	1172	742	58	804
1989-90	13647	1217	694	59	741
1990-91	14179	1275	694	61	702
1991-92	13819	1345	704	78	679

[*] Data provided by the engineering technology chairperson.

1992-93	13569	1237	685	64	652
1993-94	13295	1206	712	67	576
1994-95	12833	1146	685	57	581
1995-96	12162	1171	765	64	421

Pursuing the discussion started in Chapter IV, the undergraduate engineering enrollment again oscillated in accord with the reported national freshman enrollment. By 1973-74, the national freshman enrollment dropped an estimated 36 percent, from 80,000 to 51,000, and the local engineering enrollment dropped 49 percent, from 1,521 to 773. Several causes contributed to the decline. The United States became involved in the Vietnam War, beginning in March 1966. There occurred a dramatic decline in the number of engineers and scientists in aerospace and related industries after the moon landings had been accomplished in 1969. There was a high rate of inflation based on 1967 prices. Also, as with other steel producing areas, Youngstown was being adversely affected by competition from foreign countries who could make steel more cheaply. All told, the 49 percent decrease in engineering school enrollment exceeded one-third of the 36 percent decrease in national freshman enrollment. (Recall the hypothetical model, page 33.)

By 1980-81, the engineering school enrollment increased 82 percent, from 773 to 1,407, while the national freshman class size increased an estimated 106 percent, from 51,000 to 105,000. United States involvement in the Vietnam War ended in January 1973. (Veterans received educational benefits under the Veterans Pension and Readjustment Assistance Act of 1967.) National attention was being directed to energy conservation and new forms of energy, environmental problems, transportation systems, computer development, health care, national defense, and future space exploration. Locally, a temporary resurgence in demand for steel production in 1973 (when competing foreign steel prices increased) perhaps helped some. Publicity on the graduate and engineering technology programs was inspirational. Open house Technorama ‘73 had given high school students and their parents a view of the opportunities available at Youngstown State. The engineering school enrollment increased far more than one-third of the increase in national freshman enrollment.

The year 1977 marked the beginning of the end of the steel industry in the Mahoning Valley when Youngstown Sheet & Tube Company idled over 4,000 area steelworkers at its Campbell and Struthers Works. Then, in 1979, three more area mills announced closings which would mean the loss of nearly 5,000 more jobs: U. S. Steel Corporation’s Ohio Works and McDonald Mills, and Jones and Laughlin Steel Corporation’s Brier Hill Works. Similar closings were taking place in other steel producing areas. By 1983 an estimated 40 percent of all steelworkers in the country were unemployed, with workers in the Valley among the most affected.

During academic year 1979-80, the engineering programs were reaccredited by ECPD. It criticized the teaching loads of the engineering faculty as being too high to allow for research and professional development. However, President Coffelt had declared a moratorium on hiring of additional faculty out of concern for the potential effect of the steel mill closings. As a remedy for ECPD’s criticism, the president and the dean of engineering opted to upgrade the admission requirements and advise students who were adversely affected to enroll in the College of Arts and Sciences while correcting deficiencies. President Coffelt’s concern was justified, and for the engineering school there occurred a steady drop in enrollment until l988-89. Upgrading the admission requirements probably benefited the school in the long run, but the meaning of headcount enrollment for engineering became clouded in the process. All told, by 1994-95, the engineering enrollment declined 51 percent, from 1,407 to 685, as compared to an estimated decline of 19 percent in national freshman engineering enrollment, from 105,000 to 85,000. (13)

The enrollment headcount for engineering technology quadrupled during the 1970s, exceeded 1,500 during the period from 1981-82 to 1983-84, and then declined. Some of the recent decrease in enrollment is attributable to an administrative action in 1993 that combined the computer technology and the computer science programs to form the new Department of Computer and Information Sciences in the College of Arts and Sciences. Data available for engineering technology (two and four year programs combined) show a decline in national freshman enrollment between 1987-88 and 1994-95, from about 18,600 to 13,000. (14)

Cushwa Hall

A survey conducted in 1967 related strong interest in graduate study by engineering graduates who were living and working in the area. The response was gratifying, but participation by these students did not develop as rapidly as promised. On the other hand, graduate engineering enrollments during the early to mid-1970s included a greater number of international students than had been expected; at times they outnumbered the native-born students. (The welcome increase in the international student body across campus prompted the university to establish the International Student Office – now known as the Multicultural Student Services Office – in 1970.) The graduate engineering programs have also attracted graduates of many colleges and universities in this country. Both the “traditional” and the “administrative” options have been successful in fulfilling student needs. A good number of graduates have gone on to earn a doctorate.

When the university was a private institution, revenues were simply a matter of tuition and fees, supplemented by contributions. However, as a state university, income depends on the makeup of the student body. Students who are out-of-state residents pay a surcharge in addition to tuition and fees, and state subsidies are scaled to various categories of instruction. (Broad

categories include Graduate as the highest, followed by Baccalaureate, Technical, and General Studies. However, each of the broad categories is broken down into subcategories in such a fashion that there is some overlap in the subsidy rates.) Also, state subsidy is awarded on a full-time-equivalent (FTE) student basis, determined by dividing the total number of quarter-hours taken by all students in a given subsidy category by 15. Thus, the breakdown of full-time and part-time students in each category of instruction is a factor. Normally, the total FTE student count for the university is in the neighborhood of three-fourths of the total headcount. Headcount depicts the student traffic on campus, but much more must be known for budget purposes.

The cost of an education at Youngstown State University has been relatively low among the state colleges and universities. For academic year 1976-77, tuition and fees totaled $226 per quarter (for 12 to 16 credits); the out-of state surcharge was $200 per quarter. In 1986-87, the above dollar amounts were $445 and $325, respectively, for the same service. (The rates for undergraduate and graduate students, full- or part-time, had been the same.) For academic year 1995-96, undergraduate tuition and fees (for 12 to 15 credits) total $1,024 per quarter (slightly higher for graduate students). There were two out-of-state surcharge rates: $720 per quarter for students within a specified geographical region, $1,560 for students outside the region. Computer assisted courses carry a fee of $25; computer intensive courses carry a fee of $35.

More Student Organizations, Awards, and Scholarships

In 1973, the Engineering Technology Club, affiliated with the American Society of Certified Engineering Technicians, was established to promote beginning student interest in the engineering technician profession. Also in 1973, the Student Chapter of the American Institute of Chemical Engineers was started with the objective of promoting the professional development of its members and contributing to the growth of the Chemical Engineering Department at YSU. The Student Chapter of the American Institute of Industrial Engineers was established in 1974 to promote the profession of industrial engineering through study, research, and discussion of the field. In 1976, the Student Chapter of the Society of Women Engineers was started to bring together women engineering majors and promote awareness of their field of study. The Student Chapter of the American Society for Metals (established in 1949) became the Student Chapter of the American Society for Materials in 1983, with the purpose of keeping students interested in the field of metals and materials up-to-date on current developments in the field through contact with professionals. The Student Chapter of the Society of Automotive Engineers was established in 1994 to provide opportunities to gain broader insight into engineering, arrange field trips, and sponsor engineering projects. In 1995, the Student Chapter of the National Society of Black Engineers was initiated to promote black student awareness in all engineering fields and provide information on various opportunities for minority advancement.

Several new annual students awards were established: in 1971, the American Society of Metals Awards went to an outstanding senior and an outstanding junior in metallurgical engineering and in materials science, and to an outstanding student for leadership in ASM activities; in 1972, the American Society of Civil Engineers, Youngstown Branch, Award to the outstanding civil engineering technology graduate; also in 1972, the Mosure, Fok and Syrakis Co., Ltd., Award to the best civil engineering technology graduate who completed the degree requirements on a part-time basis while being employed full-time; in 1977, the American Society of Mechanical Engineers, Youngstown Section, Award to the outstanding mechanical engineering technology graduate; also in 1977, the Professor Luginbill Chemical Engineering Award to the best all-around senior in chemical engineering; and in 1985, the Ronald J. Hepp Memorial Fund Award to the electrical engineering student who is first in his or her graduating class.

Several more scholarships for "engineering" became available: the Dow Chemical Company Outstanding Junior Awards in 1967 (scholarships for students of chemical and mechanical engineering and materials science); ALCOA Foundation Scholarships in 1969 (to a junior or a senior in electrical engineering and in mechanical engineering); The National Electrical Contractors Association (Penn-Ohio Chapter) Scholarship in 1969 (to an electrical engineering technology student interested in a career in the electrical construction industry); The Builders Association of Eastern Ohio and Western Pennsylvania Scholarship in 1972 (to a freshman in civil engineering technology); The Electrical League of Eastern Ohio, Inc., Scholarships in 1974 (for students enrolled in electrical engineering or electrical engineering technology); The Diamond Shamrock Corporation Scholarships in 1975 (for outstanding students in chemical engineering); Department of Electrical Engineering Grant in 1976 (to a sophomore, junior, or senior electrical engineering student); Koppers Foundation Company Scholarships in 1979 (to outstanding students in chemical, electrical, or mechanical engineering); Remacor Scholarships given by the Penn-Ohio Chapter of the American Institute of Mining and Metallurgical Engineers in 1980 (to an outstanding junior materials engineering student); Nicholas Paraska Scholarship in 1982 (based on achievement and need to a freshman student majoring in one of the College of Applied Science and Technology programs); Youngstown State University (Educational) Foundation: Deans Scholarships in 1986 (96 scholarships awarded to 16 students in each of the six undergraduate college and schools); Michael A. Rigo Memorial Scholarship in 1986 (to a junior mechanical engineering student); The Gerhardt M. Stein Electrical Engineering Scholarship in 1988 (to an electrical engineering student); the Nicola and Rocchina Richley Memorial Award in 1990 (scholarship to a sophomore student of engineering or engineering technology); and the Edmund J. Salata Scholarship in 1991 (to a civil engineering student).

A reader interested in the current status of all of the student organizations, awards, and scholarships reported in this history should consult the Student Affairs Office at Kilcawley Center, the Financial Aid and Scholarships Office in Jones Hall, and the most recent university catalog.

Promotional Endeavors and Program Changes

There have been many promotional activities and program changes in the "engineering" experience during the past 20 years that have not been mentioned to this point in the writing. Some are included here. These events reflect an ever-present desire to better serve the needs of students and promote the university and the profession, as well as a necessary concern for enrollment, accreditation, productivity, and the budget.

During academic year 1982-83 the university celebrated the 75th anniversary of its 1908 founding date. To commemorate the event, the Diamond Jubilee Committee published a quarterly calendar (beginning with July 1982 and ending with June 1983) which cited important events in the history of the university that occurred on the various calendar dates, and included a segment of the school's history excerpted from the forthcoming university publication by Dr. Alvin W. Skardon, Professor of History (see bibliography 2). A major function during the year was a campus-wide open house held on Sunday, May 22, 1983, from noon until 6 p.m.

Annually during the week of February that includes George Washington's birthday (February 22) the National Society of Professional Engineers celebrates National Engineers Week, proclaiming some particular theme for the year. "Engineering" has supported Engineers Week through the efforts of the Mahoning Valley Society of Professional Engineers (MVSPE) and the Mahoning Valley Technical Societies Council (MVTSC). One annual event that is held at the university is a competition among local high schools known as "Math Counts," which was initiated by MVSPE in about 1982.

In 1978, Dean Sutton instituted an annual ceremony inducting engineering graduates into the Order of the Engineer. Inductees pledge to uphold the obligation of an engineer; they receive a ring to wear as a symbol of membership. The Order was established in the United States by OSPE in 1970, and patterned after the Order of the Ring in Canada.

Beginning in 1989, the School of Engineering, in cooperation with the Office of Career Services, has held a two-week program in July called Engineering EXPO '__ (where the last two numbers of the year appear in the blank space). The program is designed to give participants introductory hands-on experience with engineering projects, and thus a better understanding of what engineering and college life is all about. All of the engineering departments have participated in the instructional activities.

Beginning Fall quarter 1974, the Department of Chemical Engineering introduced a Nuclear Science and Engineering minor, which has been continued to the present. The Department of Industrial Engineering initiated a Management Engineering degree program in the Fall of 1976, but dropped it after three years due to lack of student interest.

During the decade of the 1970s, ECPD (ABET) recognized that undergraduate engineering curricula had perhaps become too science oriented, and moved to re-emphasize engineering design. Eventually, the accreditation criteria stipulated that curricula include one year of mathematics and science, one year of engineering science, one-half year of social science and humanities, and one-half year of engineering design. When identifying coursework to satisfy the 24 quarter-hours of engineering design credit, there seemed to be a consensus within the engineering school to resolve that the senior thesis be design oriented and so claim the six quarter-hours credit as being applicable. However, during the 1979-80 ABET accreditation visit, the inspectors judged, on review, that the content of some theses were not worthy of six quarter-hours of design credit, and warned against the use of thesis for any design credit. Thereafter, the senior thesis was phased out as a degree requirement in favor of design project-type courses.

Of all the "engineering" disciplines on campus, metallurgy has been the one most adversely affected by the slowdown and eventual closing of the steel mills. During 1969-70, the university offered four degree programs on metallurgy. In addition to the undergraduate and graduate programs offered by the Department of Metallurgical Engineering and the associate degree program by the Department of Engineering Technology, the Department of Chemistry continued a program leading to a Bachelor of Science degree with a major in metallurgy which was started in the 1930s. Enrollments were not large, but knowledge of metallurgy had been important in the Valley.

However, declining demand for metallurgy brought changes. By Fall quarter 1971, the Department of Chemistry discontinued its program; the Department of Engineering Technology would drop its program in the Fall of 1978. Effective Fall quarter 1971, the administration merged the Department of Metallurgical Engineering with the Department of Chemical Engineering. Reflecting effort on the part of the metallurgical engineering faculty to regain student interest by broadening the scope of their offering, the combined department was named Department of Chemical Engineering and Materials Science. The metallurgical engineering/materials science faculty continued to offer a high quality program, but lost ABET accreditation in 1982 when the number of faculty had been reduced to three because of low enrollment. The name of the master's degree program was changed from Metallurgy Engineering to Materials Science in 1972-73, but continues to offer a metallurgy option. The materials science programs (undergraduate and graduate) continue to struggle for enrollment, placing them in serious jeopardy. The loss of either of these programs would indeed be unfortunate. The availability of expertise on materials is essential to all "engineering" programs.

Financial Concern

By the early 1990s, there were several indicators which cautioned that financial matters were going to require serious attention. The State financial department was promising less support for the University's operation budget. It seemed that the University enrollment would bottom out, but the future was not clear. Higher salaries for most University employees had been negotiated several times during the years. A large number of faculty had been promoted to the academic rank of associate and full professor, thus enjoying higher salaries. The average age of the faculty (actually all employees) had increased to the point where healthcare insurance premiums were becoming an increased concern.

In the Summer of 1991, the YSU-OEA and the University entered into negotiations for the next contract term. As was the case in some previous negotiation sessions, the YSU-OEA proposed a faculty "buy-out," but some of the Trustees had philosophically opposed paying faculty to retire. On the other hand, younger faculty favored the idea, believing that their chances for salary increases would improve if higher-paid faculty would leave. This time, however, the University made a counter proposal, with minor differences, and both parties approved a "buy-out" to begin on January 1, 1992. Under the terms of the agreement, a full-service faculty member electing to retire would be awarded an additional five years of active service time when calculating his or her retirement benefits. The offer was well received and repeated for the next contract term. Similar "buy-out" offers were made to the classified employees.

By Fall of 1996, the faculty had been downsized as follows:

	1991-92	1996-97	Percent
Total University	463	403	12.9
Holding Doctorates	334	311	6.9
Engineering	34	26	23.5
Holding Doctorates	30	26	13.3
Technology	16	8	50.0
Holding Doctorates	6	2	66.7

The good news is that a substantial number of the retirees remained available to fill in on a limited-service basis in critical academic areas. Certainly, a Ph.D. is an asset to teach Technology, but not considered to be necessary.

The "buy-out" method of coping with the impending financial crisis was preferable to any other which might result in the arbitrary loss of positions termed "retrencement." The decision to retire was at the sole discretion of the faculty member, but this was not without problems. The untimely loss of key faculty, particularly in a small department, could seriously disrupt course offerings and, in some cases, student graduation. Because the administration would naturally feel it counterproductive to replace faculty immediately, a return to normal might take considerable time.

The administration also utilized a variety of other ways to conserve finances. Operation budgets were reduced and, in some cases, centralized. Requests for new equipment or any other expenditures required detailed justification. Funding for limited service faculty was held to a minimum, and proposed summer class schedules were scrutinized carefully. Also, where practical, programs were reorganized to share leadership and secretaries.

CHAPTER VI

2008

Recent Program Changes

Effective in Fall 1993, the administration relocated the Department of Engineering Technology from Cushwa Hall to the Engineering Science Building and united it with the William Rayen School of Engineering, resulting in a name change to William Rayen College of Engineering and Technology. Within the College, the Department of Engineering Technology was named School of Technology.

In 1997, the Departments of Civil and Environmental Engineering and Chemical Engineering were combined to be Civil/Environmental and Chemical Engineering. Electrical Engineering was renamed Electrical and Computer Engineering. Mechanical Engineering and Industrial Systems Engineering were joined to become Mechanical and Industrial Engineering. Materials Engineering was discontinued, but a few courses are still offered to service other engineering programs. The program options for the School of Technology were Civil and Construction, Electrical and Utility, Drafting and Design, and Mechanical Technology.

Degree and curriculum offerings for engineering included the Bachelor of Engineering (BE) degree in Civil and Environmental, Chemical, Electrical and Computer, Industrial Systems, and Mechanical Engineering. Graduate-level study leading to the Master of Science (MS) degree is available in all of these areas.

The Master of Science program may be characterized as being both career-oriented and self-directed, and offers considerable flexibility to suit the needs of individual students. The basic requirements for the degree include core courses, technical concentration, and electives, including thesis. In consultation with an adviser, a student may pursue a traditional tract (thesis recommended) in preparation for further graduate study, perhaps to a doctorate. A student seeking to prepare for a managerial role in industry may substitute certain business courses for technical courses. As a third option, the student may define a personal professional goal.

In 1998-99 the College instituted a Cooperative Education (Co-Op) Option, designed to assist students in getting meaningful engineering experience while pursuing their education. The Departments of Civil, Electrical, Industrial, and Mechanical Engineering participate in the option. The College also participates in research and training programs through the Department of University Outreach.

The Co-Op Option was the first attempt to place a student with an employment opportunity. So far as cooperating with industry, however, there had been a long-standing policy of trying to mesh class schedules with employee work hours. Especially during the 1940s and 1950s, when part-time student enrollment was as high as a third of the total (see page 35), there were many classes scheduled in the evenings. Also, it was not uncommon to honor the request for a conference course to enable a student to graduate.

Technology offerings included two-year study leading to the Associate in Applied Science (AAS) in Civil, Electrical, Mechanical, and Drafting and Design Technology. With two additional years of study in Civil, Electrical, or Mechanical Technology, a student can earn a Bachelor of Science in Applied Science (BSAS) degree. In 2003, the Associate in Technical

Study (ATS) degree was instituted, and curricula were introduced for Construction, Electric Utility, and Power Plant Technology.

In 2001, the University changed from the quarter system to the semester system of academic terms, with Fall, Spring, and Summer semesters. This entailed a complete review of all curricula, and a change in the course numbering system.

Each course is identified by an assigned prefix followed by a four digit number which is selected from the following schedule:

1500-1599	Freshman course
2600-2699	Sophomore course
3700-3799	Junior course
4800-4899	Senior course
5800-5899	Swing course (senior course also approved for graduate credit)
6900-	Graduate course
8100-	Doctoral course

For example, the course MECH 603 - Thermodynamics I - 4 quarter hours - became MECH 2603 - Thermodynamics I - 3 semester hours. In most cases the second digit was a carryover from the quarter system of numbering.

Semester terms also brought a review and modification of the General Education Requirements (GER) for graduation (see page 35). The new model consists of two broad areas: Basic Skills and Knowledge Domains. Courses applicable are listed under subheadings. Basic Skills include courses in Writing, Speaking, Critical Thinking, and Mathematics. Under Knowledge Domains are Natural Sciences, Artistic and Literary Perceptions, Societies and Institutions, Personal and Social Responsibilities, Selected Topics, Interdisciplinary, and Captions. Undergraduate students pursuing a bachelor's degree must complete 15 GER courses and students seeking an associate's degree must complete six.

Beginning in Fall 2007, an administrative reorganization combined departments from the College of Arts and Sciences with the College of Engineering and Technology to establish the College of Science, Technology, Engineering, and Mathematics (STEM). Listed alphabetically, they are:

Department of Biological Sciences
Department of Chemistry
Department of Civil/Environmental and Chemical Engineering
Department of Computer Science and Information Systems
Department of Electrical and Computer Engineering
Department of Engineering Technology
Department of Geological and Environmental Science
Department of Mechanical and Industrial Engineering
Departments of Mathematics and Statistics
Department of Physics and Astronomy

The College of Arts and Science was renamed the College of Liberal Arts and Social Sciences. The office of the Dean of the College of STEM is located in Moser Hall (the Engineering Science Building).

Historical Reflections

From the beginning in 1888 – when the first class was recorded – until 1916, classes and lectures were offered by the YMCA School. In 1916, the name was changed to the Association

School and in 1920 to the Youngstown Institute of Technology. In 1931, 1955, and 1967, the institution became Youngstown College, Youngstown University, and now Youngstown State University. However, none of these dates correspond with the year 1908, which is considered the year when the university was founded. Actually, it is the year when the first known college-level course was offered by the Law School, the school that unfortunately had to be discontinued in 1956 because of low enrollment.

It is interesting to recall that beginning in 1944, Engineering, Mathematics, and Physics were housed in the William Rayen Building under the authority of the first dean of engineering. By 1950, the total number of full-service faculty in the three areas was still less than 20, with a like number of part-time faculty available. The group worked well together during the period of returning war veterans. Mathematics and Physics were transferred to the School of Arts and Sciences in 1953 and 1960, respectively.

In 1967, President Pugsley sought to preserve the autonomy of Technology by housing them in the College of Applied Science and Technology (CAST). In 1993, 26 years later, Technology was merged with Engineering. Cushwa Hall became the home of the College of Health and Human Services.

In 1967, the system of academic terms was changed from semester to quarter. It seemed appropriate to follow the majority of the State-supported universities. At that time, faculty who had worked under President Jones for about 35 years were retiring, and new faculty would be seeking a voice. In the later 1990s, an ever increasing number of discussions occurred on the merits of returning to the semester system. After listening to all the arguments, pro and con, of the option, per say, the University community considered what might be accomplished for the University if the change was made. Effective in 2000-2001, the semester system was adopted, and the University entered the 21st century with renewed enthusiasm and optimism. The bulletins and other promotional materials related increased emphasis on career opportunities available in the various programs. Trends regarding health care, computer applications, etc. were addressed, and all innovations would support the administrative concept of "reaching out" to the community.

Degrees Granted

Appendix F lists the names of graduates, the degree(s) each earned and the calendar year during which the degree was granted. The listing terminates with Summer 2007. A tally of the list reveals totals as shown below:

Degree	Year Initiated	Title of Degree	Total
BA	1930-31	Bachelor of Arts	4
BS	1937-38	Bachelor of Science	15
BE	1944-45	Bachelor of Engineering	6,604
MS	1969-70	Master of Science	791
AAS	1969-70	Associate in Applied Science	2,905
BSAS	1973-74	Bachelor of Science in Applied Science	2,292
ATS	2003-04	Associate in Technical Study	81

Total 12,692

The tally also reveals that 1,507 of the degrees were the second or, in a few cases, the third degree earned by students. Thus, the number of "engineering" alumni may be determined to be (12,692-1,507) 11,085.

Recent Facility Additions and Changes

In 1995-96, the Engineering Science Building underwent a $6.873 million renovation project to enhance offices and classrooms, upgrade computer facilities with state-of-the-art technology and equipment, and modernize the 208 seat auditorium to a 21st century classroom facility.

During the renovation period, the College was relocated to the Phelps Building at the corner of Lincoln Avenue and Phelps Street across from Williamson Hall. In 2001, the Engineering Science Building was renamed Moser Hall in appreciation of a gift of $1.5 million from an alumnus, Danial H. Moser, who earned a BE degree in Mechanical Engineering in 1955.

In 1998, the $14 million Beeghly Hall was completed, and the School of Education was renamed Beeghly School of Education. The building is situated between Lincoln Avenue on the north and Rayen Avenue on the south.

In 1999, Stambaugh Stadium was renovated to include east-side bleachers, which increased the total seating capacity from 16,000 to 20,630.

Also in 1999, the College of Health and Human Services was renamed The Dr. Dominic A. and Helen M. Bitonte College of Health and Human Services.

Several opportunities for student housing have been developed. The Lyden House and the Cafaro House Honors Residence became available in 1990 and 1995. Both of these houses sit to the north along Madison Avenue. The University Courtyard Apartments (privately owned) in the Wick Oval area began operating in 2003.

In 2005, the $12.1 million Andrews Recreation and Wellness Center, a state-of-the-art multipurpose physical fitness facility, was completed. The building sits just north of DeBartolo Hall.

Computer Facilities

Engineering and Technology operate a Computer Complex made up of 140 PC Computers. The oldest of these machines is a Pentium III-1.8 GHz machine while the latest machines are Pentium IV-3.6 GHz machines. All machines are networked in the College via a 10/100 Ethernet, while connectivity to the University hub is via a fiber-optic backbone operating at 622 MB ATM. Full high-speed access to the Internet is available by this network to each computer. The College server provides storage space and e-mail service to all students.

Software available at the desktop in the College is made up of certain core packages while various machines have a different set of more specific software available. All machines have Microsoft Office available. Specific software available in the complex for more specialized applications include Autocad 2007, Solid Works, Autocad Inventor Ii, Algor FEA, ChemCad 5.6, Pspice 8.0, Working Model, Mechanical Desktop, Flient 6.3, STADD.Pro. HVAC 4.31, Minilab r14, Arena, MS Visual Studio, Microsoft Visual Basic 6.0 SP6, Labview 8.2, SPSS 15, Mathcad, Multisim 9, Matlab and Simulink R2006b, Maxima 5.11, OrCad 15.7, and Microsin among others.

Printing is available in the complex at no charge to the student. Laser black and white and high-speed color printers are available at each desktop.

The Computer Complex is made up of seven rooms, which, in some cases, are physically interconnected. Five of the seven rooms are equipped with computer projectors and visual

presenters to make an excellent environment for students to learn computing skills. Three of these rooms have computers for the students to follow along with the instructor. One room (ESB 2400) has advanced capability and is used for most of the student presentations in the College. It is equipped with a high-end computer connected to the Internet, a high resolution Visual Presenter, VCR and Slide input, cable TV, and satellite input. The room is equipped with an 8-feet-tall back-lit projection screen, which can display all of the room's inputs. Also available for output display are four 30-inch TV monitors.

Lab assistants are available at all times when the complex is open, and students may gain access at all times, 24 hours a day.

The University Computer Center is located on the fourth floor of Meshel Hall. To learn the particulars of the mainframe computer and its auxiliaries, review the article "Computer Center" in a recent University Bulletin.

Personal computers are available on campus for instruction and research. Currently, more than 55 labs are available within the 14 campus buildings and Metropolitan College sites. Networked personal computers allow access to local software, as well as the other facilities on campus, such as Maag Library and the Internet sites worldwide. The Electronic Campus provides faculty, staff, and students the opportunity to use global and local computer networks and current generation computer hardware and software via state-of-the-art network infrastructure.

Update on Student Awards and Scholarships

Awards not previously related are: the American Institute of Chemical Engineers Award, to the best chemical engineering student; the American Institute of Chemists Foundation Award, to the graduating senior with the highest grade point average (GPA) in chemistry and chemical engineering courses; the Cochran Diversity Fund in Engineering, awarded to a minority student in the College of Engineering; the Institute of Electrical and Electronic Engineers, Youngstown Section Award, to the outstanding graduate in electrical engineering; the Institute of Industrial Engineers, Youngstown Section Award, to the outstanding graduating industrial and systems engineering student; and the Omega Chi Epsilon Award, to the outstanding senior in chemical engineering.

Scholarships awarded include: the Ferdinand S. Jagatich Scholarship (1998), to a student majoring in mathematics, physics, or engineering with a 2.5 GPA and need; the Lenora and Jack Reed, and Pete Fabek Memorial Scholarship (1991), to a sophomore electrical engineering student and need; the Myron C. Wick, Jr. Scholarship (1985), two in the physical sciences and one in engineering (Recipients must be full-time students with 70 semester hours and a GPA of 3.0); the Ohio Aerospace Scholarships, to one outstanding junior and one outstanding senior in engineering; the Ohio Contractors Hall of Fame Scholarship, to a U.S. (Ohio resident preferred) upper-division student enrolled in a BE or BSAS program in civil engineering; the Robert E. Heltzel, Sr. Memorial Scholarship, to a sophomore engineering student residing in the local five-county area having a GPA of 3.5 and need; the Samantha Grace Pancoe Memorial Scholarship, to an engineering student (female preferred) with a GPA of 2.5 and an interest in product design and product safety; the Jack W. Guffey, Jr. and Monogue Scholarship, to a student (preferably in the College of Engineering) from New Springfield High School; the Paul J. Powers Scholarship, to an upper division student (mechanical engineering preferred) with a GPA of 3.0, or better; the Theodore J. Stitt Memorial Scholarship, to an upper-division civil engineering student residing in the local five-county area (Lawrence County preferred) with a GPA of 2.5; the Virgil A. Hobart Scholarship, to an engineering student based on need and merit; and the Adiaka and Associates Scholarships (1986), three partial scholarships to senior-level civil and structural engineering

students, and two partial scholarships to computer information system students (all must show need).

Student Tuition and Fees

The annual University catalogues show an elaborate listing of student tuition and fees. Only tuition costs for full-time enrollment are shown here. Out of state students from a defined regional area pay a regional surcharge. Students from more remote areas pay a higher non-regional surcharge.

For 1996, costs are listed as

Undergraduate (12-18 sem. hrs.)	$906	per sem.
Regional Surcharge	540	per sem.
Non-Regional Surcharge	1,212	per sem.
Graduate (12-18 sem. hrs.)	996	per sem.
Regional Surcharge	588	per sem.
Non-Regional Sutcharge	1,104	per sem.

In 2006, costs became

Undergraduate (12-16 qtr. hrs.)	$2,682	per qtr.
Regional Surcharge	1,523	per qtr.
Non-Regional Surcharge	1,307	per qtr.
Graduate (12-16 qtr. hrs.)	3,439	per qtr.
Regional Surcharge	2,931	per qtr.
Non-Regional Surcharge	2,754	per qtr.

In addition, a General Fee is charged each term, and fees for laboratory and computer use are assessed where applicable. The annual cost for room and board was increased from $4,200 in 1996 to $6,490 in 2006.

In spite of the increases indicated above, Youngstown State University is still among the least expensive universities in the State of Ohio.

Administrators

President Leslie H. Cochran resigned in June 2000 and was succeeded by David C. Sweet, Ph.D. Dr. Sweet had been Chairman if the Ohio Board of Regents Urban University Program since 1980. Beginning in 1978, he also served as Dean of the Lewis College of Urban Affairs at Cleveland State University. Dr. Sweet's experience with urban affairs is statewide.

Dr. Charles A. Stevens, Dean of Engineering, retired in June 2001, and Dr. Cynthia S. Hirtzel was his successor. Previously, Dr. Hirtzel was Provost and Vice President for academic Affairs at State University of New York (SUNY). From 1995 to 1998, she was Dean of the College of Engineering at Temple University. Dr. Hirtzel was Chairman, Department of Chemical Engineering and Material Science at Syracuse University from 1990 to 1995.

Dean Hirtzel stepped down in June 2007, and Martin A. Abraham, Ph.D., became Dean of the College of Science, Technology, Engineering, and Mathematics. A chemical engineer, Dr. Abraham holds a BS degree from Rensselaer Polytechnic Institute and his doctorate from the University of Delaware. He has an outstanding record of teaching, research, and publications at the University of Tulsa, and again, most recently, at the University of Toledo where he served as Dean of Graduate Studies.

Faculty Activities

Faculty performance is evaluated annually and when faculty members are being considered for promotion, tenure, or perhaps distinguished professor awards. Activities are evaluated in three areas: teaching, scholarship, and University service. The process is clearly delineated in the "YSU-OEA Agreement."

Teaching has always been considered to be a main mission of the University. There have been many individuals who published and participated in research. They were praised and rewarded appropriately, but the University is not known as a place where faculty "publish or perish." In fact, it is a matter of pride that students see mainly seasoned teachers in class. Very few graduate assistants teach.

As the University's reputation has grown, so has the frequency with which grants have become available. In the past eras, the Engineering School received an occasional grant. In the past 10 years, the occasions have become increasingly more frequent.

Closing Comments

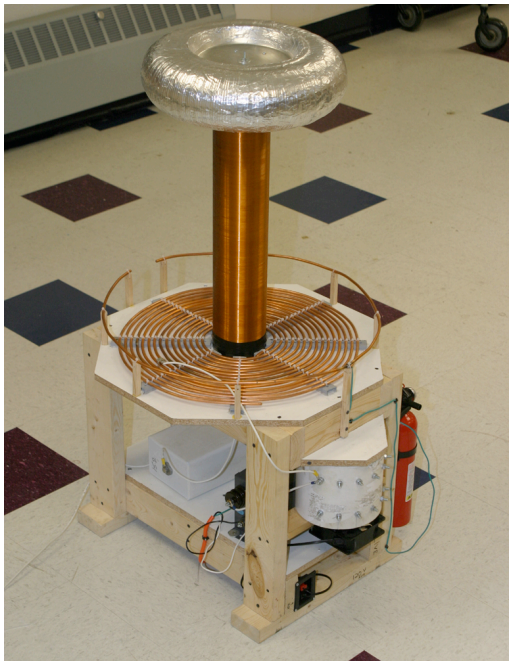
In the later 1880s, the local YMCA began teaching classes to help young men succeed. The educational program grew in scope to accommodate increasing opportunities in technology, business, etc., but the most significant expansion in the next 20 years was starting the (now defunct) Law School in 1908, the event that established the founding of this university. Currently, Youngstown State University offers nearly 200 accredited academic programs.

The beautiful campus covers an area of about 150 acres, consists of 43 buildings, and benefits from several area arts and cultural venues such as the Butler Institute of American Art, the Arms Family Museum of Local History, and the Museum of Industry and Labor. The University also owns 16.3 acres in Liberty Township and 118.4 acres in Hartford Township.

The history of development is truly a marvelous success story that relates an ever-present desire to serve the needs of students. Hundreds of individuals have played a role in various capacities, and the University claims more than 85,000 alumni.

Classes in "engineering" were offered from the beginning, but curricula leading to a degree were not offered until the early 1930s. The evolution of "engineering" on campus relates advancements in technology and the growth of a dynamic profession. Enrollments have been affected several times by wars, the demand and supply of engineers and technologists, and economic conditions. Yet, overall progress regarding programs and facilities has always been positive. Currently, all academic programs in Engineering and Technology in the College of Science, Technology, Engineering, and Mathematics (STEM) are accredited. The College is housed in Moser Hall, a modern five-story structure built in 1968 and remodeled in 1996. Since the mid-1930s, 12,692 degrees have been awarded to 11,085 "engineering" alumni.

The College of STEM is committed to furthering the mission of the University by providing quality programs in engineering and technology which encompass the mathematics and physical sciences, engineering sciences, social sciences, business, and the humanities. Applications of these fundamentals prepare students for careers in both engineering and engineering-related fields, educate students for living more abundantly, advance technology and support, as well as challenge industry and government both locally and nationally through research and public service integrated with teaching.



"Engineers" at Work

BIBLIOGRAPHY

No. Publication

1. "On Doing Local History: Reflections on What Local Historians Do, Why, and What It Means," by Carol Kammen, published by the American Association for State and Local History, Nashville, Tenn., 1986.
2. "Steel Valley University: The Origin of Youngstown State," by Dr. Alvin W. Scardin, Professor of Urban History, published by Youngstown State University, l983.
3. "A Heritage To Share: The Bicentennial History of Mahoning County, Ohio," by Howard C. Aley, published by the Bicentennial Commission of Youngstown and Mahoning County, Ohio, l975.
4. "Engineers and Their Profession," 3rd ed., by John Dustin Kemper, published by Holt, Rinehart, and Winston, New York, NY, l982.
5. "l992 ABET Accreditation Yearbook," published by the Accreditation Board for Engineering and Technology, Inc., New York, NY.
6. "62nd Annual Report," Accreditation Board for Engineering and Technology, Inc., New York, NY, September 1994.
7. "Youngstown Ohio," created and produced for the Youngstown Area Chamber of Commerce by Windsor Publications, Chicago, Ill., l968.
8. "Mahoning Valley Society of Professional Engineers Membership Directory: l990-l991," published by the Mahoning Valley Society of Professional Engineers, Youngstown, Ohio.
9. "The College Blue Book," 24th ed., published by Macmillan Publishing Co., New York, NY, l993.
10. Youngstown College/Youngstown University/Youngstown State University Catalogs: 1930-31 to 1995-96, with none published for l943-44. The catalog for l930-31 is listed as the Fourth Annual Catalog; the University Library does not have the first three. 2003-05.
11. The World Book Encyclopedia, by Field Enterprises Educational Corporation, Chicago, Ill., l966 plus yearly supplements.
12. "The Youngstown State University OEA Chapter: An Association Story," prepared by Geoffrey Sill, July 1973 and revised by Stephen Hanzely, November 1973.
13. "Interested-Based Collective Bargaining at Youngstown State University: An Oral History," by Patrick W. Carlton, Virginia Tech, Blackstone, Virginia, Oct., 1994.
14. The Neon, published annually from 1935 to 1992. The publication was started in 1931 and known as The Wye-Collegian in 1931 and 1932. In 1933 it was called The Hourglass, and in 1934 The Beacon.
15. Youngstown State University Bulletin: Graduate Catalog Issue, published annually beginning 1968-69.

REFERENCE NOTES

No. Source

1. Youngstown Vindicator, September 10, 1890. (As per Bibliography Publication No. 2, pages 31 and 32.)
2. Youngstown Vindicator, August 17, 1916. (As per Bibliography Publication No. 2, pages 53 and 54.)
3. See Bibliography Publication No. 6, pages 2, 3, 47, and 62.
4. Youngstown Vindicator, December 5, 1954.
5. Youngstown Vindicator, November 13, 1949.
6. Youngstown Vindicator, December 5, 1954.
7. The statistics are based on the report of President Howard Jones to the Board of Trustees for Fall term (up to 1966). (As per Bibliography Publication No. 2, page 199.)
8. Youngstown Vindicator, November 16, 1958.
9. The Jambar, Volume 33, No. 8, May 9, 1958.
10. Source: H. Folk, "The Shortage of Scientists and Engineers," Lexington, Mass.: D. C. Heath, 1970. Data after 1966 from Engineering Manpower Commission, New York, NY. (As per Bibliography Publication No. 4, page 104.)
11. Youngstown Vindicator, February 15, 1973.
12. See Bibliography Publication No. 5, back cover.
13. Annual publication "Engineering and Technology Involvement," by Engineering Manpower Commission (EMC), American Association of Engineering Societies (AAES), NY.
14. ibid

EXHIBIT I

Chapter 4733-35: Ohio Revised Code
(Effective 10/15/70; Section 4733-35-06 Revised 11/1/78)

Code of Ethics for Engineers and Surveyors

4733-35-01: Preamble

In order to safeguard the life, health, property and welfare of the public and the state of Ohio, to maintain integrity and high standards of skills and practice in the profession of Engineering and Surveying, the following rules of professional conduct, promulgated in accordance with chapter 4733 of the Ohio Revised Code, shall be binding upon every person holding a certificate of registration as a Professional Engineer or as a Surveyor.

The Engineer or Surveyor, who holds a certificate of registration from the Ohio State Board of Registration for Professional Engineers and Surveyors, is charged with having knowledge of the existence of reasonable rules and regulations hereinafter provided for his professional conduct as an Engineer or Surveyor, and also shall be deemed to be familiar with their several provisions and to understand them. Such knowledge shall encompass the understanding that the practice of engineering, or of surveying, is a privilege, as opposed to a right, and the registrant shall be forthright and candid in his statements or written responses to the Board or its representatives on matters pertaining to professional conduct.

4733-35-02: Integrity

The Engineer or Surveyor is obligated to act with complete integrity in professional matters for each client or employer as a faithful agent or trustee, shall be honest and impartial, and shall serve the public, his client and his employer with devotion.

4733-35-03: Responsibility to the Public

The Engineer or Surveyor shall:

(A) Protect the safety, health and welfare of the public in the performance of his professional duties. Should the case arise where the Engineer or Surveyor faces a situation where the safety, health or welfare of the public is not protected, he shall:

(1) Sever his relationship with his employer or client;

(2) Refuse to accept responsibility for the design, report or statement involved;

(3) Notify the proper authority if, in his opinion, the situation is sufficiently important.

(B) Undertake to perform assignments only when he and/or his consulting support are qualified by training and experience in the specific technical fields involved. In the event a question arises as to the competence of an Engineer or Surveyor to perform an engineering or surveying assignment in a specific technical field of engineering or surveying which cannot be otherwise resolved to the Board's satisfaction, the Board, either upon request of the Engineer or Surveyor or by its own volition, may require him to submit to an appropriate inquiry by or on behalf of the Board;

(C) Be completely objective in any professional report, statement or testimony. He shall include all relevant and pertinent information in the report, statement or testimony when the result of the omission would, or reasonably could, lead to fallacious conclusion;

(D) Express an opinion as a technical or expert witness before any court, commission or other tribunal, only when it is founded upon adequate knowledge of the facts in issue, upon a

background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of his testimony.

4733-35-04: Public Statements

(A) The Engineer or Surveyor will issue no statements, criticisms or arguments on engineering or surveying matters connected with public policy which are inspired or paid for by an interested party, or parties, unless he has prefaced his remarks by explicitly identifying himself, by disclosing the identities of the party, or parties, on whose behalf he is speaking, and by revealing the existence of any pecuniary interest he may have in the instant matters.

(B) He will publicly express no opinion on an engineering or surveying subject unless it is founded upon subsequent knowledge of the facts of an issue, upon a background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of his testimony.

4733-35-05: Conflict of Interest

(A) The Engineer or Surveyor shall conscientiously avoid conflict of interest with employer or client, but, when unavoidable, the Engineer or Surveyor shall forthwith disclose the circumstances to his employer or client.

(B) The Engineer or Surveyor shall promptly inform his client or employer of any business association which could influence his judgement or the quality of his services to his client or employer.

(C) The Engineer or Surveyor shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties or their duly authorized agents.

(D) The Engineer or Surveyor shall not solicit or accept financial or other valuable considerations from material or equipment suppliers for specifying their products.

(E) The Engineer or Surveyor shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents or other parties dealing with his client or employer in connection with work for which he is responsible.

(F) As an elected, retained or employed public official, an Engineer or a Surveyor (in his capacity as a public official) shall not review or approve work that was performed by himself, or under his direction, on behalf of another employer or client.

4733-35-06: Solicitation of Employment

(A) The Engineer or Surveyor shall not pay, solicit nor offer, directly or indirectly, any bribe or commission for professional employment with the exception of his payment of the usual commission for securing salaried positions through licensed employment agencies.

(B) The Engineer or Surveyor shall seek professional employment on the basis of qualification and competence for proper accomplishment of the work. An Engineer or Surveyor may submit proposed fee information prior to selection.

(C) The Engineer or Surveyor shall not falsify or permit misrepresentation of his, or his associates', academic or professional qualifications. He shall not misrepresent or exaggerate his degree of responsibility in or for the subject matter of prior assignments.

(D) Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint-ventures, or his or their past accomplishments with the intent and purpose of enhancing his qualifications and his work.

4733-35-07: Improper Conduct

(A) The Engineer or Surveyor shall not sign and/or seal professional work for which he does not have personal knowledge and direct supervisory control and responsibility.
(B) The Engineer or Surveyor shall not knowingly associate with, or permit the use of his name or firm name in, a business venture by any person or firm which he knows, or has reason to believe, is engaging in business or professional practices of a fraudulent or dishonest nature.
(C) If the Engineer or Surveyor has knowledge or reason to believe that another person or firm is guilty of violating any of the provisions of Chapter 4733, Ohio Revised Code, or any of these Rules of Professional Conduct, he shall present this information to the Board in writing.

4733-35-08: Other Jurisdiction

Conviction of a felony without restoration of civil rights, or the revocation or suspension of a Professional Engineer's or Surveyor's license by another jurisdiction, if for cause which in the State of Ohio would constitute a violation of Ohio Statute 4733 or of these Rules, shall be grounds for a charge of violation of these Rules.

EXHIBIT II

Description: Interior of Applied Science Building

The ground floor of the engineering building is devoted to laboratories of mechanics and heat. Equipment includes a 400,000-pound Olson testing machine, a variety of machine tools, such as drills, shapers, saws, etc., fans and compressors, steam engines and pumps, and an ample supply of gauges, tubes, and other equipment.

The college has three electrical laboratories, two of which are located on the second floor of the engineering building. The equipment is such that the college is enabled to offer a broad program of practical electrical experimentation. A five-kilowatt motor-generator set, for example, has two interchangeable armatures for extending the range of electrical principles which may be studied with it. It may also be driven by a separate slip-ring induction motor, rather than by its own synchronous motor. Transformers, including those designed for phase transformation, single-, two-, and three-phase motors up to 20 H. P., and meters, controllers, reactors, etc. are included to make possible a large variety of theoretical and practical experiments. The third laboratory is located on the third floor and is used for electronic experimentation. The equipment consists of various representative vacuum, gaseous, and vapor tubes. Cathode ray oscillograph is available for the study of waveforms. The laboratory is well equipped with loading and adjustable resistors, condensers, and inductors. Meters are available for precision measurement.

Reference: Youngstown College Catalog for l944-45 and l945-46 (a single catalog). The catalog for l942-43 describes the ground floor and second floor laboratories as above, and also two laboratories used in flight training as part of the Civilian Pilot Training Program. No catalog was published for l943-44.

EXHIBIT III

Description: Interior of William Rayen School of Engineering

The William Rayen School of Engineering was made available to Youngstown College in January, l946. This building now accommodates the classes in mathematics, physics, and engineering.

The basement in the rear of the building consists of two large rooms, 68 by 32 feet. One of these is used for housing some of the power-generating equipment and the auxiliary equipment required for the mechanical engineering laboratory located on the floor above. The former consists of a 25-kw Cummings diesel driven generator, two vertical engine driven generators, 10 kw and 20 kw, and several smaller gasoline engine driven units. The other room is used for the metallurgical laboratory. It contains electrical heat treating and melting furnaces, precision pyrometers, a 250,000 volt lead shielded X-Ray machine, and a well-equipped machine shop for general metal working. Two large classrooms, adequately lighted, are in the basement at the front of the building. One of these is used for a mechanical drawing room.

The main floor consists of four well-lighted classrooms, a study room, a library of technical books, the mechanical engineering laboratory, and the materials testing laboratory. The mechanical engineering laboratory contains a 60-kw turbogenerator, a 35-kw horizontal engine-driven generator, a large pumping section for studying the characteristics of centrifugal pumps, a commercial installation of refrigeration and air-conditioning units set up for experimentation, together with a motor-driven blower set up for determining the flow of air in ducts. Adjacent to the laboratory is a boiler room for the supply of steam in the study of thermodynamics and power engineering. The strength of materials laboratory houses a 400,000-pound Olsen tensile testing machine, a 60,000-pound Riehle testing machine, a 10,000-pound Baldwin Southwark tester, and Fairbanks-Morse concrete briquet testing equipment. The laboratory also has Rockwell, Brinell, and Scheroscope hardness testing equipment and a variety of high precision measuring instruments.

On the second floor are located the engineering drawing rooms, the physics laboratory and classroom, and the electrical laboratories. The two drawing rooms, 40 x 40 feet, are lighted with fluorescent streamers the full width of the rooms and are furnished with modern drafting room equipment. The physics laboratory, 68 x 38 feet, has ample floor space and head room for the use of the wide variety of experimental apparatus with which it is equipped. The laboratory has been furnished with apparatus which will permit the performance of the college grade experiments as published by the Central Scientific Company. Due to the large size of the laboratory, the major equipment is completely assembled and available at all times for experimentation. The laboratory is wired for direct current, single- and three-phase alternating current. The physics classroom connects directly with the laboratory, a feature appreciated by student and teacher alike. In this room the demonstration-lecture table is provided with the usual gas, current, and water together with a variety of large-scale demonstration equipment. Visual aids, motion pictures, and slide films are used to supplement the demonstrations.

The electronic laboratory is located on the second floor for the experimental work in electron dynamics and electronic applications. Various oscillators, high-frequency generators, tubes, transformers, condensers, wave meters, and other apparatus are available for student use. The main electrical engineering laboratory is located next to the electronic laboratory and it consists of a room 68 by 38 feet. In the electrical engineering laboratory next to the electronic laboratory is located a double-generator, motor-driven set. This generator is capable of supplying 4,500 volts of direct current for electronic tube plate application in the electronic laboratory. A five-kw motor generator with two interchangeable armatures for extending the range of

electronic principles is available for student use. It may also be driven by a separate slip-ring induction motor rather than by its own synchronous. This motor generator set is designed especially by the Westinghouse Electric Corporation for educational institutions and a variety of experiments on rotating machines can be performed with this equipment.

Reference: Youngstown College Catalog for l947-48, 48-49 and 49-50. Also, Youngstown College Neon for l950.

EXHIBIT IV

Description: Interior of Engineering Science Building

The Engineering Science Building is the home of the William Rayen School of Engineering. The use of the building was a gift to the university by the people of Ohio as enacted by the Ohio Legislature in 1965. The building was completed in 1968 after the University became Youngstown State University. It contains 171,000 square feet of usable floor space which includes 48 laboratories, 30 classrooms, and eight research and development rooms.

The school's spacious laboratories have modern equipment for standard experiments and advanced study in many fields. There is a 288-seat auditorium, facilities for closed circuit television, and a computer center. The school also operates a machine shop to construct equipment used in research activities. The ample drawing rooms, classrooms, and offices are entirely modern.

The Chemical Engineering Unit Operations Laboratories are located in the Engineering Science Building and the Ward Beecher Science Building.

There are six laboratories which are equipped with bench scale and pilot plant equipment to be used for heat and mass transfer and chemical reactions. The available facilities include an analog computer, pneumatic controllers, chemical reactor, distillation and absorption columns, double effect evaporator, grinding and crushing mills, rotary and vacuum tumble dryers, vacuum leaf and plate frame filters, extraction units, and a gas chromatograph.

The Civil Engineering Laboratories include the following: a concrete laboratory, an environmental engineering laboratory, an incompressible fluids laboratory, a photogrammetry laboratory, a soil mechanics laboratory, a strength of materials laboratory, and a surveying laboratory.

The concrete laboratory is equipped to do routine testing and research related to effects of static, dynamic, and impact loads.

The environmental engineering laboratory is equipped to perform bacteriological, chemical, and physical tests and research on water and waste-water.

The incompressible fluids laboratory is equipped to perform a variety of fluid flow experiments. The equipment includes a self-contained flume, 4' x 3' x 60' long, an 80' x 4' x 4' flow channel, and a constant-head standpipe.

The photogrammetry laboratory is equipped with a Kelsh Plotter and auxiliary equipment.

The strength of materials laboratory is equipped to perform strength tests on materials. The equipment includes a 600,000-pound Universal Testing Machine, three 120,000-pound Universal Testing Machines, three torsion machines, as well as a variety of smaller testing machines.

The surveying laboratory is equipped for instruction in the care and use of all surveying instruments and calculating machines.

The Electrical Engineering Laboratories include a circuits laboratory, basic electronics laboratory, physical electronics laboratory, quantum electronics laboratory, networks and

communications laboratory, switching circuits and communications laboratory, electromagnetic energy conversion laboratory, controls laboratory, and fields laboratory, all of which have an ample supply of standard and specialized equipment.

The electronics laboratories contain signal generators; oscilloscopes; equipment for the study of thin films, thick films, and membranes; XY recorders; ruby and helium-neon lasers; vacuum systems; optical benches; monochromators; spectraphotometers; spectrographs; an array of beam-splitters; optical attenuators; and Q-switches.

The communications laboratories contain a variety of signal generators, frequency analyzers, transmission lines, breadboard modules, and a digital computer.

The electromagnetic energy conversion laboratory has available generalized machines, magnetic core devices, rotating amplifiers, torque translators, and a variety of frequency and speed instruments.

The controls laboratory includes a variety of circuit components, amplifiers, analog computers, a function follower, and function generators.

The fields laboratory has available microwave generators, wave guides, meters, antennae, a shielded room, and a large roof area for tracking radiation and solar experiments.

The Mechanical Engineering Department maintains eight laboratories in the Engineering Science Building. Located on the first floor are laboratories for thermodynamics, heat transfer, compressible fluids, internal combustion engines, and photoelasticity. Laboratories for heat power, experimental machine design, and vibrations are located in the basement.

The laboratories for the heat and flow areas of study contain such major apparatus as a steam power plant; subsonic and supersonic wind tunnels; conduction, convection, and radiation heat transfer units; a 90-horsepower gas turbine with test stand; commercial refrigeration and air conditioning units; various internal combustion engines; steam boiler, engine, and turbine; and gas analyzers.

The laboratories in the mechanical design area of study are equipped with apparatus necessary for static, dynamic, and impact stress analysis by methods employing electrical strain gages, photoelasticity, and brittle lacquers; a long-time creep tester; fatigue testers; vibration sources with analyzers and recorders; and an analog computer.

The Metallurgical Engineering Laboratories, located in the basement and first floor of the Engineering Science Building, include a field-ion microscope laboratory, electron microscope laboratory, multipurpose radio-isotope analysis, counting system, diffusion laboratory, radiograph laboratory, x-ray laboratory, phase transformation laboratory, calorimetric laboratory, metallographic laboratory, high pressure and high temperature laboratory, ultrasonic laboratory, electric and magnetic properties laboratory, special process metallurgy laboratory, zone melting laboratory, welding laboratory, electrometallurgy laboratory, alloy preparation laboratory, single crystal laboratory, and a general mineral benefication laboratory.

The various metallurgical laboratories are equipped for all phases of metallurgical studies with the latest modern equipment, which includes a modified calorimeter with special accessories such as a quartz thermometer, sophisticated adiabatic calorimeter, and modern electronic devices; heat treatment facilities such as salt pots and electric furnaces; dark room facilities; large metallographs; microscopes; rolling mills and forming equipment; electron beam zone refiner; induction furnaces; grinding equipment; mounting presses; motorized specimen

polishers; specimen etching facility; sectioning tools; a collection of more than 400 prepared specimens; hardness testers; and high-speed cut-off machines.

Reference: Youngstown State University Bulletin: Catalog Issue for 1968-69; pages 160 and 161.

APPENDIX A

Colleges and Universities

Name and Location	Code	Yr.Est.
Air Force Institute of Technology, Wright-Patterson AFB, OH	f, e	1946
University of Akron, Akron, OH	so, e, t	1870
Beaver College, Glenside, PA	p	1853
Bowling Green State University, Bowling Green, OH	so	1910
Carnegie Mellon University, Pittsburgh, PA	p, e	1900
Case-Western Reserve University, Cleveland, OH	p, e	1880-1826
Central State College, Wilberforce, OH	so, e	1887
Cincinnati Technical College, Cincinnati, OH	p, t	1966
University of Cincinnati, Cincinnati, OH	so, e, t	1819
Cleveland State University, Cleveland, OH	so, e	1923
University of Dayton, Dayton, OH	c, e, t	1850
Gannon University, Erie, PA	p, e	1925
Geneva College, Beaver Falls, PA	p	1848
Grove City College, Grove City, PA	c, e	1876
Hiram College, Hiram, OH	p	1850
Kent State University, Kent, OH	so	1910
Kent State University, Tuscarawas Campus, New Philadelphia, OH	so, t	1962
Marietta College, Marietta, OH	p, e	1835
Miami University, Oxford, OH	so, e	1824
Oberlin College, Oberlin, OH	p	1833
Ohio Northern University, Ada, OH	c, e	1871
Ohio State University, Columbus, OH	so, e	1870
Ohio University, Athens, OH	so, e	1804
Owens Technical College, Toledo, OH	so, t	1967
Pennsylvania State University, University Park, PA	s, e	1855
University of Pittsburgh, Pittsburgh, PA	s, e	1787
Sinclair Community College, Dayton, OH	p, t	1887
Slippery Rock State College, Slippery Rock, PA	s	1889
Stark Technical College, Canton, OH	so, t	1960
Thiel College, Greenville, PA	c	1866
University of Todedo, Toledo, OH	so, e, t	1872
Westminster College, New Wilmington, PA	c	1852
West Virginia University, Morgantown, WV	s, e	1867
West Virginia Institute of Technology, Montgomery, WV	s, e, t	1895
Wright State University, Dayton, OH	so, e	1964
Youngstown State University, Youngstown, OH	so, e, t	1908

Code Legend:
- so – Ohio State System
- s – Other State Institutions
- f – Federal Institutions
- p – Private Institutions
- c – Church Institutions
- e – ABET Accredited for Engineering
- t – ABET Accredited for Engineering Technology

APPENDIX B

National Engineering Organizations

Name		Code	Yr.Est.
AAEE	American Academy of Environmental Engineers	ABET-pr	1955
ACSM	American Congress on Surveying and Mapping	ABET-pr	1941
AIAA	American Institute of Aeronautics and Astronautics, Inc.	ABET-pr	1931
AIChE	American Institute of Chemical Engineers	ABET-pr	1908
ANS	American Nuclear Society	ABET-pr	1954
ASAE	American Society of Agricultural Engineers	ABET-pr	1907
ASCE	American Society of Civil Engineers	ABET-pr	1852
ASEE	American Society for Engineering Education	ABET-pr	1893
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.	ABET-pr	1894
ASME	American Society of Mechanical Engineers	ABET-pr	1880
IIE	Institute of Industrial Engineers, Inc.	ABET-pr	1848
IEEE	The Institute of Electrical and Electronics Engineers	ABET-pr	1884
TMS	The Minerals, Metals, and Materials Society	ABET-pr	1959
NCEES	National Council of Examiners for Engineering and Surveying	ABET-pr	1920
NICE	National Institute of Ceramic Engineers	ABET-pr	1938
NSPE	National Society of Professional Engineers	ABET-pr	1934
SAE	Society of Automotive Engineers	ABET-pr	1905
SME	Society of Manufacturing Engineers	ABET-pr	1932
SME	(of AIME) Society for Mining, Metallurgy, and Exploration, Inc.	ABET-pr	1959
SNAME	Society of Naval Architects and Marine Engineers	ABET-pr	1893
SPE	Society of Petroleum Engineers	ABET-pr	1959
ISA	Instrument Society of America	ABET-as	1945
ACEC	American Consulting Engineers Council	ABET-af	1973
AIME	American Institute of Mining, Metallurgical, and Petroleum Engineers (Consists of TMS, SME, SPE, and the Iron and Steel Society)	ABET-af	1871
ASNT	American Society of Nondestructive Testing	ABET-af	1941
ASSE	American Society of Safety Engineers	ABET-af	1911
SPIE	Society of Plastics Engineers	ABET-af	1942
SWE	Society of Women Engineers		1950
AWS	American Welding Society		1919
ASQC	American Society for Quality Control		1946
ASM	American Society for Metals		1913

Code Legend: ABET – Accreditation Board for Engineering and Technology
pr – Participating Body
as – Associate Body
af – Affiliate Body

APPENDIX C

Local Engineering Organizations

	Name	Code	Yr.Est
AIChE	American Institute of Chemical Engineers	MVTSC	
AIPE	American Institute of Plant Engineers	MVTSC	
AISE	Association of Iron and Steel Engineers	MVTSC	
APICS	American Production and Inventory Control Engineers	MVTSC	
ASCE	American Society of Civil Engineers	MVTSC	1957
ASM	American Society of Metals (Warren)	MVTSC	
ASM	Association of Systems Management (Steel Valley)	MVTSC	
ASME	American Society of Mechanical Engineers, Youngstown Section	MVTSC	1928
ASNT	American Society of Nondestructive Testing	MVTSC	
ASSE	American Society of Safety Engineers	MVTSC	
AWS	American Welding Society	MVTSC	
IIE	Institute of Industrial Engineers	MVTSC	
MVSPE	Mahoning Valley Society of Professional Engineers	MVTSC	1935
AIIE	American Institute of Industrial Engineers, Youngstown Section		

Code: MVTSC – Mahoning Valley Technical Societies Council Membership

APPENDIX D

FACULTY

Name and Degree	Area	PT/FT	Year(s)
Abboud, Pierre, M.S.E.E.	Elec. Engr. Tech.	PT	84-87
Abraham, Martin A., Ph.D.	Dean, STEM	FT	07-08*
Ahmed, Shaffiq-Uddin, Ph.D.	Met. Engr.	FT	61-96
	Chairman, Met. Engr.		68-71
Airato, Scott A., M.S.	Civ./Envr. Engr.	PT	01-02
Akut, Prakash, M.B.A.	Comp. Tech.	PT	84-87
Alam, Javed, Ph.D.	Civ. Engr.	FT	83-93
	Civ. & Envr. Engr.		93-96
	Civ./Envr. & Chem. Engr.		93-08*
Alexander, Charles K., Ph.D.	Elec. Engr.	FT	73-80
Anderson, Glen R., M.S.	Civ./Envr. Engr.	PT	04-06
Arnett, Donald Raymond, M.S.	Mech. Engr.	FT	63-93
Arthur, John H., B.S.E.E.	Elec. Engr.	FT	49-51
Ashmus, Donald H., M.S.Ch.E.	Chem. Engr.	FT	56-57
Attwood, Brian	Met. Engr. & Mat. Sci.	PT	69-71
Ault, Wayne Edward, B.S.E.E.	Civ. & Elec. Engr.	PT	56-68
Babcock, Donald E., Ph.D.	Chemistry	PT	46-49
Bacon, Belinda A., M.S.	Civ./Envr. Engr.	PT	03-04
Bagheri, Mahammad Ali, M.S.	Elec. Engr.	PT	82-83
Baker, Raymond L., B.E.	Ind. Engr.	PT	57-65
Bakos, Jack David, Ph.D.	Civ. Engr.	FT	70-00
	Chairman, Civ. Engr.		80-93
	Chair., Civ. Engr.		80-93
	Chair., Civ./Envr. Engr.		93-96
	Chair., Civ./Envr. & Chem. E.		96-00
	Civ./Envr. Engr.	PT	00-06
Barbari, Elie L.	Elec. Engr. Tech.	PT	87-88
Barsch, William Otto, Ph.D.	Mech. Engr. Tech.	FT	70-96
	Coord., Mech. Engr. Tech.		70-82
	Chair., Engr. Tech.		82-95
	Mech. Engr. Tech.	PT	96-97
Bartholomy, Richard	Engr. Tech.	PT	99-07
Bassil, I.	Elec. Engr. Tech	PT	86-88
Bassil, N.	Elec. Engr. Tech.	PT	87-88
Baun, Mark Douglas, M.Sc.	Civ. Engr. Tech.	PT	93-00
Becker, Carl E.	Civ. Engr.	PT	68-69
Beddall, Edward A., B.S.	Applied Science	PT	42-43
Beede, Dwight V., B.S.	Engr. Drwg.	PT	30-33
Bellama, Edey Joseph	Elec. Engr. & Drwg.	PT	49-53
Bellini, Paul X., Ph.D.	Civ. Engr.	FT	69-82
Benkner, Karl H., M.E.	Mech. Drwg.	FT	42-62
Beraduce, Kenneth J., B.S.A.S.	Comp. Tech.	PT	83-89
Beranek, Bruce P.	Engr. Tech.	PT	72-73
Besner, David J., Ph.D.	Civ. Engr.	FT	70-71
Bhada, Robinton K., Ph.D.	Chem. Engr.	PT	83-84
Bisson, Brian	Engr. Tech.	PT	98-99
Blake	Elec. Engr. Tech.	PT	85-86

Block, Donald, B.S.I.E.	Ind. Engr.	PT	52-57
Bodi, Thomas W., B.Arch.	Civ. Engr. Tech.	PT	90-91
Bodnovich, Thomas A., M.S.	Comp. Tech.	FT	89-93
	Comp. & Info. Sys.		93-08*
Bolkovac, William D., M.S.	Mech. Engr. Tech.	PT	84-86
Bomberger, Howard	Met. Engr. & Mat. Sci.	PT	69-71
Bomberger, Howard, Ph.D.	Mech. Engr.	PT	96-97
Bosela, Paul A., M.S.	Civ. Engr.	PT	83-85
Bosela, Theodore R., Ph.D.	Elec. Engr. Tech	FT	88-01
	Dir. Tech.		98-01
	Coord., Elec. Engr. Tech.		91-07
	Coord., Power Plant Tech.		07-08*
	Coord., Elec. Utility Tech.		07-08*
Bostwick, Donald, B.S.	Applied Science	PT	40-43
Botros, Peter E., Ph.D.	Mech. Engr.	FT	80-84
Boyarko, George A., B.S.A.S.	Comp. Tech.	PT	80-95
Brogley, Kevin, B.S.	Comp. Tech.	PT	88-89
Bowers, Scott	Engr. Tech.	PT	05-06
Brown, Graham B., B.E.E.	Engineering	PT	47-48
Browne, Chester H., B.E.	Mech. Drwg.	PT	60-74
Burke, James M., B.S.A.S.	Elec. Engr. Tech.	PT	84-87
Burke, Theodore, B.E.	Mech. Engr. Tech.	PT	84-87
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Cala, Martin, Ph.D.	Ind. Engr.	FT	92-08*
	Coord., Ind. & Sys. Engr.		99-08*
Cantarell, Michael D., M.S.	Mech. Tech	FT	07-08*
Cantelmo, Mika A., B.S.	Mech. Engr. Tech.	PT	84-91
Caraccia, Anne V., B.S.	Drftg. Des. Tech.	PT	83-86
Caraccia, Joseph, B.E.	Elec. Engr. Tech.	PT	84-87
Carbaugh, Danial	Engr. Tech.	PT	02-03
Carfora, Ralph V.	Engr. Tech.	PT	00-08
Carhart, Clarence M., B.S.C.E.	Mech. Drwg. & Math.	PT	28-53
Cario, Marne, Ph.D.	Ind. Engr.	PT	96-98
Carle, Harold Rexford, B.C.E.	Civ. Engr.	PT	53-56
Cavin, Robert W. Jr., B.E.E.	Elec. Engr. Tech.	PT	84-90
Cernica, John N., Ph.D.	Civ. Engr.	FT	58-90
	Head, Civ. Engr.		58-60
	Chair., Civ. Engr.		60-71
	Civ./Envr. Engr.	PT	00-06
Charignon, Michael Jean, Ph.D.	Elec. & Mech. Engr.	FT	50-78
	Asst. Dean, Engr.		51-56
	Head, Mech. Engr.		55-56
	Head, Ind. Engr.		56-60
	Chairman, Ind. Engr.		60-67
	Dean, Engineering		56-77
Cheney, George E., B.E.E.	Elec. Engr.	PT	57-58
Chidamber, Shyam, R., M.S.	Elec. Engr.	PT	83-84
Chrobak, Theodore S., M.S.	Chem. Engr.	FT	64-70
	Coord., Comp. Tech.		70-91
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Ciminero, Ronald N., M.S.	Comp. Tech.	FT	72-73

	Elec. Engr. Tech.		77-81
Collins, Ian, Ph.D.	Civ. Engr.	PT	82-83
Conrad, Sean	Engr. Tech.	PT	04-05
Cornwell, Leonard R.	Met. Engr. & Mat. Sci.	PT	71-72
Costarell, Michael	Engr. Tech.	PT	00-04
Courtney, Thomas H., Sc.D.	Met. Engr.	PT	66-67
Cowan, Walter Y., M.B.A.	Comp. Tech.	PT	83-86
			92-95
Cox, B. T.	Engineering	PT	49-50
Crane, Robert L., B.S.	Physics	FT	48-49
Crum, Donald	Engr. Tech.	PT	02-03
			05-07
Crum, Ralph G., Ph.D.	Coord., Civ. Engr. Tech.	FT	70-96
Civ. Engr. Tech.		PT	96-00
Culler, James A., M.S.	Civ. Engr.	FT	82-85
		PT	91-95
Culley, John Hugh, B.S.C.E.	Civ. Engr.	PT	53-55
Damshala, Prakash Rao, Ph.D.	Mech. Engr.	FT	78-82
Dance, Robert, B.S.M.E.	Engr. Tech.	PT	84-85
Dandapani, Ramaswami, Ph.D.	Comp. Tech. & Comp. Sci.	FT	75-79
D'Angelo, John N., B.E.	Engr. Drwg.	PT	62-81
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		PT	87-93
Dann, Walter M., M.E.E.E.	Elec. Engr.	FT	48-49
Dannessa, Domenic A., M.S.	Mech. Engr.	PT	83-85
Daum, Frank R., B.S.	Ind. Engr.	PT	50-52
Davidson, Frank C., M.B.A.	Comp. Tech.	PT	87-92
Davidson, Thomas R., B.S.	Comp. Tech.	PT	87-96
DeChant, Gerald	Engr. Tech.	PT	00-05
Dechant, Gerald R., B.S.A.S.	Elec. Engr. Tech.	PT	89-96
Deesz, Louis A., E.E.	Elec. Engr.	PT	40-43
	Dean, Engineering	FT	44-50
DeHart, Lester Edgar, B.S.C.E.	Civ. Engr.	PT	55-56
Deuchler, Luman Youngs, M.S.	Mech. Engr.	FT	59-62
Devletian, Jack H., Ph.D.	Chem. Engr. & Mat. Sci.	FT	73-79
Dew, Rick A., B.S.A.S.	Mech. Engr. Tech.	PT	94-96
DiLiello, Laura K., M.S.E.	Elec. Engr. Tech.	PT	88-89
D'Isa, Frank A., Ph.D.	Mech. Engr.	FT	47-92
	Head, Mech. Engr.		56-60
	Chairman, Mech. Engr.		60-92
	Actg. Dean, Grad. Schl.		70-71
	Engr. Drwg.	PT	93-94
Doerling, John F., B.S.E.E.	Elec. Engr.	PT	55-60
Doll, Denton T., M.S.	Math. & Engr.	FT	33-41
Donahue, Caroline T., B.E.	Elec. Engr. Tech.	PT	84-85
Dubos, John M., M.B.A.	Comp. Tech.	PT	90-96
Downie, Douglas, M.S.	Civ. Engr.	PT	56-66
Driscoll, Wade C., Ph.D.	Ind. Engr.	FT	72-07
	Chair., Ind, Engr.		83-93
	Chair., Ind. & Sys. Engr.		93-95
	Coord., Ind. & Sys. Engr.		04-05
	Ind. & Sys. Engr.	PT	05-08
Dubos, John	Ind. & Sys. Engr.	PT	96-07
Duca, Stephen V., M.S.	Elec. Engr.	PT	82-83

Dundics, Thomas	Engr. Tech.	PT	03-05
Elias, Thomas I., Ph.D.	Mech. Engr.	FT	83-89
Elliott, Michael	Engr. Tech.	PT	03-04
Ellis, Frank M., M.S.	Engr. and Phys.	FT	46-77
	Actg. Dean, Engr.		50-54
	Asst. Dean, Engr.		55-60
	Actg. Head, Physics		53-60
	Actg. Chair., Physics		60-66
	Dir., Science & Math.		63-65
	Chairman, Physics		66-68
	Chair., Phys. & Astro.		68-74
Eppinger, Robert D., B.S.	Comp. Tech.	PT	90-92
Erste, John	Engr. Tech.	PT	96-08
Erzurum, Halil, M.S.	Mech. Engr.	PT	61-66
		FT	66-71
Esseniyi, Alexander	Engr. Tech.	PT	98-99
Estes, Edward R.	Civ. Engr.	PT	73-74
Evans, Paul Jr., M.S.	Elec. Engr.	PT	49-52
Everest, David H., B.S.I.E.	Engr. Drwg.	PT	42-43
Evers, Dillon, Ph.D.	Met. Engr.	PT	60-62
Fabian, Stephen	Engr. Tech.	PT	00-01
Fercenko, Richard	Engr., Tech.	PT	03-05
Filatovs, George J., Ph.D.	Met. Engr.	FT	69-72
Fisher, Edward J. P., B.S.	Met. Engr.	FT	50-68
	Head, Met. Engr.		55-60
	Chairman, Met. Engr.		60-68
Fives, Frank M., B.S.M.E.	Physics	PT	41-42
Fleder, Adam R., B.S.E.T.	Elec. Engr. Tech.	PT	88-89
Foard, Castle W. Ph.D.	Math. and Physics	FT	30-43
Fok, Thomas D. Y., Ph.D.	Civ. Engr.	FT	59-68
Folta, Lawrence W., M.B.A.	Comp. Tech.	FT	71-72
Foulkes, Robert H. Jr., Ph.D.	Elec. Engr.	FT	71-05
	Chair., Elec.		82-84
Fowles, Clifford E., B.S.	Engr. Drwg.	PT	42-48
Franklin, Edward C., B.S.C.E.	Dean, Engineering	FT	54-56
	Head, Civ. Engr.		54-56
	Head, Ind. Engr.		54-56
Freaney, John P., B.S.A.S.	Comp. Tech.	PT	81-83
			90-91
Frazer, Robert H., B.S.	Met. Engr.	PT	60-62
Fries, Gerald, B.E.E.	Elec. Engr.	PT	47-51
Fullum, Jerry	Engr. Tech.	PT	01-02
Fuzo, John V., B.E.	Elect. Engr. Tech.	PT	84-89
Gagich, Robert Jr., M.S.	Civ. Engr.	PT	82-83
Gagliano, John, B.S.	Mech. Engr. Tech.	PT	87-91
Gallo, Johnathon	Engr. Tech.	PT	98-08
Garcar, David, B.S.A.S.	Elec. Engr. Tech.	PT	85-86
Garcar, Robert Jr., M.S.	Elec. Engr. Tech.	PT	85-88
Garchar, Edward	Engr. Tech.	PT	03-08
Garchar, Edward, B.S.A.S.	Mech. Engr. Tech.	PT	85-91
Gardner, Steve R., Ph.D.	Coord., Elec. Engr. Tech.	FT	70-96
	Elec. Engr. Tech.	PT	96-97
Garr, Jeanette M., Ph.D.	Chem. Engr.	FT	94-08*
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Garton, Laurie Schrieber, M.E.	Civ. & Envr. Engr.	FT	96-02
Gaydos, Richard J., M.S.	Comp. Tech.	FT	82-94
	Comp. & Info. Sys.		94-08*
Gerba, Albert M.	Comp. Tech.	PT	69-71
George, John H., M.S.	Mech. Tech.	FT	01-05
Ghaffarzadeh, Mehdi, M.S.	Civ. Engr.	FT	69-70
Ghazi, Hassan S., Ph.D.	Mech. Engr.	FT	81-82
Gibbs, Jesse B., B.S.	Elec. Engr.	PT	51-52
		FT	52-63
Gibson, David R., B.S.A.S.	Drftg. Des. Tech.	PT	85-92
Gibson, John M.	Chem. Engr.	PT	05-08*
Goncz, Joseph Frank Jr., M.S.	Elec. Engr.	FT	63-70
Gonzalez, Pastor S., M.S.	Ind. Engr.	FT	69-71
Good, John B., B.S.	Mech. Engr.	PT	82-83
Good, Walter E., M.B.A.	Ind. Engr.	PT	82-89
	Engr. Drwg.	PT	90-93
Grabski, John D., B.S.M.E.	Mech. Engr.	FT	47-52
Grayson, Randall	Engr. Tech.	PT	97-06
Grimes, Ernest A., B.E.E.	Elec. Engr.	PT	52-55
Grist, Wallace Samuel, B.E.	Mech. Engr.	FT	57-59
Grizzi, Phillip	Elec. Engr.	PT	99-00
Gross, Arnold, B.M.E.	Engr. Drwg.	FT	49-50
		PT	50-57
			80-86
Gross, Daryl D., M.B.A.	Mech. Engr. Tech..	PT	90-08
Guffey, John W., B.E.	Ind. Engr.	PT	64-68
Guillett, Warren, M.B.A.	Ind. Engr.	PT	83-84
Guzan, Kimberly, A.	Chem. Engr.	PT	01-03
Hage, C. Herbert	Engr. Tech.	PT	72-73
Hagigat, Michael K., Ph.D.	Mech. Engr.	FT	92-93
Halick, Edward Stephen, B.E.	Mech. Engr.	PT	92-93
Hankey, Frank Albert, Ph.D.	Elec. Engr.	FT	70-74
	Elec. Tech.		82-96
Hans, Richard	Engr. Tech.	PT	97-05
			06-08
Hart, John W., B.S.Ed.	Comp. Tech.	PT	84-86
Hassan, Ameer, M.S.	Mech. Engr.	FT	88-90
Havas, George	Engr. Tech.	PT	00-01
Hawthorne, Samuel E.	Engr. Tech.	PT	70-74
Hayward, John. C., Ph.D.	Civ. Engr.	PT	85-86
Heindlhofer, Kalman, Ph.D.	Met. Engr.	PT	59-68
Hendrickson, Tedford M., B.M.E.	Mech. Engr.	PT	50-57
Herbstritt	Elec. Engr. Tech.	PT	85-86
Herlinger, George R., B.S.A.S.	Mech. Engr. Tech.	PT	91-93
Herndon, Thomas C., Ph.D.	Comp. Tech.	FT	72-75
Hertzel, Cynthia S., Ph.D.	Dean, Engr.	FT	02-07
	Civ./Envr. and Chem. Engr.		02-08
Hibbler, Russell C., Ph.D.	Civ. Engr.	FT	69-72
Hogan	Comp. Tech.	FT	89-94
	Comp. & Info. Sys.		94-96
Hogue, Robert A., M.S.	Comp. Tech.	FT	89-93
	Comp. & Info. Sys.		93-94
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Holland, James	Engr. Tech.	PT	04-06
Houck, Hugh N., B.S.I.E.	Ind. Engr.	PT	52-57
Householder, Michael K., Ph.D.	Civ. Engr.	FT	69-79
	Chairman, Civ. Engr.		77-79
Howard, Leland	Engr. Tech.	PT	70-71
Hoxworth, Ronald J., M.B.A.	Comp. Tech.	PT	79-87
Hsiao, Ten-Chuan, Ph.D.	Elec. Engr. Tech.	FT	83-85
Hughes, Arthur V., M.S.	Engineering	PT	49-50
Hughes, Myron A.	Met. Engr.	PT	42-43
Hurayt, Gerald	Ind. & Sys. Engr.	PT	95-96
Husain, Shakir, Ph.D.	Civ. Engr.	FT	89-93
	Civ. & Envr. Engr.		03-08*
Hyden, John	Engr. Tech.	PT	02-07
Islam, A.K.W. Anwarul, Ph.D.	Civ. & Envr. Engr.	FT	06-08*
Iyer, Muralidharan R., M.S.	Comp. Tech.	FT	85-89
Jalali, Jalal, Ph.D.	Elec. Engr.	FT	85-08*
	Chair., Elec. & Comp. Engr.		93-08*
Jamison, Mark	Chem. Engr.	PT	98-99
Janeshak, Bill J.	Engr. Tech.	PT	73-74
Jeffers, George Karl, B.E.	Met. Engr.	PT	65-66
Johnson, Harold N., A.M., L.L.B.	Math. & Engr. Drwg.	PT	47-61
		FT	61-69
Johnstone, David W., M.S.	Civ./Envr. Engr.	PT	06-08*
Johntony, John	Engr. Tech.	PT	98-99
Jone, Louis Philip, M.E.	Mech. Engr.	FT	56-58
Jones, Richard W., Ph.D.	Met. Engr. & Mat. Sci.	FT	69-96
	Dir., Mat. Sci.		87-96
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	Chem. Engr.	PT	99-01
Kahn	Civ. Engr.	FT	78-93
	Civ. & Envr. Engr.		93-08*
Karrer, Carl W.	Engr. Tech.	PT	71-72
Kearns, John L., Ph.D.	Ind. Engr.	FT	71-84
Keck, Arlin D., M.S.	Civ. Engr. Tech.	PT	84-92
Kennedy, Todd	Engr. Tech.	PT	98-05
			06-07
Kerr, Robert M., B.S.M.E.	Mech. Engr.	PT	49-55
Khan, Irfan Ahmad, Ph.D.	Civ. Engr.	FT	78-93
	Civ. & Envr. Engr.		93-96
Khaouli, Robert	Engr. Tech.	PT	97-98
Kim, Hyun W., Ph.D.	Mech. Engr.	FT	83-08*
	Chair., Mech. Engr.	PT	96-97
	Chair., Mech. & Ind. Engr.		97-06
Kinkuyoe, Nicholas, M.S.	Engr. Tech.	PT	89-01
Kircher, Ralph	Engr. Drwg.	PT	37-41
Kitchen, Brian J., Ph.D.	Mech. Engr.	FT	90-92
Klaesius, Karl	Engr. Drwg.	PT	24-37
Klim, Paul	Civ. Engr. & Engr. Tech.	PT	68-73
Kline, Edward	Engr. Tech.	PT	07-08
Klingshirn, Eugene A., M.S.	Elec. Engr.	FT	49-61
Knapic, John J., B.S.A.S.	Elec. Engr. Tech.	PT	85-93
Knapik, John, B.E.	Ind. Engr.	PT	90-91

Komsa, Jack, B.S.A.S.	Comp. Tech.	PT	81-87
Kosling, Henry P.	Engr. & Geol.	PT	49-51
Kostelic, Thomas	Engr. Tech.	PT	96-97
			00-01
Kostrubanic, Robert M.	Ind. Engr.	PT	68-69
Kotas, John S., B.S.A.S.	Comp. Tech.	PT	87-88
Kovach, Paul John, M.S.	Met. Engr.	FT	62-64
Kowalczyk, Frank J., B.E.	Elec. Engr.	PT	60-71
Kramer, E. Raymond, M.S.E.E.	Elec. Engr.	FT	51-89
	Head, Elec. Engr.		55-60
	Chairman, Elec. Engr.		60-77
Kroeger, William C., B.E.	Math. & Phys.	PT	49-57
Krompegal, John A., B.E.	Elec. Engr. Tech.	PT	84-87
Krygowski, Francis R., M.S.	Mech. Engr. Tech.	FT	81-96
	Coord., Mech. Engr. Tech.		82-96
Koran, Stephen E., B.S.	Engineering	FT	46-48
Kudav, Ganesh, Ph.D.	Mech. Engr.	FT	89-08*
Kuhr, Hans J., M.S.E.E.	Elec. Engr. Tech.	FT	80-82
Kumar, Ajit, Ph.D.	Comp. Tech.	FT	82-93
Kumar, Ravi, Ph.D.	Elec. Engr. Tech.	PT	85-86
Kurtanich, David G.	Civ. Tech.	PT	93-97
MSCE	Civ. Tech.	FT	01-08*
	Coord., Civ. Tech.		02-08*
	Coord., Drft. & Des. Tech.		07-08*
Kurtanich, Joseph A.	Civ./Envr. Engr.	PT	03-08
Krygowski, Francis M.	Mech. Engr. Tech.	FT	81-07
M.S.	Coord., Mech. Engr. Tech.		82-07
Lackney, Joseph, Ph.D.	Civ. Engr.	PT	85-86
Laighlin, Richard	Engr. Tech.	PT	03-08
Lamb, Carol M.	Engr. Tech.	PT	04-05
	Engr. Tech.	FT	06-08*
	Coord., Drft. & Des. Tech.		06-07
Lannon, Robert J., B.S.	Civ. Engr. Tech.	PT	86-87
Latif, Muhammad, Ph.D.	Elec. Engr.	FT	82-83
Lazor, Edward W., B.E.	Elec. Engr. Tech.	PT	84-87
Lazorishak, Frank	Engr. Tech.	PT	98-04
Lee, Hosin, Ph.D.	Civ. Engr.	FT	87-89
Lehman, John Grant, B.S.C.E.	Civ. Engr.	PT	53-56
Leonelli, Nick Joseph, B.E.	Mech. Engr.	PT	55-56
Lepore, Raymond, B.A.	Drftg. Des. Tech.	PT	84-86
			94-96
Lesher, Robert	Engr. Tech.	PT	00-01
Lewis, Douglas G.	Engr. Tech.	PT	84-98
BSAS			99-00
Lewis, Jeffrey	Ind. Engr.	PT	95-97
Liguore, Harry Myron, M.B.A.	Elec. Engr. Tech.	PT	84-94
Lim, Soon-Sik, Ph.D.	Chem. & Met. Engr.	FT	82-97
	Chair., Chem. & Met. Engr.		91-97
	Coord., Chem. Engr.		97-08*
Lisko, Dale	Engr. Tech.	PT	96-98
			99-00
Lohrasbi, Abbas, M.S.	Mech. Engr. Tech.	FT	83-86
Long, Robert E.	Engr. Tech.	PT	71-72
Look, Frederick W., Ph.B.	Civ. Engr.	FT	49-52

Look, Edith E. Swift, M.S.	Engr. Reports	PT	50-51
		FT	51-52
Lorincz, Samuel, B.E.	Elec. Engr. Tech.	PT	86-87
Lovas, Charles Michael, Ph.D.	Mech. Engr.	FT	69-79
Luginbill, Paul C., M.S.	Chem. & Chem. Engr.	PT	46-48
		FT	48-71
	Head, Chem. Engr.		55-60
	Chairman, Chem. Engr.		60-71
Lumsdaine, Andrew, M.S.	Elec. Engr. Tech.	PT	85-86
MacAllise, Raymond J., B.E.	Elec. Engr.	PT	55-57
Madeyski, Andrew	Met. Engr. & Mat. Sci.	PT	70-72
Maga, Raymond A., M.S.	Mech. Engr. Tech.	PT	84-96
			96-07
	Mech. Engr.		99-00
Maguire, Dan, M.S.	Comp. Tech.	FT	85-89
Malak, Frank J., M.Litt.	Math. & Engr.	FT	47-76
	Actg. Head, Math.		57-60
	Actg. Chair., Math.		60-62
	Chairman, Math.		62-67
Mamula, Eli	Engr. Tech.	PT	04-08
Mandeville, David	Ind. Engr.	PT	69-70
Marcone, Arthur, B.E.	Ind. Engr.	PT	59-63
Marie, Hazil, Ph.D.	Mech. Engr.	FT	06-08*
Marrs, Cyril J., B.S.M.E.	Drftg. Des. Tech.	PT	84-93
Marsico, Richard J., B.S.	Comp. Tech.	PT	87-96
Martin, Charles A., Ph.D.	Mech. Engr.	FT	94-95
Martin, Scott, Ph.D.	Civ. Engr.	FT	85-93
	Civ. & Envr. Engr.		93-08*
	Chair., Civ./Envr. & Chem. Engr.		00-08*
Massman, Luther R., B.S.M.E.	Mech. Engr.	PT	49-53
Matasic, Richard J., B.E.	Civ. Engr.	FT	67-68
Matta, Raymond M., B.E.	Chem. Engr.	PT	82-83
Maul, Gary P., M.S.I.E.	Ind. Engr.	FT	78-82
Mavrigian, Gus, Ph.D.	Math. & Engr.	PT	55-57
		FT	57-92
Mazarkas, Arthur G., B.M.E.	Engr. Drwg.	PT	84-90
McBride, Roscoe C., A.M.	Metallurgy	PT	40-42
McCoy, Robert A., Ph.D.	Mech. & Met. Engr.	FT	81-07
		PT	07-08
McGinnis, John E., Ph.D.	Met. Engr. & Mat. Sci.	FT	71-72
McNamee, Robert G., M.S.	Phys. & Elec. Engr.	FT	63-67
McNinch, Michael D.	Chem. Engr.	PT	98-99
Mediate, Rocco A., B.E.	Mech. Engr. Tech.	FT	84-95
	Mech. Engr.	PT	96-98
Mehra, Kewal Krishan, B.S.M.E.	Mech. Engr.	FT	69-70
Mehri, Hojjat, Ph.D.	Ind. Engr.	FT	83-93
	Ind. & Sys. Engr.		93-98*
	Chair., Ind. & Sts. Engr.		85-99
Messuri, Anthony P., M.S.	Elec. Tech.	FT	86-08*
	Coord., Elec. Tech		07-08*
Messuri, Dominic A., Ph.D.	Elec. Engr. Tech.	PT	90-94
Michels, LeMoyne F., B.S.	Civ. Engr.	PT	63-65
Midgley, Wesley R., M.S.	Civ. Engr. Tech.	PT	84-86
Miholits, Ernest M., Ph.D.	Civ. Engr.	FT	68-70

Mirth, Richard A., Ph.D.	Civ. Engr.	FT	79-86
Mobley, Norman V.	Ind. Engr.	PT	71-72
Molnar, Dennis E., A.B.	Comp. Tech.	PT	84-86
Moody, Robert A., Ph.D.	Chem. Engr. & Mat. Sci.	FT	80-81
Moody, Robin, B.S.	Comp. Tech.	PT	89-90
Moore, Herbert D., B.Arch.	Drftg. Des. Tech.	PT	84-94
Moosally, Arthur Anthony, B.E.	Mech. Engr.	PT	55-56
Moroose, J. Vincent, Ph.D.	Comp. Tech.	FT	81-82
Morris, Floyd E., Ph.D.	Mech. Engr.	FT	71-79
Mossayabi, Faramarz, Ph.D.	Elec. Engr. Tech.	PT	84-88
Mossayem, Paramaz,	Elec. & Comp. Engr.	FT	03-08*
Ph.D.		PT	63-68
Mottinger, Byron W., E.E.	Engineering	FT	38-42
Muller, Herman E. Jr., B.S.M.E.	Phys. & Mech. Engr.	PT	44-52
Munro, Philip C., Ph.D.	Elec. Engr.	FT	75-96
Mosure, Thomas Francis, M.S.	Civ. Engr.	FT	59-62
Moy, Kin Pong, MS	Tech.	FT	06-08*
Munholand, Luke	Chem. Engr.	FT	99-01
Narbutovskih, Paul, Ph.D.	Elec. Engr.	PT	47-51
Neider, William	Engr. Tech.	PT	05-06
			07-08
Nichol, Wilbur	Engr. Drwg.	PT	37-43
Nikkel, Henry	Met. Engr. & Mat. Sci.	PT	71-74
Nilsson, Nils	Engr. Tech.	PT	03-08
Nold, Derek	Engr. Tech.	PT	97-98
Oldash, William H., B.S.	Elec. Engr. Tech.	PT	85-86
O'Loughlin, John Rice, Ph.D.	Mech. Engr.	PT	55-57
		FT	59-60
Orlosky, Mark C., B.E.	Elec. Engr.	PT	82-85
Orning, Arnold D., M.S.	Mech. Engr.	PT	74-77
	Mech. Engr. Tech.		84-08
Orr, Thomas L.	Civ. Engr.	PT	73-74
Oyen, Leaf, B.S.C.E.	Engr. Drwg.	FT	46-49
Panko, William C., B.S.A.S.	Elec. Engr. Tech.	PT	89-96
			97-03
Panzino, Salvatore R., Ph.D.	Elec. Engr.	FT	82-96
Chairman, Elec. Engr.			84-96
Paraska, Nicholas, Ph.D.	Civ. Engr.	FT	61-68
	Dean, Tech. & Com. Col.		68-82
Parker, Bertram S.	Engineering	PT	48-50
Parris, Joel, Ph.D.	Mech. Engr.	PT	85-86
Pastorak, Ronald L., Ph.D.	Met. Engr. & Mat. Sci.	PT	71-72
Patel, Ray	Ind. Engr.	PT	71-72
Patrinos, William, B.S.	Mech. Engr. Tech.	PT	84-86
Patterson, Gerald R., B.S.E.E.	Elec. Engr.	PT	58-59
Pejack, Edwin Ray, Ph.D.	Mech. Engr.	FT	68-79
Perkins, Arthur J., Ph.D.	Mat. Sci.	PT	72-73
Peterson, John C., Ph.D.	Elec. Engr.	FT	81-82
Petrek, John Edward, M.S.E.	Mech. Engr.	PT	55-59
		FT	59-85
Petro, William M., B.E.	Ind. Engr.	PT	67-68
Phillips, James E., M.S.	Met. Engr.	PT	48-69
Pierko, John P., M.S.	Civ. Engr. Tech.	PT	97-98
		99-00	

Politzer, Lawrence M., M.S.E.E.	Elec. Engr. Tech.	FT	83-90
Potor, Valentina, A.M.	Math. & Engr.	FT	46-52
Prichard, Paul Jason, B.I.E.	Ind. Engr.	PT	50-52
Prosenjak, John A., M.Ed.	Mech. Drwg.	PT	72-84
Purdy, Sam	Met. Engr. & Mat. Sci.	PT	69-73
Quatrano, Raymond L., B.E.	Elec. Engr.	FT	50-52
Quintiliani, Gerald D.	Mech. Engr.	PT	79-80
Rabosky, Joseph G.	Civ./Envr. Engr.	PT	02-03
Rademacher, Lawrence B.	Elec. Engr.	PT	52-55
Ramalingham, Kanapathy, M.S.	Mech. Engr. Tech.	PT	85-87
Ramhoff, Robert A., M.S.	Mech. Engr.	PT	78-79
Rao, Jayathirta, M.S.	Mech. Engr.	FT	94-95
Ratliff, Richard	Ind. Engr.	PT	71-72
Raub, Craig E., M.S.	Comp. Tech.	PT	87-93
Ray, Jeffery L., Ph.D.	Mech. Engr.	FT	93-96
Reed, John R., M.B.A.	Ind. Engr.	PT	82-85
Reeves, Craig Randolph, B.E.	Elec. Engr.	PT	85-86
	Elec. Engr. Tech.	PT	86-87
Repko, Paul	Ind. Engr.	PT	98-00
Reuben, M.S. in E.	Chem. Engr.	PT	46-55
Richley, J. Philip, B.E.	Civ. Engr.	PT	55-60
Richley, Victor A., Ph.D.	Elec. Engr.	FT	57-69
	Chairman, Engr. Tech.		69-82
	Dean, Col. Apl. Sci. & Tech.		82-91
	Elec. Engr. Tech.	PT	91-96
Rimko, Robert W., M.S.	Civ. Engr.	PT	82-92
Ritter, John Frederick, M.S.	Civ. Engr.	FT	68-93
	Civ./Envr. Engr.		93-98
	Mech. Engr.	PT	98-99
	Civ./Envr. Engr.		99-08
Roncone, Anthony M., B.S.A.S.	Comp. Tech.	PT	90-96
Roncone, John E.	Engr. Tech.	PT	73-74
Roper, Stephen James, M.S.E.	Mech. Engr.	PT	66-74
Ross, Nicholas V., M.S.	Physics	FT	48-56
Rost, Duane F., Ph.D.	Elec. Engr.	FT	71-77
			82-01
Rudinec, Joseph P., M.S.	Engr. Drwg.	PT	78-94
Salata, Edmund J., B.E.	Civ. Engr.	PT	66-70
	Civ. Engr. Tech.	PT	70-71
Santos, Evelyn W.	Elec. Engr.	PT	70-72
Savich, Steven	Engr. Tech.	PT	00-01
			02-03
			04-05
			06-07
Sawyers, David, Ph.D.	Mech. Engr.	PT	99-01
			02-03
Schaefer, Glen A., Ph.D.	Mech. Engr.	PT	92-93
Schlais, Rudolph A., M.S.E.E.	Elec. Engr.	PT	67-71
Schneider, Edwin, Ph.D.	Met. Engr. & Mat. Sci.	PT	69-73
Schomer, Robert J., B.Arch.E.	Civ. Engr	PT	55-56
Schwager, William Joseph, B.E.	Ind. Engr.	PT	64-73
Scofield, Nye M., M.Ed.	Elec. Engr. Tech.	PT	85-87
Scrocco, Sylvester M., B.E.	Engr. Drwg.	PT	85-86

		FT	86-88
		PT	88-97
Scudder, Eugene Dodd, Ph.D.	Chemistry	FT	30-68
	Head, Chemistry		47-60
	Chairman, Chem.		60-68
Seagle, Stan	Met. Engr. & Mat. Sci.	PT	69-74
Seidler, Kurt	Engr. Tech.	PT	99-00
Sendaula, Heanry, Ph.D.	Elec. Engr.	FT	78-80
Shadduck, Hugh Allen, Ph.D.	Chem. Engr.	FT	59-68
Shamsi, Uzair M. Ph.D.	Civ./Envr. Engr.	PT	06-08
Sharples, Robert	Engr. Tech.	PT	04-05
Shashaty, Alex, M.S.M.E.	Mech. Engr.	PT	57-58
Shaw, Wendall A., M.S.	Elec. Engr. Tech.	PT	89-90
Shay, George	Engr. Tech.	PT	97-98
			00-03
Sheinker, Abraham, Ph.D.	Mech. Engr.	PT	03-04
Sheng, Henry P., Ph.D.	Chem. Engr.	FT	69-79
Shields, Elvin B., Ph.D.	Mech. Tech.	PT	94-95
	Mech. Engr.	FT	95-08*
Siman, Matthew, Ph.D.	Elec. Engr.	FT	57-92
	Chairman, Elec. Engr.		77-82
	Elec. Engr.	PT	93-94
Singh, Dilip K., M.Tech.	Chem. Engr. & Mat. Sci.	FT	80-93
	Chair., Chem. & Met. Engr.		87-91
Sines, Francis J., M.S.C.E.	Civ. Engr.	PT	55-57
Skarote, Samuel J., M.Sc.	Elec. Engr.	FT	66-96
Slalina, Donald, M.S.	Elec. Tech.	FT	87-06
	Coord., Drft. & Des. Tech.		96-99
	Coord., Elec. Tech.		96-01
Slaven, Harry	Engr. Tech.	PT	05-06
Slawecki, Tadeusz K., Ph.D.	Chem. Engr.	FT	71-92
	Chair., Chem. Engr. & Mat. Sci.		71-84
Smith, Chester Ray, B.S.	Ind. Engr.	PT	56-57
Smith, Eugene M., M.S.	Met. Engr.	PT	50-51
Smith, Frank L.	Mech. Drwg.	PT	28-29
Smith, James H., Ph.D.	Met. Engr.	PT	67-70
Smith, Lester W., Ph.D.	Mech. Engr.	FT	85-94
Smith, Robert	Drft. & Des. Tech.	PT	91-98
Snuggs, William A., B.S.E.E.	Ind. Engr.	PT	51-52
Snyder, Samuel	Engr. Tech.	PT	98-01
			03-08
Sohn, Sangwon, Ph.D.	Ind. Engr.	FT	84-90
Solomon, Michael, M.S.	Civ. Engr.	FT	58-68
		PT	68-69
Sorokach, Robert J., M.S.	Mech. Engr.	FT	62-67
	Ind. Engr.		67-93
	Ind. & Sys. Engr.		93-96
	Chairman, Ind. Engr.		67-83
Sovacool, Robert M., M.S.E.E.	Elec. Engr. Tech.	PT	86-88
Spencer, Todd James, B.E.	Mech. Engr.	PT	93-94
Sprangle, Richard L., B.S.A.S.	Elec. Engr. Tech.	PT	86-87
Stafford, Joseph D., M.S.C.E.	Civ. Engr. Tech.	PT	85-88

Stafford, Joseph	Civ./Envr. Engr.	PT	01-08*
Stefanik, Norma	Engr. Tech.	PT	01-03
			06-07
Stein, Gebhard M., D.Engr.	Elec. Engr.	FT	68-72
Steines, David J.	Engr. Tech.	PT	70-74
Stevems, Charles A., Ph.D.	Dean, Engr. & Tech.	FT	95-96
Stevens, John A., Ph.D.	Chem. Engr.	FT	69-78
	Dean, Engr. & Tech.	FT	95-02
Stiles, Lawrence H., B.S.	Engineering	PT	24-25
Stinellis, William	Engr. Tech.	PT	98-99
Stone, James	Engr. Tech.	PT	99-08
Strang, William G., M.S.	Mech. Engr.	PT	86-88
Stratton, James P., B.S.	Civ. & Env. Engr.	PT	93-94
Strohecker, H. Ross, B.S.M.E.	Plastics	PT	44-46
Suchora, Daniel H., Ph.D.	Mech. Tech.	FT	76-80
	Mech. Engr.		80-08*
	Actg. Chair., Mech. Engr.		94-95
	Chair., Mech. & Ind. Engr.		06-08*
Suttman, Bob	Engr. Tech.	PT	98-99
Sutton, George E., Ph.D.	Dean, Engr.	FT	77-94
	Engr. Tech.	PT	98-99
Sweeney, Harry J.	Met. Engr.	PT	42-43
Szczurek, Michael J., B.S.A.S.	Elec. Engr. Tech.	PT	84-91
Szirmay, Leslie V., Ph.D.	Chem. Engr.	FT	70-96
	Chair., Chem. Engr. Mat. Sci.		84-87
Tackett, Timothy N., M.S.	Mech. Engr.	PT	85-87
Tanik, Murat M., M.C.S.	Comp. Tech.	FT	78-79
Tarantine, Frank J., Ph.D.	Mech. Engr.	FT	58-96
	Actg. Chair., Mech. Engr.		70-72
	Chair., Mech. Engr.		92-96
	Actg. Dean, Engr.		94-95
	Mech. Engr.	PT	96-98
			99-00
			03-06
Terlecki, John P., M.S. in Ed.	Met. Engr.	PT	50-69
	Met. Engr.	FT	69-70
	Met. Engr. Tech.		70-73
Terreri, Daniel	Engr. Tech.	PT	01-02
Testa, Richard	Engr. Tech.	PT	03-04
Theiss, Nicholas	Engr. Tech.	PT	98-99
Thomas, Myron W., B.E.	Elec. Engr. Tech.	PT	84-90
Tokuz, Riza Y., Ph.D.	Civ. Engr.	FT	80-82
Torcellini, Paul A., Ph.D.	Mech. Engr.	FT	93-94
Torok, Dennis F. Jr., Ph.D.	Mech. Engr.	FT	71-74
Toth, Robert	Met. Engr. & Mat. Sci.	PT	71-74
Trantin, J. Jr., B.S.	Chem. Engr.	PT	44-48
Ulicny, Sylvester M.	Civ. Engr.	PT	68-69
Um, Wan-Sup, Ph.D.	Ind. Engr.	PT	99-00
Vaidyaraman, Subdar	Chem, Engr.	PT	03-05
Vankstaraman, Chirvella, Ph.D.	Mech. Engr.	PT	97-98
Varraux, I. A., B.S.	Ind. Engr.	PT	46-72
Vigorito, John A.	Comp. Tech.	PT	90-96
Vink, Charles E., M.S.	Elec. Engr. Tech.	PT	89-90

Vivalo, Joseph F., B.S.G.E.	Ind. Engr.	PT	57-60
Viviano, Anthony	Engr. Tech.	PT	99-00
	Mech. Engr.		04-08
Vojtko, Bernard J., M.S.	Elec. Engr.	FT	59-70
Vuksanovich, Brian D., M.S.M.E.	Engr. Tech.	FT	07-08*
	Coord., Mech. Tech.		07-08*
	Engr. Tech.	PT	83-06
Waldman, R. A., Ph.D.	Science	PT	41-48
Walker, Thomas W., B.S.	Comp. Tech.	PT	88-89
Wallace, Darrell A. Ph.D.	Mech. Engr.	FT	07-08*
Weber, Ted A., M.S.	Elec. Engr. Tech.	PT	85-86
Welch, Marcia A., A.B.	Math. & Engr.	FT	46-57
Wellman, Nicholas P., B.S.	Civ. Engr.	PT	67-68
Wertzler, Francis A., B.S., M.Ed.	Engr. Drwg.	PT	79-83
White, David	Engr. Tech.	PT	03-08
Wick, James L. Jr., B.S.	Mech. Drwg.	PT	07-08
Wilder, Allen Bliss, M.E.	Mech. Engr.	FT	57-62
Wilhoite, A. L., M.E.	Appl. Science	PT	42-46
Wilkins, Bernard T.	Engineering	PT	46-52
Williams, Laura	Engr. Tech.	PT	04-07
Williamson, Gilbert R., Ph.D.	Civ. Engr.	FT	69-74
Williamson, Robert A., M.S.	Civ./Envr. Engr.	PT	00-03
Wilms, Ernest J., Ph.D.	Civ. Engr.	PT	66-68
Wino, Vincent G. Jr., M.S.	Comp. Tech.	FT	80-89
Wise, Daniel, M.Eng.	Appl. Physics	PT	40-41
Witherspoon, T. D., B.S.	Engineering	PT	24-25
Wong, Kenneth K-H., B.S.E.E.	Elec. Engr.	FT	61-64
Wood, William A., M.Engr.	Civ. Tech.	FT	88-08*
	Coord., Civ. Tech.		96-00
	Dir., Tech.		00-08*
Woodworth, Laurin D., B.S.	Met. Engr.	PT	66-68
Yannucci, Dean Allen	Engr. Tech.	PT	69-73
Yozwiak, Bernard J., Ph.D.	Math. & Engr.	FT	47-92
	Chairman, Math.		67-72
	Dean, Arts & Sci.		72-92
	Mathematics	PT	92-96
Zager, Stanley E., Ph.D.	Chem. & Met. Engr.	FT	81-96
Zajak, John	Engr. Tech.	PT	04-07
Zenouli, Mansour, Ph.D.	Mech. Tech.	FT	91-02
Ziobert, Randall L., B.S.A.S.	Comp. Tech.	PT	87-96
Zubawick, Thomas E.	Elec. Engr.	PT	69-72
Zuckerwar, Allen J., Dr.Rer.Nat.	Elec. Engr.	FT	70-74
Zupanic, James C., M.S.C.E.	Civ. Tech.	FT	79-04
	Coord., Drft. & Des. Tech.		79-02
Krill, Karl E., Ph.D.	Met. & Mat. Sci. (Courtesy)	FT	71-77

APPENDIX E

STAFF

Name	Position	From	Until
Adger, Wilhemina	Housekeeping	9-28-67	11-30-79
Adovasio, Linda J.	Secretary, Mech. Engr. Office	11-13-95	5-10-96
	Secretary, Civ./Envr. Engr. Office	98	
Bakos, Patsy Napoliatano	Secretary, Ind. Engr. Office	69	71
Balent, Pam	Secretary, Chem. Engr. Office	7-21-91	4-30-92
	Secretary, Electronics Maint.		
Basile, Delores	Secretary, Mech. Engr. Office	4-8-68	1-9-70
	Secretary, Chem. Engr. Office	3-15-71	8-17-73
Beadling, Ida	Secretary, Ind. Engr. Office	3-27-72	10-5-79
Besenie, Margaret J.	Secretary, Dean's Office	51	55
Bevan, Joan	Secretary (temp.), Civ. Engr. Office	1-13-93	1-29-93
Blazina, Mike	Maintenance Repair	9-1-60	6-28-85
Brajer, Maureen	Secretary, Mech./Ind. Engr. Office	05	
Brewer, Beth	Secretary, Ind. Engr. Office	10-22-79	12-14-84
Carfora, Ralph Vincent	Electronics Maint.	9-4-84	
Clemen, Dahlia M.	Secretary, Chem. Engr. Office	8-30-93	
Costerall, Faye	Secretary (temp.), Chem. Engr. Office	1-2-81	10-16-81
Couch, Tom	Electrical Maint.	68	
Davidson, Virginia D'Isa	Secretary, Dean's Office	10-6-69	7-31-84
Davis, Ruth Fowler	Secretary, Dean's Office	46	47
Demechko, Bernadette	Secretary, Dean's Office	8-6-90	5-17-91
	Secretary, Mech. Engr. Office	4-5-93	2-29-96
Denny-Schaefer, Carolyn	Secretary, Chem. Engr. Office	9-24-84	
Desko, Debbie (Garchar)	Secretary, Engr. Tech. Office	11-29-79	1-27-84
Dodson, John	Electrical Maint.	7-22-82	
Donovan, Ellen Rose	Secretary, Dean's Office	50	51
Eagleton, Bob	Student Secretary,	65	69

	Dean's Office		
Evans, Bob	Laboratory Maint.	8-10-70	6-3-77
Evans, Wilma	Secretary, Civ. Engr. Office	12-1-69	11-2-75
Fabrizio, Lena	Secretary, Elec. Engr. Office	9-12-84	
Filipowicz, Mary	Housekeeping	6-5-68	5-11-88
Fisher, Sara	Secretary, Engr. Tech. Office	10-3-83	4-20-93
Fullum, Jerry	Machinist	9-14-87	
Fullum, Terry Beronja	Administrative Asst., Dean's Office	9-1-80	
Garchar, Debbie	Secretary (temp.), Civ. Engr. Office	9-29-93	10-4-93
Gomez, Julie	Housekeeping	1-15-59	4-21-82
Hamrock, Jemmy	Secretary (temp.), Mech. Engr. Office		
	Secretary (temp.), Ind. Engr. Office	71	72
Hancock, Jennet	Secretary (temp.), Mech. Engr. Office		
Holisky, Edward	Maintenance Repair	12-12-67	6-30-93
John, Ray	Electronics Maint.	2-26-90	
Jones, Sandra	Secretary, Engr. Tech. Office	1-8-73	8-24-75
Kiktavy, Loretta	Housekeeping	9-24-59	5-30-80
Kish, Kathy	Secretary, Civ. Engr. Office	10-11-93	96
Kleckner, Meredith (Wertzler)	Secretary, Engr. Tech. Office	8-13-75	9-2-83
Krauss, Ron	Electrical Maint.	10-11-93	
Lambert, Paul	Laboratory Maint.	4-21-80	
Laughlin, Rich	Electrical Maint.	5-10-82	
Lewis, Angie	Secretary (temp.), Mech. Engr. Office	12-4-89	3-16-90
Limberty, Barbara	Secretary (temp.), Mech. Engr. Office		
Lutz, Jane	Secretary, Mech. Engr. Office	1-5-70	1-9-81
Marin, Frank	Evening Attendant Dean's Office	50	60
Marrie, John	Electronics Maint.	7-15-68	9-1-72
Mathers, Rosemary P.	Secretary, Chem. Engr. Office	7-13-70	2-26-71
McQuade, Ellen	Secretary, Dean’s Office	8-20-84	
Miglarese, Phyllis	Secretary, Civ. Engr. Office	11-10-75	12-31-91
Mihalenko, Susan	Housekeeping	10-15-63	2-26-88
Millard, Harry	Superintendent, William Rayen Building	52	57
Molnar, Frank	Maintenance Repair	3-11-91	
Nolfi, Bernadette	Secretary, Civ. Engr. Office	10-4-67	11-28-69

O'Connor, Grace R.	Secretary, Dean's Office	4-1-90	7-31-90
Pasquale, Carl	Electrical Maint.	94	
Phillips, Carl	Laboratory Maint.	1-4-82	1-25-91
Pittman, Ron	Maintenance Repair	10-2-67	
Pompanio, Karen	Secretary, Ind. Engr. Office	12-12-84	97
	Mech./Ind. Engr. Office	97	
Potts, Thomas	Electronics Maint.	1-20-87	12-28-89
Pushar, Mary Lee	Secretary, Mats. Engr. Office	8-22-90	
	Secretary, Electronics Maint.		
Repetski, Mike	Director, Electronics Maint.	7-25-69	
Rush, Betty	Secretary (temp.), Dean's Office	3-16-92	5-19-92
Schaefer, Carolyn	Secretary, Chem. Engr. Office	84	87
Schmidt, Jan	Secretary, Engr. Tech. Office	7-14-69	1-19-73
Serrechio, Anna Mae	Secretary, Elec. Engr. Office	9-5-67	6-29-94
Shaffer, Loretta	Secretary, Engr. Tech. Office	8-29-89	
Sheward, Kimberly	Secretary, Chem. Engr. Office	2-16-93	
Shodle, Edward	Laboratory Repair Chem. Engr.	9-1-59	6-26-70
Smiley, Bonnie (Kugler)	Secretary, Engr. Tech. Office	2-20-84	8-8-89
Spencer, Kathy	Secretary, Ind. Engr. Office	67	69
Stewart, Kimberly	Secretary, Chem. Engr. Office	2-16-93	
Thomaskovich, Frances	Housekeeping	11-5-69	5-29-81
Thorton, Jo Ann M.	Secretary, Civ. Engr. Office	69	70
Torok, Anne	Housekeeping	11-21-69	12-9-83
Townes, Ester Price	Secretary, Dean's Office	7-15-67	10- 3-69
Wise, Thomas	Electronics Maint.	9-22-80	1-6-82
Withrow, Debra	Secretary, Chem. Engr. Office	10-20-76	12-28-81
Wolfe, Joe	Machinist	7-25-77	7-31-87
Yoho, Denise Schwab	Secretary, Mech. Engr. Office	2-16-81	3-1-93