Engineering - Central Campus - circa 1920s

Engineering - North Campus - 2000
Engineering Education at Michigan began with a class in civil engineering in 1854. The Engineering Department separated from LS&A in 1895 and was renamed the College of Engineering in 1915. The College has been a leader in establishing new departments in emerging fields, including metallurgy, naval architecture, chemical engineering, aeronautical engineering, nuclear engineering, and electrical and computer engineering. Today the College of Engineering is an international institution with Michigan graduates practicing engineering in every corner of the world.
Alexander Winchell was the first faculty member to teach an engineering course at Michigan. Winchell was appointed professor of physics and civil engineering in 1853, upon the recommendation of faculty member Erastus Haven. His first “engineering course” at Michigan was, in reality, simply an introduction to English composition for engineering students. (Professors at this time frequently designated their courses by an abbreviation of the name of the text used. Since Winchell used a textbook, “Aids to English Composition” by Parker, his first course was entitled “Parker’s Aids.”) The first engineering classes were held in several rooms in South College.

DeVolson Wood is considered to be the true founder of the engineering curriculum at Michigan. He was born in 1832 on a farm near Smyrna, New York, and was a teacher from the age of seventeen until his death at sixty-five. He taught while he attended Albany Normal School and Rensselaer Polytechnic Institute, undergoing great hardship in order to secure an education.

In 1857 he set out for Chicago where he had heard there was a teaching vacancy in engineering. However, when he ran short of money in Detroit, he left his baggage and walked on to Ann Arbor.

Military engineering and tactics were included in the University curriculum in 1861. However, because of the Civil War, no professor was available, so Wood also lectured on these subjects.

Wood felt that the lecture system was a comparatively slow way to learn and should be resorted to only when satisfactory textbooks were not available.

Peck was assistant professor of natural philosophy at West Point in 1846 and of mathematics from 1847-1855, when he resigned from the army. He served as professor of physics and civil engineering in the University of Michigan from 1855-1857. In 1857 he became adjunct professor of mathematics at Columbia and from 1861 held the chair of mathematics, mechanics, and astronomy.

Wood introduced himself to President Tappan. Since Professor Peck was on leave, Wood was asked to substitute for a few days. He rented a room in a boarding house, promising to pay as soon as he was paid. Since Peck did not return, Wood was appointed assistant professor of civil engineering.

Wood proposed, designed, and essentially taught single-handedly a four-year curriculum in civil engineering. This program was offered through a department of engineering established in 1858 within the Literary Department.

Books on engineering were housed in the University Library, and students did most of their reading there.

DeVolson Wood resigned in 1872 to go to the Stevens Institute of Technology, where he taught until his death in 1897. Upon his departure, engineering instruction was guided by three newly appointed faculty, Davis, Greene, and Denison.
The early engineering courses were developed on a foundation of instruction in science and humanities in the Literary College. Instruction in surveying began in the sophomore year, first with classroom exercises based on the primary texts of that time. After two months of classroom exercises, students were then introduced to the practical aspects of surveying through field exercises. The goal was not to make students expert surveyors, but rather to teach them the principles involved in surveying.

Joseph Davis  
Civil

Charles Greene  
Civil

Charles Denison  
Civil & Drawing

Silas Douglas  
Metallurgy & Chemical

William Pettee  
Mining

Stillman Robinson  
Mechanical

Mortimer Cooley  
Mechanical

In October of 1881, an appropriation of $2,500 was made for an engineering laboratory. $1,500 was spent for the building and the balance for equipment. The first Engineering Shop was twenty-four feet by thirty-six feet, constructed of bricks placed edgewise and nailed to the studding. It was the first fireproof building on campus.

1882

1883

"The first little engineering shop was immediately overcrowded; a year or two later we moved alongside it an old wooden building which had been used as a shop for making museum cases when the old museum was built. It had originally been placed where the old Physics Building now stands. It was to be moved off the campus, and I begged it of the Regents, together with the machinery used for making the museum cases." Mortimer Cooley (Scientific Blacksmith, p. 101)

Cooley knew something about blacksmithing and woodworking but not the operation of a foundry. He hired Bob Winslow, who worked at the foundry on Huron Street, to teach foundry practice.

The student used the axe and chains; carried the flag; used the compass, the transit, and the theodolite; computed his work from his field notes; and made a plate of it. Neatness and accuracy in the reports were required. After Land Surveying, the class took up geometrical drawing, tinting and shading. The students worked two hours a day on this subject in the drawing room under the supervision of an instructor. No one was allowed to pass who could not construct his thesis correctly and tint and shade it neatly.

“At the west end of this little building was the forge shop, at the east end was the foundry. On the second floor was the pattern shop and machine shop. Stairs to the second floor were in the northwest corner, with a landing part way up. The little vertical four horsepower engine was in the angle of the stairways. The belt was vertical and passed through the floor to the more than thirty feet of shafting and pulleys at the ceiling of the second floor. The iron lathe was found in the basement of old University Hall and tinkered up for use. I made the wood lathe myself; it had a bed and cone pulleys of wood.

The heating apparatus was an old fashioned regulator stove with a removable top. A forge was built, and a small cupola erected. The cupola, twenty inches in diameter and five or six feet high, was on the east side of the chimney in the center of the building. Notwithstanding its size it worked well, and many castings in molds fashioned from patterns were made on the floor above.” Mortimer Cooley (Scientific Blacksmith, p. 104)
By 1885 additional space was needed for Engineering. The first unit of the permanent brick Engineering Shop was built on the east side of the original laboratory (the Scientific Blacksmith Shop) and connected with it by a passage-way at the second-floor level.

Within two years an expansion was needed. The new addition contained offices, classrooms, drawing rooms, and laboratory for testing machines, steam engines, water motors, and strength of materials. On the west end was a one-story foundry and forge shop.

The early courses in mechanical engineering were concerned largely with the design of machinery and with the technology of the workshop. Practical instruction took place in shops rather than the laboratory. The early emphasis on shop work was typical of the schools’ desire to make their training as practical as possible, as was the tendency of engineering teachers to demonstrate their competency by undertaking collateral practice.

When the University Library was torn down to make way for the New Library, Mortimer Cooley asked for the clock and chimes to be put in the Engineering Shops Tower. The clock and chimes rang at 8:00 a.m. and 6:00 p.m. to signify the beginning and end of the study day. When Burton Tower and the Baird Carillon were finished in 1936, the clock and chimes had outlived their usefulness.

The Engineering Shops were used for over forty years, despite being condemned many times as a fire trap. In 1937 it was damaged by two fires in the laboratories. The building was torn down in 1956 when the new automotive laboratory was completed on the North Campus. The Undergraduate Library was built on the site.

With growing enrollments in Engineering came the need for more space. In 1891 the engineers were given the use of the building vacated by the Dental College when it moved into the former quarters of the Pavilion Hospital on North University. This building had been one of the original Professors' Houses.

A third story was added, the entrance moved to the west side of the new part and the word “Engineering” was placed over the doorway. There were fifteen classrooms and several offices. The building was used until 1922, when it was removed to make room for the Clements Library.
In 1895 Engineering was separated from the Department of Literature, Science and the Arts and became an independent department. Charles Greene and Mortimer Cooley were reluctant supporters of the separation, believing that the engineer's education should be as broad as possible and fearing that the separation would tend to narrow it. In April of 1895 the Regents resolved that “A School of Technology be organized, comprising the Departments of Civil, Mechanical, and Electrical Engineering, and that Professor Charles E. Greene be appointed Dean.”

Mortimer Cooley succeeded Charles Greene as Dean of Engineering in 1903. Cooley was the key player in the rapid progress of the College of Engineering during the early decades of the 20th Century. During Cooley’s tenure at Michigan both as a faculty member and then dean, enrollments in the College grew from less than 30 to more than 2,000, the faculty increased from three instructors teaching several courses to more than 160 professors and staff teaching hundreds of courses, and a temporary shop of 1,720 square feet expanded to over 500,000 square feet of well-equipped buildings.

In 1895, as the need for additional facilities became apparent in the face of expanding enrollments, Charles Greene, the Dean of the Department, was asked to draw up plans for a new building. He suggested a small U-shaped structure costing about $50,000. However, before his plans could be enacted, he died and was succeeded by Mortimer Cooley. Merely as a matter of form, Cooley was asked his stand on the building program. He replied: “Gentlemen, if you could but see the other engineering colleges with which we are forced to compete, you would not hesitate for one moment to appropriate a quarter of a million dollars.” They did, and the New Engineering Building was the result (Michigan Technic, December, 1929).

In 1902 construction began on the four-story structure known for years as the New Engineering Building and later renamed West Engineering. The building was completed in 1903 and opened for classes in the fall of 1904.

The New Engineering Building was planned for 600 students. By the time the building opened there were 828 students, and the new facility was almost immediately overcrowded.

In 1910 the Building was extended one hundred feet over the Naval Tank, as was provided in the original plans. The Naval Tank in the New Engineering Building was the only one in this country, aside from the government’s tank in Washington, D.C. Equipment was available for studies relating to ship resistance, shallow-water effect, streamline flow, wave profiles, wake, and rolling, as well as a model room and workshop for making models of vessels.

The famous “Engineering Arch” in the New Engineering Building was the contribution of an engineering professor, Charles Denison. When he learned that architects were struggling to design the building without interfering with the diagonal walk of the campus, he prepared a sketch showing the diagonal walk passing through an archway in the building. In his honor it was named “The Denison Archway,” and it later became known as the “Engineering Arch.”
In 1922, as a stopgap measure the University purchased the old Tappan School building on East University, renamed it East Hall, and gave it to Engineering to house its classes in non-technical subjects such as Engineering English. This old building had been constructed in 1883 as a city school. The name “Tappan School” remained on its north face. It was condemned for elementary school purposes by the state fire inspectors in 1922 and thus became available to the University.

The University responded to the needs of the College with plans for a large new building named East Engineering. Although this was originally envisioned as a monumental structure designed to meet the needs of the College for decades to come, the final plans were far less ambitious and would require further expansion in later years. Thirty houses on the property were removed to accommodate the East Engineering Building. They were moved to other locations so that the University building program would not contribute to the loss of housing in Ann Arbor.
In the fall of 1941, just prior to World War II, the College was thought to have reached its enrollment capacity at 2,070. Yet as the war ended and veteran students returned, the College’s enrollment had grown to over 4,500 by 1947, including 2,967 veterans. The dilemma facing the College was familiar: Either reduce enrollments or build new facilities. In 1944 the University conducted an exhaustive study on how to meet the needs of the veterans returning to college from wartime service. The report stated that “The University of Michigan commits itself to the proposition that the educational needs of war-service veterans and, hence, of the community must be met to the fullest extent its facilities will allow.” A plan was developed for a major expansion of the Engineering campus to meet the anticipated enrollment growth. This plan, shown below, envisioned the development of an “Engineering Quadrangle” to the east of the campus, along with a major expansion of West Engineering (Michigan Alumnus, December 18, 1943, p. 183).

Although the University did not have the capacity to launch the massive plan developed in 1944, it did commit the funds to expand East Engineering.

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**Post War Planning**

The “Engineering Quadrangle” West Engineering (blue), East Engineering (green)
The orange buildings are the additions and new proposed buildings.

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1947

**East Engineering Addition**

The new addition opened in 1947 to house the Departments of Electrical and Aeronautical Engineering. Naval Architecture and Civil Engineering took over the vacated space in West Engineering.
The first Engineering building to be completed on the North Campus was the Cooley Memorial Laboratory in 1953, named in honor of Mortimer Cooley, dean of Engineering from 1903 - 1928. Much of the classified research associated with Willow Run was conducted in the Cooley Laboratory.

Although the College of Engineering was the first major University academic unit earmarked for moving to the North Campus, this objective was soon set aside in preference to other University priorities. First, the School of Music was given a major new complex on the North Campus in 1964, followed soon afterwards by the School of Architecture and Design, the North Campus Commons in 1965, and the Chrysler Center for Continuing Engineering Education in 1971. The University also located other major research facilities on the North Campus, including the Cyclotron Laboratory (Physics), the Institute of Science and Technology in 1963, and the Highway Safety Research Institute in 1965.
In the 1970s the College launched a major fund-raising campaign. The intention was to combine the proceeds with a match from state funding to complete Engineering’s move to a new four-building complex on the North Campus. In this four-building plan, the largest building, Engineering Building I would house Mechanical Engineering and Applied Mechanics, Civil Engineering, Industrial and Operations Engineering, Humanities, and the College administration. Engineering Building II would contain Chemical and Metallurgical Engineering. Engineering Building III would be for Electrical and Computer Engineering and Nuclear Engineering, and Engineering Building IV would be for Naval Architecture (with a possible new towing tank on the North Campus).

Amid great anticipation of the move to the North Campus, this ad appeared in the Michigan Technic, in February, 1974.

The sketch to the left shows the location of the proposed new buildings.

The fund-raising campaign was only a modest success because of the weak American economy during the 1970s. It raised only $8 million for facilities, an amount inadequate to trigger the North Campus move. With inflation rapidly eroding the funds raised during the campaign, the College decided to direct the entire amount (and then some) to the construction of the Herbert H. Dow Building (Building II) and defer indefinitely any further effort to continue with the rest of the four-building project. The College approached the 1980s with only a very modest presence on the North Campus: several research buildings, a modest concrete block building for Aerospace Engineering, another small building for the water resources program, and the construction site for the Dow Building.

After a thorough review of the existing plan to move the College into four new buildings, funded from state and private sources, Jim Duderstadt, then dean of Engineering, concluded that in the current climate this plan was clearly both impractical and unworkable. A far more modest plan was proposed to the University administration, based upon the reassignment and renovation of several existing North Campus structures and a single new, state-funded building for Electrical Engineering. This pragmatic yet workable plan was to result in the move of the entire College of Engineering to the North Campus by 1986 and lay the foundation of what would eventually become one of the finest campuses for engineering education in the nation.
The remaining facilities needed to complete the Engineering Campus included the Francois-Xavier Bagnoud Building (FXB) for aerospace engineering, the Lurie Engineering Center, and the Media Union, a remarkable digital library and multimedia center. Further, the eminent American architect and University alumnus, Charles Moore was commissioned to design a striking carillon, the Robert H. and Ann Lurie Tower, that soon became the symbol for the North Campus.
The Engineering Campus Continues to Grow to Accommodate 7,600 Students

Integrated Technology Instruction Center - Media Union 1996 (Renamed The James and Anne Duderstadt Center in 2004)

Robert H. Lurie Engineering Center 1996

Fountain and Reflecting Pool Gift of the Class of 1947

Robert H. and Ann Lurie Tower 1996

Lurie BioEngineering 2005

Computer Science & Engineering 2006

Carl Gerstacker Building 2003