

College of Engineering, Architecture and Technology

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The professionals and semi-professionals who will be largely responsible for the shape of the world in the year 2000 and beyond are just starting their higher education. The power they will exercise makes an exciting prospect and presents a sobering responsibility. Many of the easy problems that are usually solved first are now a part of history. Many difficult problems remain. The need for well-qualified and well-trained people is obvious; one will be embarking on a lifetime of challenge if he or she decides to prepare for a career in engineering, engineering technology or architecture while at Oklahoma State University.

Most of the work of engineers, technologists and architects is concerned with the conception, design and fabrication of devices and installations, and processes and systems that serve human needs. This work provides ample opportunity to express creativity. It requires an ability to make decisions.

Engineers and architects, working side by side and supported by technologists, constitute one of the most powerful agents for change in our society. New ways are found to control the environment, to utilize the resources and forces of nature, to increase productivity of needed goods, and services, in short to improve the quality of life for all.

The College of Engineering, Architecture and Technology (CEAT) offers a complete spectrum of educational opportunities designed to give graduates the capability and the flexibility to meet the ever-changing requirements of our society—a society heavily committed to technological innovation. To be prepared to make continuing contributions, engineers, architects and technologists must have at their command not only the modern tools and processes of industry, but a firm and rigorous education in mathematics and the physical sciences. In order that those contributions be sensitive to genuine human needs, the engineer, architect or technologist must also be schooled in the social sciences and humanities that provide the understanding of non-technical factors that must shape technological innovation.

The curricula are continually evolving to assist the student first to master the enduring principles upon which future practice will be based, and second to acquaint him or her with current applications of these principles. With such a bridge built



between theory and practice, the educational experience will support one's following diverse interests and opportunities throughout the productive years of his or her life span.

Accreditation

The following undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET):

Architectural engineering
 Agricultural engineering
 Chemical engineering
 Civil engineering
 Electrical engineering
 General engineering
 Industrial engineering and management
 Mechanical engineering
 Mechanical engineering (aerospace option)

The following undergraduate engineering technology programs are separately accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology:

Construction management technology
 Electronics technology
 Fire protection and safety technology
 Manufacturing technology
 Mechanical design technology
 Mechanical power technology
 Petroleum technology

The following programs in architecture are accredited by the National Architectural Accrediting Board:

Bachelor of architecture
 Master of architecture

The Engineering Curricula

The traditional four-year bachelor's degree programs in engineering remain available at OSU. However, in order to meet the ever-changing and complex needs of a technological society, one who expects to enjoy a lasting and successful career in the practice of engineering should obtain a background in mathematics, the basic sciences and in engineering that cannot readily be acquired in four years. To meet this primary objective of an engineering education, the Schools of Engineering encourage every qualified student to pursue a curriculum leading to a master's degree over a period of approximately five years, even though it is expected that there will be many entry-level job opportunities available for the graduate with the bachelor's degree. Furthermore, the bachelor's program in engineering is an excellent preparation for professional training in law or medicine, since it provides a student with maximum flexibility in career choices.

Academic Programs

Academic programs offered in the College of Engineering, Architecture and Technology culminate in the following degrees:

Schools of Engineering:

Bachelor of Science in Agricultural Engineering, Chemical Engineering (petroleum and pre-medical options), Civil Engineering, Electrical Engineering (computer engineering option), General Engineering, Industrial Engineering and Management, Mechanical Engineering (aerospace, petroleum and premedical options).

Master of Agricultural Engineering, Environmental Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, General Engineering, Industrial Engineering and Management, and Mechanical Engineering.

Master of Science in agricultural engineering, engineering, chemical engineering, civil engineering, electrical engineering, environmental engineering, general engineering, industrial engineering and management, and mechanical engineering.

Doctor of Philosophy in agricultural engineering, chemical engineering, civil engineering, electrical engineering, general engineering, industrial engineering and management, and mechanical engineering.

Division of Engineering Technology:

Bachelor of Science in Engineering Technology.

School of Architecture:

Bachelor of Architecture, Bachelor of Architectural Engineering, Master of Architecture and Master of Architectural Engineering.

High School Preparation

Beginning students who have completed two units of algebra and one each in plane geometry and trigonometry/analysis in high school should be prepared to enter at the expected level in mathematics. In addition, it is recommended that students planning an engineering degree obtain high school credit in one unit of general chemistry, one unit of general physics as well as one-half unit of graphics, if available.

Oklahoma State University offers course work in algebra, trigonometry and preparatory chemistry for students who were unable to obtain this work during high school. However, such credit does not count toward the minimum number of semester hours specified for the B.S. degrees.

The selection of the initial chemistry and mathematics courses for an entering student in the College of Engineering, Architecture and Technology is determined by his or her score on placement tests administered at enrollment, the amount of mathematics or chemistry completed in his or her high school program and ACT test scores. When appropriate, students with a strong background can obtain academic credit by advanced standing examination or by College Level Examination Program (CLEP) tests.

The Professional School Concept

In accord with the professional nature of a career in engineering, students entering OSU are admitted into the pre-engineering program, consisting of the course work normally taken the first two years of an engineering curriculum. Near the completion of the pre-engineering course work, the student applies for admission to one of the professional schools of the College to continue in the upper-division program. Students meeting admission standards then pursue a two-year curriculum leading to the B.S. degree or a three-year curriculum leading to a master's degree in their discipline.

Pre-engineering Program. The pre-engineering program is comparable to the freshman and sophomore levels in other disciplines. The content of the pre-engineering program is uniform for all engineering specialties except architectural engineering, and includes course work devoted to mathematics through calculus and differential equations, communication skills, general chemistry, general physics, the engineering sciences commonly referred to as mechanics, thermodynamics and electrical science, and the social sciences and humanities.

Admission Requirements

Admission to Pre-engineering. In order to maintain a high quality, the professional school concept for admission to the engineering and architecture programs is utilized. Students must first be admitted to the pre-engineering or pre-architecture program and complete certain minimum requirements as outlined under "Lower Division Requirements" in order to be considered for admission to a professional school and allowed to pursue the upper-division curriculum. Transfer students are normally first admitted to pre-engineering regardless of the number of hours



completed but may be permitted to take selected upper-division courses prior to admission to a professional school as appropriate.

Oklahoma residents may be admitted to pre-engineering, pre-architecture or technology if they meet OSU admission requirements stated elsewhere in the *Catalog*.

Nonresident students applying for admission to pre-engineering as freshmen must meet the following requirements:

Make a composite standard score of 19 or higher on the ACT or a comparable score on a similar battery of standardized national exams. When it is not practical to take such exams (e.g. international students), the student's high school grades should demonstrate comparable competency and the potential for success in an engineering major.

Nonresident freshmen not directly admissible to pre-engineering but those who meet OSU requirements for admission may be admitted to Freshman Programs and Services for one or two semesters in order to fully evaluate their qualifications for admission to pre-engineering. After grades are received each semester, such students will be evaluated and, if qualified, will be admitted to pre-engineering.

Minimum requirements for admission to pre-engineering from Freshman Programs and Services are:

1. an overall grade-point average (GPA) of 2.30, and
2. a GPA of at least 2.30 at OSU in mathematics, physical science and English courses applying toward the degree, and
3. ability to make satisfactory progress toward an engineering degree.

Nonresident transfer students will be admitted directly to pre-engineering if they meet the following requirements:

1. an overall GPA of at least 2.70 on a 4.00 scale, and
2. a GPA of at least 2.50 over all mathematics, physical science, engineering science and engineering courses, and
3. a GPA of at least 2.00 (in at least 12 hours if a full-time student) in the most recent semester completed, and

4. ability to make satisfactory progress toward an engineering degree.

International student applications must be received by June 15, November 1 and April 1 for the fall, spring and summer terms, respectively, to be considered for admission to pre-engineering. All GPA's are calculated using only the last grade in any repeated course.

The College of Engineering, Architecture and Technology, in implementing the policy for admission to engineering programs at Oklahoma State University, provides special consideration for members of U.S. minority populations, veterans, and educationally or economically disadvantaged citizens who show reasonable promise for successful completion of the undergraduate engineering curricular requirements. All special admissions under these exceptions will be approved by the Office of the Dean of Engineering to ensure that the policy will not affect adversely the admission of students from minority backgrounds. Transfer students will not be admitted if in their most recent semester of transfer credit their performance would have them on probation if enrolled at Oklahoma State University. Students transferring to pre-engineering from another major at OSU must meet the same requirements for admission as a student transferring from another college or university.

Admission to the Professional Schools. A student who will have completed, including his current enrollment, not fewer than 60 semester credit hours of study at an accredited institution of higher learning, and who has demonstrated satisfactory competence in the pre-engineering curriculum described above, is eligible to apply for admission to the professional school of his or her choice. The requirements for such admission are described in detail under "Lower-division Requirements."

In addition, if the number of qualified professional school applicants to a given professional school exceeds the number that can be provided a quality program with the resources available, the number admitted each semester to that professional school will be limited. In that event, priority for admission will be given first to Oklahoma resident pre-engineering students and second to the nonresident students in pre-engineering on a best qualified basis as determined by the grade-point average in courses taken and completed at OSU.

This practice will preserve the high standards demanded of a quality educational experience sought by students and necessary so that OSU graduates will continue to be highly regarded.

A common prerequisite for any student to enroll in upper-division course work offered by the professional schools of the College is competence equivalent to that required for admission to the schools, as described above. For students who have not been admitted to a professional school, competence will be evaluated on an individual basis by the head of the school or a designated representative.

Master of Engineering

The Master of (specific school) Engineering degree programs are designed to prepare the graduate for the practice of the engineering profession in industry and government. They are distinguished by particular emphasis on developing in students the ability to perform effectively in design and development work; the programs normally include internship experiences as a part of the academic process. Approximately one year of graduate study is taken at the culmination of these programs offered in the Schools of Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, General Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering.

Admission to one of these programs depends upon being accepted by one of the professional schools in the College of Engineering, Architecture and Technology (CEAT). The programs consist of undergraduate work corresponding to the junior and senior level, and a 32-semester-credit-hour study program in graduate-professional status meeting Graduate College requirements for a Plan III master's degree.

Students may enter a professional school at any level for which they are qualified that exceeds the minimum requirements for eligibility for admis-

sion to a professional school. (See "Admission to Professional Schools.")

To be admitted to graduate-professional status in a professional school in the CEAT, a student must have completed a curriculum leading to a B.S. degree in engineering meeting the requirements of the Accreditation Board for Engineering and Technology. Students with B.S. degrees in physics, chemistry, etc., must complete work to meet ABET undergraduate requirements before gaining graduate-professional status. Scholastic performance as an undergraduate at a level that indicates a high probability of success in a graduate program requiring a 3.00 minimum GPA on a 4.00 scale is also a requirement.

The 32 semester hours in graduate-professional status combine with 68 or more semester hours of upper-division work to total at least 100 semester hours beyond the pre-engineering level for the professional programs. This course work is taken in accordance with a professional school plan of study established for each student to meet the objectives of the student and the professional school in which he or she is enrolled. Three-year plans of study will include: 16 semester hours of required courses common to all engineering curricula; not fewer than 36 semester hours of additional engineering work specified by the particular professional school, and of these, at least 15 semester hours must be at the 5000 level, exclusive of professional practice; and six to eight hours of professional practice in the graduate year of the plan of study. The courses should be chosen at both undergraduate and graduate levels to meet ABET basic and advanced requirements for course work that is classified as design. (Currently, one-half year of engineering design is required in the basic, i.e., undergraduate programs, and an additional one-third year in the advanced portion.)

The professional school plan of study serves as the preliminary plan of study for the graduate portion of the program, but a separate final plan of study must be filed with the Graduate College by the end of the second week of the term during which all requirements for graduation are to be completed.

Scholarships

Several scholarships are funded through private donations, alumni gifts, and industries, and vary in amounts from \$400 to \$1,250 per year.

These scholarships are available for freshman through senior students, and are awarded primarily on the basis of academic achievement and leadership potential. However, during the selection process consideration may be given to financial need and other factors. Freshman students should normally have an ACT composite score of 30 or higher and be in the top 10 percent of their high school graduating class to be competitive for CEAT scholarships.

Each school or department within the College normally has scholarship funds available. These are administered through that school or department rather than through the College's scholarship committee. However, a separate application form is not required.

Application forms and information regarding CEAT may be obtained by contacting the Office of Student Academic Services, CEAT, EN 101, OSU, Stillwater, OK 74078.

Freshman scholarship applications must be completed and on file by March 1 preceding the academic year for which the student expects to receive the scholarship. Applications should be

submitted to the Office of Student Academic Services.

Continuing and transfer students should submit scholarship applications to the head of the school in which they are majoring prior to May 1. In this manner they will also be considered for any departmental scholarships for which they may be eligible as well as for any CEAT scholarship. Students who have not selected a major should submit their applications to the Office of Student Academic Services.

Academic Advising

The College's Office of Student Academic Services provides advisement for all pre-engineering students and pre-architecture students. (Consult the heading "Division of Engineering Technology" for specific information regarding advisement for students in technology programs.) When a student has gained admission to a professional school of engineering or architecture, he or she will be assigned a faculty adviser.

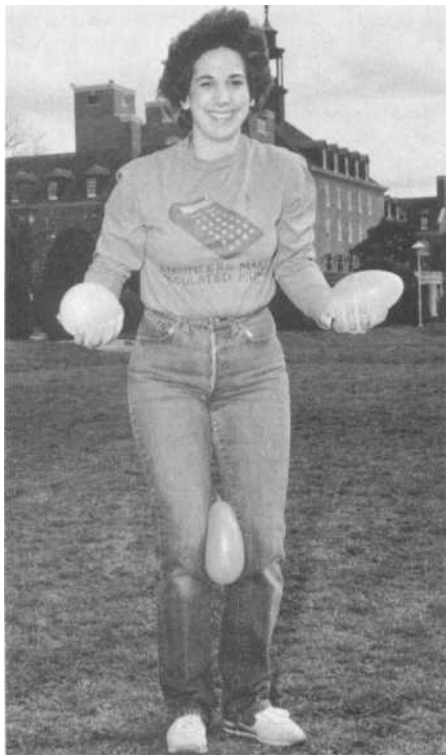
Each student is personally advised in the planning and scheduling of his or her course work and is counseled and advised individually on matters of career choice, his or her activities at OSU, and on other academic matters. An academic file is created for each student at the time of initial enrollment.

Progress Toward a Degree

Full-time students are expected to complete twelve or more semester credit hours each term with a grade-point average of 2.00 or above to make satisfactory progress toward a degree. Should either the hours completed or grade-point average for any term fall below the minimum, the student may be placed on academic probation.

Probation and Suspension

1. Students in the CEAT will be placed on probation at the end of any academic term in which they fall below the criteria for satisfactory progress toward their degree objectives.
 - a. the conditions for satisfactory progress in an academic term are:
 1. at least a 2.00 GPA, and
 2. at least 24 grade points (12 in a summer term) for a full-time student in courses which apply toward the degree objective. Part-time students must make at least a 2.00 GPA.
 - b. Students placed on probation following the fall semester will be subject to suspension following the spring semester. Probation terms are set on an individual basis but normally require at least a 2.00 GPA in at least 12 hours which apply toward the degree for full-time students.
 - c. Students placed on probation following the spring or summer terms will be subject to suspension at the end of the following fall or spring semester depending on the student's academic record. Probation terms normally required of full-time students on probation for the academic year are:
 1. at least a 2.00 GPA in at least 12 hours which apply toward the degree objective in the spring semester, and
 2. at least a cumulative 2.00 GPA for the academic year, and



- 3 successful completion of at least 24 hours total which apply toward the degree objective for the fall and spring semesters while on probation. Students on probation for the fall semester only must meet requirements as stated in (b).
2. A student will be subject to suspension at the end of any term in which he or she fails to meet University retention standards. (See "Academic Regulations" in the *Catalog*.)
3. A student will not normally be suspended who is within 24 semester credit hours of graduation.
4. Students who have been reinstated will be suspended at the end of any semester in which they fail to meet probation requirements.
5. Students who have been suspended for both reasons of unsatisfactory progress toward the degree and of academic dishonesty will not be reinstated in the College of Engineering, Architecture and Technology.
6. An effort will be made to appropriately advise students on probation of their academic status at the end of every academic term, but they are responsible for being aware of their academic status and for taking appropriate action.
7. Students on probation will be required to sign an acknowledgement of the terms of their probation. Students will be held subject to the terms of probation established by their advisers whether or not they see their advisers and sign the acknowledgement of the terms of probation.
8. Students on probation will not be allowed to enroll for the term following the end of the probationary period until grades are received verifying that probation requirements have been met.

Reinstatement

Any student who has been suspended from the University for academic reasons may apply for reinstatement by making application through the Office of Student Academic Services in the college in which the student wishes to be reinstated. Students in the CEAT should obtain a copy of CEAT reinstatement procedures to seek reinstatement.

A suspended student who is reinstated will return to school on academic probation and will be subject to the probation procedures above.

Concurrent Enrollment

If a student expects to apply credits toward a degree at OSU that are to be earned at another institution or through correspondence or extension, while enrolled in one of the programs of the College of Engineering, Architecture and Technology, permission must be obtained in advance. It is the belief of the faculty of the College that such enrollment detracts from the educational process at this institution, and can be justified only in the most unusual circumstances. Normally, if the material for which such permission is sought is available at OSU, permission will not be granted, nor will retroactive permission be granted in any circumstances.

Calculators

An engineering, architecture or technology student is expected to be equipped with an appropriate calculator or computer. Any student not so equipped will be at a disadvantage in learning activities. Necessary functions include exponential functions, the logarithm and inverse logarithm

functions in both natural base and base 10, and the trigonometric and inverse trigonometric functions.

Special Academic Programs

Co-op Program. The College of Engineering, Architecture and Technology offers an experience-based program, Cooperative Education (Co-op). Co-op allows engineering and technology students to achieve a balanced education through the combination of theoretical and practical knowledge during their early years of professional development. The student's education is a cooperative effort between the University and industry. Students alternate semesters on campus with work semesters in industry during their junior and senior years. The periods of employment constitute an essential element in the educational process. Students gain practical knowledge which is carried back to the classroom, giving academic programs a sense of reality. By the time they receive their degrees, students have accumulated the equivalent of a year-and-a-half of progressively challenging work experience.

Participation in Co-op is voluntary; transfer students must successfully complete at least one semester at OSU prior to their first placement. Students may obtain further information about the program from the coordinator, Room 101A, Engineering North.

Engineering Honors Program. The Honors Program provides opportunities for challenging and individual study for undergraduate students of unusually high ability, motivation and initiative. Honors classes, seminars and independent study courses are structured to put interested students and teachers together in ways which encourage discussion and a mature approach to learning. Invitation to the program is extended only to approximately the top five percent of entering students.

Each honors course completed with an "A" or "B" grade is identified on the student's transcript as such. A special bachelor's degree

Honors diploma is conferred upon graduation for successful completion of all Honors Program requirements.

Qualified high school scholars will be eligible for the Honors Program beginning with their first enrollment at OSU as freshmen. An ACT composite score of at least 30 is required for Engineering and Architecture Honors students and at least 26 for Technology Honors students.

All other OSU students and transfer students who are classified as freshmen (27 semester credit hours or fewer), and who have completed twelve or more hours with a grade-point average of 3.50 or above are eligible to join the Honors Program regardless of their ACT scores.

Requirements for a Bachelors Degree with Honors. (1) A grade-point average of 3.50, both overall and in the major field. (2) A total of 12 semester credit hours with grades of "A" or "B" in honors sections of basic introductory-type courses from at least three of the following areas: English or foreign languages, mathematics or logic, social sciences, natural or physical sciences and humanities. (3) Honors credit with grades of "A" or "B" in a total of 12 semester hours of junior and senior courses within the student's major field, including at least three hours of independent study. (4) Acquisition and submission of a formal application for the Honors degree within two weeks after the beginning of the final semester.

Job Placement. An employment service is provided for students in the College. This service is available to students interested in obtaining summer or permanent employment.

The placement office is coordinated with the University Placement Office and assists students in signing up for interviews with companies interviewing on campus. Lists of employment opportunities with companies not recruiting on campus are maintained at all times. Resources are available to assist the student seeking employment including company literature, resume information, interviewing tips and placement annuals.

Placement orientation sessions are held at the beginning of each semester to familiarize the students with the services provided.

Tutoring Program. A tutoring program is provided to assist students in their understanding of fundamental courses in mathematics, physics, chemistry and engineering science.

The sessions are held each fall and spring semester Monday through Thursday evenings. Each session lasts 30 minutes and the student is charged a nominal fee. Students may sign up for a maximum of one hour per evening if they wish.

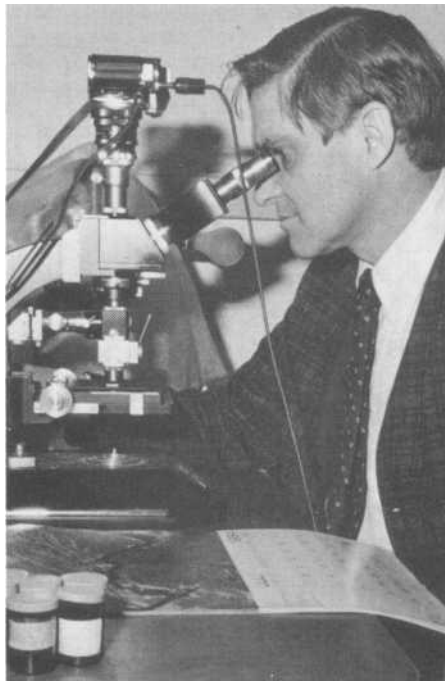
Information about the program can be obtained in the Office of Student Academic Services.

General Education Requirements

The College of Engineering, Architecture and Technology urges its students to make maximum use of the course work required by the College and the schools for simultaneous fulfillment of many of the general education requirements.

Opportunities to satisfy General Education requirements with required courses in the schools of Engineering include:

English. Students are required to complete a course in technical report writing. Thus, students making an "A" or "B" in the first English composition course (ENGL 1113), need not take ENGL 1323, and may take the report writing course,



ENGL 3323, to meet both the general education requirement for English and the College requirement.

Humanities and Social Science. Engineering students must complete a total of 16 semester credit hours to meet this requirement, which is in compliance with the minimum requirements stipulated by the Accreditation Board for Engineering and Technology. By taking American history and political science to meet general education requirements, three or four additional hours of social and behavioral science, and six or seven hours of humanities, the 16 hours can meet the University's requirements in these areas. Furthermore, if one of these courses is selected from those meeting the University's requirements for an International Dimension, the total number of hours for the degree can be held to the minimum.

Basic Science and Mathematics. All students are required to complete 32 semester credit hours in these areas to meet college requirements. Eighteen of these credits can be used to meet University requirements in Natural Science and in Abstract and Quantitative Thought. The required chemistry and physics course work meet the University requirement for Scientific Investigation.

The total college requirements amount to 54 semester hours, well over the 40 hours required by the University for general education. However, no more than 18 of the 32 hours in mathematics and science can be counted toward General Education, and several hours of the course work are more advanced than what would normally be approved for General Education.

Opportunities for simultaneously meeting the requirements imposed by the School of Architecture and General Education requirements parallel those of the schools of Engineering with some variations. Specific courses, required in the Architecture curriculum, may be used to meet General Education requirements as follows: Urban Sociology (SOC 3423) can be used to meet the minimum requirements in Social and Behavioral Science, and Architecture and Society (ARCH 2003) can be used to satisfy three credit hours of General Education credit in the Humanities as well as the International Dimension requirement. At least 17 semester hours of basic science and

mathematics can be counted toward General Education requirements, and required course work in "History and Theory of Architecture" can be used for General Education credit, except that at least one General Education course unrelated to the major must be included.

The pattern for meeting General Education requirements with course work also meeting departmental requirements is similar in the Division of Engineering Technology, but with some variations from department to department. Required course work in mathematics and basic science is utilized to meet up to 18 semester hours of General Education requirements also. The Scientific Investigation requirement is met as a part of the course work meeting professional requirements for basic science.

Meeting the remaining General Education requirements is not influenced by departmental requirements. In each case, provision is made for an elective to complete the minimum 15 semester credit hours in course work not directly supportive of the major. These hours, and the required hours in the Humanities (H) and Social and Behavioral Studies (S) areas provide an opportunity for the student to also meet the International Dimension requirement without adding hours to the program.

Lower-division Requirements

In the Schools of Engineering and the School of Architecture the lower-division course work is devoted to qualifying for admission to the associated upper division; i.e., in each case continued progress in the program is contingent on successful completion of lower-division course work measured against standards that are considerably higher than University retention standards.

Engineering. Admission to a professional school. A student is eligible to apply for admission to one of the professional schools of Engineering when the classes in which he or she is enrolled will bring his or her total semester credit hours of course work at an accredited institution of higher learning to at least 60 hours. Admission to the professional school is the demonstration of an acceptable level of competence in subject matter comparable to that covered in the General Education and Pre-Engineering components of the lower-division curriculum as described in detail in the publication, *Undergraduate Programs and Requirements* and acceptance by the appropriate professional school. The demonstration of competence is normally in the context of formal course work, but up to one half of the requirements may be completed by examination.

An acceptable level of competence for the purpose of admission to a professional school may be demonstrated by achieving all of the following:

1. Of the 60 or more semester credit hours, at least 51 shall be from the General Education and Pre-engineering courses specified for the degree. The minimum grade-point average in these 51 hours is 2.30, and final grades of "C" or better are required in each English, mathematics, physics, chemistry or engineering science/engineering course.
2. A minimum of 12 of the required semester hours must be completed at Oklahoma State University, with a grade-point average of 2.30 or better in these courses.
3. The overall grade-point average applicable to the mathematics, physics and chemistry courses, and those engineering science and

engineering courses taken prior to admission to a professional school, should equal or exceed 2.50.

While 60 semester hours are specified for the common pre-engineering curriculum, in some cases, preliminary courses pertinent to an individual major are recommended to be taken in the sophomore year. When such courses are taken, it is understood that pre-engineering course work may be deferred to the junior year. Furthermore, individual schools may impose higher standards for admission. Consult the *Undergraduate Programs and Requirements* or the particular requirement sheet for these details.

Architecture. Admission to the upper division (third year) in the School of Architecture is granted to the most qualified applicants up to the capacity of the program. However, to be considered, a student must have completed 60 semester credit hours, all required architecture courses specified for the first two years with grades of "C" or better, and maintained an overall GPA of 2.30 or better. Furthermore, first preference will be given to students who have completed ARCH 2114 prior to admission.

Technology. The specific requirements for continuation beyond the lower division in the various majors in the Division of Technology are not uniform. Programs may have stipulations regarding admission to the upper division. Attention is directed to the requirement sheet for the appropriate major or the publication *Undergraduate Programs and Requirements* for the specific conditions a student must satisfy.

Departmental Clubs and Honor Societies

- Alpha Epsilon (juniors & seniors in agricultural engineering)
- Alpha Pi Mu (honor society for juniors & seniors in engineering)
- Amateur Radio Club
- American Institute of Architects
- American Institute of Astronautics & Aeronautics
- American Institute of Chemical Engineers
- American Institute of Industrial Engineers
- American Society of Agricultural Engineers
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- CEAT Student Council
- Chi Epsilon (civil, architectural or general engineering honor society)
- Construction Management Society
- Construction Specifications Institute
- EngineerSts (spouses of students in CEAT)
- CEAT Student Council
- Eta Kappa Nu (electrical engineering honor society)
- Fire Protection Society
- Institute of Electrical & Electronics Engineers
- Omega Chi Epsilon (chemical engineering students)
- Pi Tau Sigma (mechanical and aerospace engineering honor society)
- Society of Automotive Engineers
- Society of Black Engineers, Technologists & Architects
- Society of Electronic Electrical Power Technology
- Society of Manufacturing Engineers
- Society of Mechanical Technicians
- Society of Petroleum Engineers
- Society of Women Engineers
- Tau Alpha Pi (technology honor society)
- Tau Beta Pi (engineering students honor society)
- Tau Iota Epsilon (technology students)





Agricultural Engineering

Professor and Head David R. Thompson,
Ph.D.

Agricultural engineers are professional people who generate and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of agricultural, food and other biological products, and the management of natural resources.

Agricultural engineering utilizes basic engineering expertise, but focuses this knowledge on the invention, design and management of biological systems. The opportunities for agricultural engineers are as diverse as flood control, equipment design for food production and processing, design and management of processing facilities, and environmental control for plants and animals. Agricultural engineers develop and utilize machine vision systems for quality control, expert systems for process and machine optimization, unique machines for efficient manufacture or production of food, forest products and other biological materials, and environmental control system for aquaculture, disease control or indoor plant production.

The problem-solving ability and broad-based engineering background of agricultural engineers make them well suited for activities such as research, development, design, production, management, technical sales and private consulting. The additional background in biological sciences provides graduates excellent opportunities for entering other professional schools, such as medicine, dentistry, veterinary medicine, biological sciences or agricultural programs. Many opportunities exist for international work in both developed and developing countries.

Agricultural engineering courses for juniors and seniors integrate the engineering sciences with agricultural and biological sciences and teach students to design solutions to real problems of society. Students work both as individuals and in teams

to solve design problems provided by industrial firms who also hire agricultural engineering graduates. Students receive specialized design experiences in one or more of the following areas: hydrology and water resources, including flood control, irrigation, and water supply; machinery, instruments and controls for farming and ranching, food processing and packaging, and production of biotechnology products; and systems for efficient production, processing, handling and storage of agricultural and biological products.

Graduate Programs

The School of Agricultural Engineering offers three programs leading to post-baccalaureate degrees: Master of Agricultural Engineering, Master of Science and Doctor of Philosophy. The Master of Agricultural Engineering program places emphasis on design and internship in engineering experience to prepare the graduate for practice in the engineering profession.

Facilities for design and research are available in processing of agricultural products, plant and animal environment, energy in agriculture, microelectronics, light structures, agricultural power and machinery, pesticide application, soil and water resources development, irrigation, hydraulics, and hydrology.

Research projects are supported by the Agricultural Experiment Station. A well-trained faculty, many of them registered professional engineers with research, consulting and design experience, guide the graduate students' activities and help plan programs to meet the students' needs. Graduate students prepare designs and specifications for special equipment and facilities needed to carry out their work. They are expected to demonstrate by thesis and supporting research or by designs the ability to organize a design problem or an experimental investigation, carry it to completion and report the results.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology.

Admission to the Master of Agricultural Engineering degree program is permitted for students who meet the prerequisites as stated in the "Master of Engineering" section. The departmental graduate committee will evaluate the applicant's credentials to determine equivalency and specify requirements to overcome deficiencies. A student must be accepted by an adviser in the Department prior to official admission to the graduate program.

Degree Requirements. A candidate for any of the degrees listed above follows an approved plan of study which must satisfy at least the minimum University requirements for that particular degree.

School of Architecture

Professor and Head Virgil R. Carter,
M.Arch., FAIA

The School, founded in 1909, offers undergraduate programs in the two areas of architecture and architectural engineering. The School's parallel program emphasis on architecture and architectural engineering involves the sharing of faculty, course work and facilities. This sharing, under one roof, is a major strength of the School and makes it one of the few such integrated programs in the United States. The School of Architecture is an element of the College of Engineering, Architecture and Technology. This organization facilitates access to state-of-the-art electives and to a wide variety of graduate course work.

The School is dedicated to providing the highest quality programs of higher education to students whose career goals are to enter the private practice of architecture and architectural engineering. This clear educational goal allows the School to focus its resources toward the specific needs of the vast majority of its students at a level of excellence not otherwise achievable.

Architecture

Architecture is the difficult and complex art and science of planning, designing and renovating settings for human life and habitation. It is a creative response to human needs. Architects design new buildings, renovate and adapt existing buildings, their interiors and their sites.

Education in architecture consists of campus-oriented classroom and studio courses, as well as off-campus studies. It is conducted in an intellectual climate which stimulates inquiry, introduces principles and values, and teaches the disciplines necessary to work in collaboration with others. The goal of the program is the education of future leaders within the architecture profession.

The design studio is the center of the School's educational program. It is the setting where students and faculty work most closely together, and where all specialized study and knowledge comes together and is synthesized in design. The record of OSU students' achievements in the design studios is evidenced by the success in national and international architectural design competitions. Over the last 40 years, the School has the second highest number of winners and finalists of any program in the United States in these prestigious competitions.

The program has long been known as one of the strongest professional programs in the United States. OSU graduates are consistently offered

employment opportunities in many of the best architectural offices in Oklahoma and throughout the United States. The program is fully accredited by the National Architectural Accreditation Board.

Architectural Engineering

Architectural engineering combines the creative aspects of architecture with the analytical rigors of engineering. It differs from architecture in that architectural engineering has as its focus the design of structural and environmental elements, systems and procedures for buildings, rather than the design of individual buildings.

Architectural engineering at OSU concentrates on the design of building structural systems to resist the various forces of nature, such as gravity, winds and earthquakes, as well as the forces of man. It involves the detailed study and use of materials such as steel, concrete and wood in applications as diverse as earth-sheltered structures, high-rise and long-span structures.

Architectural engineers practice in a wide variety of professional engineering settings such as consulting firms, architectural firms, industrial or commercial organizations and governmental agencies. The program's educational goal, as in architecture, is to provide the education necessary for leadership in the architectural engineering profession.

The demand for OSU graduates consistently exceeds the supply potential from the School. OSU graduates are sought by leading architectural and engineering firms both in Oklahoma and nationally.

Undergraduate Curriculum

The programs in architecture and architectural engineering are five years long and offer the professional degrees of Bachelor of Architecture and Bachelor of Architectural Engineering, which are required for professional licensure.

Undergraduate Admission. Students who satisfy the University admission requirements are eligible to enroll for the first two years of the program. Upon completion of these two years, the best qualified students are selected, upon application, by the School for admission to the upper division. Admission is based upon academic achievement and professional potential. Admission criteria are subject to annual review by the School and may be obtained directly from the School.

Transfer students are required to furnish transcripts and course descriptions for previous classroom courses, as well as examples of previous studio work. Evaluation and enrollment by the School is on a course-by-course basis for all transfer students.

Student Work. Projects submitted for regular class assignments may be retained by the School. All projects not retained will be available to the student.

Faculty and Facilities. In keeping with the professional orientation of the School, the faculty each have extensive experience as successful practicing architects and architectural engineers, as well as outstanding scholastic records. Faculty experience includes the design of virtually all building types and systems in the many varied climates of Europe and Asia, as well as North and South America.

The School of Architecture is housed in the Architecture Building, the original University Gymnasium and Armory, built in 1918. This structure

was extensively remodeled in 1976 and contains all studios, laboratories, galleries and offices of the School. Specialized facilities include the Cunningham Resource Center, containing all of the University's holdings on architecture and a fully-equipped Computer-assisted Design Laboratory. The faculty and students are especially proud of the Architecture Building, for it serves as an example of innovative architectural design and the adaptive reuse of an important building.

Student Body. With the curriculum based upon extensive and personalized student-faculty interaction, the student-faculty ratio in studio courses is set at approximately 15 to one. Annual student enrollment is approximately 300 students of whom 22/are women and 1Ware international students, thus providing a rich and diverse educational environment. A variety of student organizations and activities are available.

Graduate Programs

The School offers the opportunity for specialized study at the graduate level in architecture and architectural engineering. These programs lead to the post-professional degrees, Master of Architecture and Master of Architectural Engineering.

These graduate programs are designed for students already possessing their first professional or five-year degree. Each graduate program is normally one-year long and consists of a minimum of 32 credit hours.

Candidates with nonprofessional four-year undergraduate degrees may apply for admission to the professional degree program and, if admitted, complete the requirements for a Bachelor of Architecture degree. Application may then be made to the School's graduate program.

Graduate Admissions. Admission is limited and based upon undergraduate academic records and accomplishments, examples of work, practical experience and recommendations from practicing architects, engineers and educators.

Admission depends upon being accepted by the Graduate College of the University and by the School's Graduate Admissions Committee. Complete applications for admission must be filed with

both the Graduate College and the School by February 15. The School's Graduate Admissions Committee will review all applications by March 31. Late applications will be considered only if vacancies exist. Normally, applications to the graduate program are considered for admission beginning the following fall semester only.

Student Portfolios. For the Master of Architecture program, photographic examples of work performed in architectural design and other professional courses or actual practice are to be submitted with the admissions application for review by the School. Slides are not acceptable. Portfolios should be mailed directly to the School to arrive no later than February 15. Candidates for admission to the Master of Architectural Engineering program are not required to submit a portfolio.

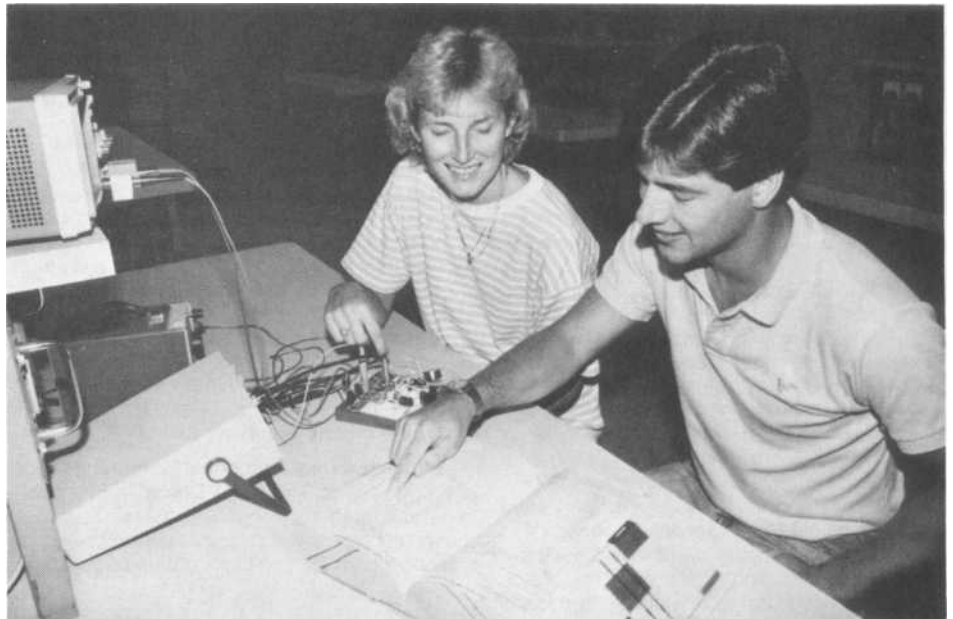
Regulations and Procedures. Regulations and procedures as established by the Graduate College for a master's degree apply to the School's graduate programs, except as otherwise noted in the School's current program description. This description is reviewed by the School annually, and may be obtained directly from the School.

For further information, contact the School of Architecture, Oklahoma State University, Stillwater, OK 74078-1085.

Chemical Engineering

Regents Professor and Head Robert L. Robinson, Jr., Ph.D.,P.E.

Chemical engineers apply chemical, physical, and engineering principles to solve important problems and to supply vital materials for our technology-based civilization. Their work ranges from pharmaceuticals to fuels to industrial chemicals to bioengineering and to many others. It includes energy conservation and pollution control. The emphasis on chemistry and the chemical nature of everything we use is what makes



chemical engineers different from other kinds of engineers.

Chemical engineers often find themselves defining a problem or product, developing a process to do what is needed, and then designing the plant to carry out the process. After the plant is started, chemical engineers will commonly manage operations, oversee equipment maintenance, and supervise control of product quality. They trouble-shoot the problems which hinder smooth operations, and they plan for future expansions or improvements. Their training and knowledge make them well qualified to market the products from a plant, the processing equipment for it, or even the complete plant itself.

The varied background and experience of chemical engineers make them ideally suited for advancement into top-level managerial and executive positions.

The academic preparation of chemical engineers for such a broad variety of careers must be based on a strong foundation in the basic sciences and mathematics. Computer competency is a must. Fundamental professional courses follow to provide the student an opportunity to apply the basic sciences to chemical engineering problems. Engineering design and laboratory courses integrate the more fundamental studies and demonstrate that engineering is a process of assembling knowledge from many fields and sources into a practical answer to a real problem. At the bachelor's level, three degree options are offered: (1) the regular course option prepares a graduate for a wide range of employment opportunities; (2) the petroleum option is specifically for those students interested in the energy field of petroleum and natural gas production, and (3) the premedical option is for those who wish preparation for medical school or seek employment in medically-related professions. All of these options prepare a student for success in M.S. or Ph.D. study at OSU or at other universities.

Upon completing the B.S. studies the qualified student is encouraged to continue in one of two master's programs.

Graduate Programs

The School of Chemical Engineering offers three programs leading to post-baccalaureate degrees: the Master of Chemical Engineering degree, the Master of Science degree, and the Doctor of Philosophy degree.

A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis or report; for the Master of Chemical Engineering candidate, the project will result in a report; for the Doctor of Philosophy candidate, the project will result in his or her dissertation.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree programs requires graduation from a chemical engineering curriculum approved by the American Institute of Chemical Engineers. Graduates from other curricula should submit transcripts to the head of the School of Chemical Engineering for evaluation.

Admission to the Master of Chemical Engineering degree program is permitted for students who have the minimum competencies as stated under "The Master of Engineering." Students may enter the program at any level for which they are qualified provided they are accepted by the School of Chemical Engineering.

The Master of Chemical Engineering Degree.

This program involves one year study beyond the B.S. degree course work. A minimum of 32 semester credit hours are required to incorporate CHENG 5213, 5423, 5633, 5743, 5793, 5843, and six additional hours of approved graduate-level elective courses. Also, a professional internship is required which is represented by enrollment in CHENG 5030 for at least six semester credit hours. Two semester credit hours of CHENG 5990, Special Problems, are required.

This program is distinguished by the incorporation of an intern experience to give students real-time engineering practice, usually in an industrial environment under the guidance of an industrial preceptor as well as a University professor.

The Master of Science Degree. General requirements for the Master of Science degree in Chemical Engineering are 30 semester credit hours beyond the B.S. degree of course work and an acceptable thesis (a minimum of six hours of credit required for thesis research). The chemical engineering courses taken must include CHENG 5213, 5423, 5633, 5843, and 5743.

The Doctor of Philosophy Degree. The general credit requirement is a minimum of 90 semester credit hours beyond the B.S. degree including at least 30 hours of credit for research. The student must select a minor field with at least 12 hours of credit in this area. The chemical engineering courses must include CHENG 6023 or 6113, at least one other 6000-level CHENG course, and 12 hours of credit in other 5000- and 6000-level CHENG courses. Each student is responsible for consultation with his or her advisory committee in preparing the study plan.

Civil Engineering

**Professor and Head Robert K. Hughes,
Ph.D., P.E.**

The exceptional diversity of professional practice in civil engineering presents many career opportunities for students well-founded in the physical sciences, mathematics, geology and biology.

The concern of civil engineers is man's environment-its control, alteration and utilization. Civil engineers engage in planning, designing and constructing highways, waterway and railway systems, harbors and shipping facilities, systems for the treatment and distribution of water and for the collection and treatment of sewage and industrial waste, dams and hydroelectric works, airports and terminals, structures of every kind including buildings, bridges, towers, industrial plants, aircraft, missiles, space vehicles, surface vehicles and submarines, tunnels and subway systems, schemes for the control of water and air pollution, and many other works of general benefit to society.

The professional curriculum in civil engineering is based on the pre-engineering courses in mathematics, physical sciences and engineering sciences. On this foundation, required courses train the student in the basic skills needed for the professional practice of civil engineering and provide the tools for more advanced study. Engineering theory and principles are developed in a way that will encourage their application to the solution of practical problems. Elective courses give experience in the solution of typical problems and develop the judgement and confidence of the student engineer.

The purpose of the curriculum is to prepare the student for his or her professional career as a designer, office engineer, field engineer, contractor, engineering businessman or manager. The graduate of this program will be well-prepared for work in engineering offices, city, state and federal governments and organizations, and the construction, chemical, petroleum and transportation industries.

Some degree of specialization is provided through the choice of elective courses in structures, engineering mechanics, transportation engineering, soil mechanics and foundations, construction engineering and management, environmental engineering and water resources. Strong support for various parts of the program are given by the departments of Industrial Engineering and Management, Mechanical and Aerospace Engineering, Agronomy, Business Administration, Chemistry, Geology, and Microbiology.

Graduate Programs

The School of Civil Engineering offers five programs leading to post-baccalaureate degrees: the Master of Civil Engineering degree, the Master of Environmental Engineering degree, the Master of Science degree in civil engineering, the Master of Science degree in environmental engineering, and the Doctor of Philosophy degree. The Master of Civil and Environmental Engineering degrees are graduate professional degrees with increased emphasis on professional practice through a broad spectrum of management, economic and technical studies and the incorporation of actual engineering design experience before graduation. The Master of Science degree, on the other hand, is characterized by a higher degree of technical specialization in a particular area of study. The Doctor of Philosophy degree is designed to prepare a student for research and for the teaching profession in engineering.

Major areas of study in the School are applied mechanics, structural analysis and design, transportation, construction engineering and management, geotechnical engineering, water resources, and environmental engineering. Research in all major fields is continuously pursued. Master of Civil Engineering candidates may choose either to specialize or to engage in a broadly based program of study, in accordance with an approved and purposeful plan of study.

Admission Requirements. Candidates for the Master of Science or Doctor of Philosophy degree must have graduated from a civil engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Graduates from other curricula and schools should submit transcripts to the head of the School of Civil Engineering for evaluation. Admission to the Master of Environmental Engineering degree program is permitted for students who meet the minimum prerequisites as established by the School of Civil Engineering.

Degree Requirements. All degree programs follow an approved plan of study that must be submitted at a designated time. All programs are characterized by the flexibility available in a study plan that is designed to satisfy the particular needs of the student, while conforming to the general requirements implied by the title of the degree and specified by the University.

The Master of Civil Engineering or Environmental Engineering degree requires the completion of at least 100 semester credit hours of work beyond the minimum criteria stated for admission to the

Professional School. This may include six semester credit hours for professional practice. Experienced engineers may substitute additional course work for professional practice.

The Master of Science degree in either Civil or Environmental Engineering requires the completion of at least 30 semester credit hours beyond the bachelor's degree, including a research thesis for which not more than six semester credit hours may be granted. The non-thesis option (32 semester credit hours) described in the "Graduate College" section may be permitted at the discretion of the student's adviser.

The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of course work beyond the bachelor's degree, including not more than 30 semester credit hours for the research thesis. In addition, the candidate must complete six semester credit hours of course work in an area such as languages, mathematics, statistics, experimental techniques, research methodology, or similitude, (as specified by the advisory committee) that will facilitate his or her research effort. Generally, official admission as a candidate for the Doctor of Philosophy degree in any program offered by the School will not be granted until a member of the Graduate Faculty in the School agrees to serve as major (or thesis) adviser for the prospective candidate.

Electrical and Computer Engineering

Professor and Head James Baker, Ph.D., P.E.

Electrical Engineering

The electrical engineering program provides the fundamentals for a career in many related areas. All around is seen the astounding impact of microelectronics on consumer products such as calculators, electronic watches, TV games,

home computers and microwave ovens, but the future impact will be even more astounding on worldwide satellite communications, energy conservation, automation of industrial plants, oil and gas exploration, electrical power generation and distribution, to mention a few.

The undergraduate electrical and computer engineering program at Oklahoma State University prepares each graduate for a life-long professional career. During the first two years, students complete a carefully designed pre-engineering program consisting of mathematics, physical sciences, engineering sciences and selected courses in the humanities and social sciences. During the final two years of the program, each student concentrates his or her study on electrical and computer engineering subjects and can elect from the following areas: computer engineering, electronics, energy systems, communications, control systems, electromagnetics, solid state devices and network theory/signal processing.

Computer Engineering

A special program option in computer engineering is offered by the School of Electrical and Computer Engineering. This option is designed for students who have a strong interest in computers and desire to gain a full understanding of both the electronic hardware and the programming software aspects of modern computer systems. A student in computer engineering will also gain a detailed knowledge of one or more applications where computers are being used as integral components of advanced engineering systems; examples are instrumentation and test facilities, communication systems, power systems and process control systems. Students in computer engineering will work directly with microprocessors, microcomputers, and minicomputers and develop special electronic circuits for interfacing these computers to various peripheral devices.

In addition to the laboratories devoted to research, separate instructional laboratories give students "hands-on" experience in microcomputers, minicomputers, digital logic design, elec-

tronics, electrical machinery, networks, instrumentation and electromagnetics. In most instances, the student is guided through laboratory exercises which are closely related to classroom lectures. Here the student has the opportunity to verify theoretical principles and design concepts presented in the lectures. In other courses, the laboratory formats are more open-ended, allowing the student to experiment freely and exercise individual discretion in discovering experimental results.

The School of Electrical and Computer Engineering offers a full range of undergraduate and graduate program options. A degree in electrical or computer engineering is also an excellent foundation for graduate work in other professional fields such as medicine and law. Many graduates also pursue advanced programs in business and management after earning a degree in engineering.

Graduate Programs

The School of Electrical and Computer Engineering offers three graduate degrees: Master of Electrical Engineering, Master of Science and Doctor of Philosophy. The Master of Electrical Engineering degree is designed to prepare the graduate for the practice of the engineering profession and is distinguished by the incorporation of an internship program to give students practical engineering design experience before graduation.

The Master of Science degree is designed for students interested in careers in industry and government service that emphasize advanced design, development, and research methods for high technology. This degree incorporates additional advanced course work and on-campus creative activities.

The Doctor of Philosophy degree is designed to prepare the student for high-level research/development positions in industry and government and for the teaching profession in engineering and is distinguished by the emphasis on research and by the incorporation of a doctoral thesis.

Students may select course work and participate in research and design projects in the following areas: computer engineering, energy systems, control theory, communications, electromagnetics, electronics, network theory, solid-state devices, artificial intelligence and parallel processing.

In addition, students may elect a multidisciplinary program that crosses departmental lines and emphasizes the application of electrical engineering and systems theory to complex problems involving the interaction of engineering systems and technology with social, economic and environmental processes.

Admission Requirements. Admission to the Graduate College, as described under "General Regulations" in the "Graduate College" section is the first step for those students proceeding toward advanced degrees. Graduation from an electrical engineering curriculum accredited by the Accreditation Board for Engineering and Technology with high scholastic performance qualifies the student for admission to the School of Electrical and Computer Engineering as a candidate for any of the three advanced degrees offered.

Graduates from non-engineering fields such as mathematics, physics and computer science are also admitted to Electrical Engineering M.S. and Ph.D. graduate programs if an evaluation of their transcripts indicates they are prepared to take graduate-level course work in electrical engineer-



ing, or can be expected to do so after a reasonable amount of remedial course work. This condition also applies to graduates of unaccredited engineering programs and engineering technology programs.

Admission to the Master of Electrical Engineering program is permitted for students who meet the minimum prerequisites as stated in the section "Master of Engineering." Students may enter the program at any level for which they are qualified; they must at least meet the minimum admission criteria and be accepted by the School of Electrical and Computer Engineering.

Degree Requirements. The Master of Electrical Engineering degree is awarded to those who complete 32 hours of credit meeting Graduate College requirements for a Plan III master's degree program. The plan of study for this program must include at least 24 hours of course work, with more than half in electrical engineering at the 5000 level or above, and six to eight hours of credit for the internship practice. Flexibility is permitted in selecting courses to achieve specific program objectives.

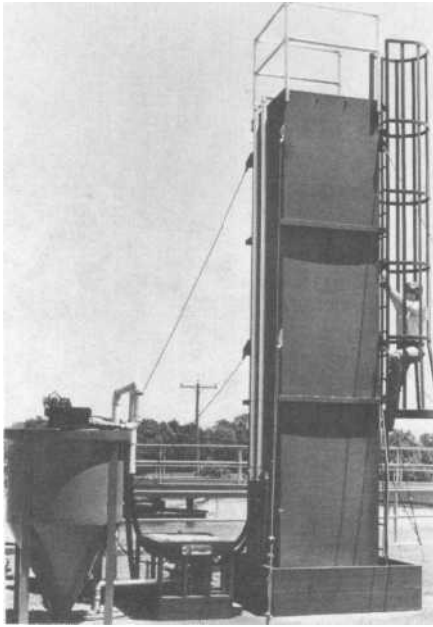
The Master of Science degree is awarded to those students who successfully complete an approved plan of study under one of two possible options. If a thesis is written, 30 semester credit hours are required, including six hours credit for the thesis. If no thesis is written, 32 semester credit hours are required, including two hours credit for a creative activity. To be approved, a plan of study will include, as a minimum, 18 hours of 5000-level courses in electrical and computer engineering. Most plans of study include additional 5000-level courses, depending upon the background and particular educational goals of the student, and the minimum stated above is allowed only when a specific interdisciplinary plan of study is approved by the faculty. Each student is encouraged to include courses in supporting disciplines such as mathematics, computer science, statistics, business or other engineering fields. In certain cases, remedial work in undergraduate electrical and computer engineering will be required in addition to the 30-32 hours specified above.

The Doctor of Philosophy degree is granted in recognition of high achievement in scholarship in course work selected from the broad field of electrical engineering, and an independent investigation of a research problem in a chosen field of specialization that leads to a contribution to knowledge, as presented in a dissertation. For this degree the Graduate College requires a minimum of 90 credit hours for acceptable academic work beyond the bachelor's degree, including credit for the dissertation.

General Engineering

Professor and Head Bennett L. Basore,
Sc.D., P.E.

For the student with interests that do not conform to any one of the traditional engineering disciplines, OSU offers a structured interdisciplinary program that continues the breadth developed in all engineering students in the engineering sciences course work, and has considerable depth.



General engineering embodies the fundamentals of four major engineering disciplines (civil, electrical, industrial and mechanical), to develop in basic science and engineering fundamentals regardless of the context in which these concepts are applied.

As a professional with an interdisciplinary background, the general engineer is prepared to analyze, design and synthesize solutions in a technically expedient manner, while considering the economics of design or process, as well as the humanistic requirements for utilization and operation. The student may choose to follow a professional practice within one of the four disciplines; he or she may look to a career in research and development, particularly of an interdisciplinary nature; he or she may choose the avenues of development in professional consultation or individual proprietorship; or finally, because of his or her background and perspective, he or she may choose a career in the management circles of government or industry.

The resources of the College, both faculty and laboratory facilities, are available to the general engineering student who pursues course work alongside majors in each of their traditional disciplines.

Because the general engineer can expect to be called upon to perform at a professional level in any or all of the disciplines covered by the curriculum, each student is encouraged to plan a program leading to a master's degree, which will assure a more competitive level of competence in all four of the engineering disciplines.

Graduate Programs

The School of General Engineering offers three programs leading to post baccalaureate degrees: the Master of General Engineering degree, the Master of Science degree in general engineering, and the Doctor of Philosophy degree. The Master of General Engineering degree is distinguished by its increased emphasis on professional practice and design through a broad spectrum of technical, management and economic studies and the incorporation of an internship program to provide actual engineering experience before graduation. The Master of Science degree is characterized by

a higher degree of technical specialization. The Doctor of Philosophy degree is a research-oriented degree designed to prepare the candidate for a career in teaching or research.

Major areas of study in general engineering follow the undergraduate pattern of combining course work from civil, electrical, industrial and mechanical engineering. Research is pursued with the option of limiting studies to one of the cooperating areas or of combining the areas.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation preferably from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Graduates from unaccredited engineering curricula or from curricula in chemistry, physics, and mathematics should submit transcripts to the head of the School of General Engineering for evaluation.

Admission to the Master of General Engineering degree program is permitted for students who meet the minimum prerequisites stated in "Master of Engineering." A student may enter the program at any level for which he or she is qualified provided the minimum admission criteria have been met and the student has been accepted by the head of the School of General Engineering.

Degree Requirements. An approved plan of study is developed for each student. All programs are characterized by the flexibility available in a study plan that is designed to satisfy the particular needs of the student, while conforming to the general requirements for the degree as specified by the University and as implied by the title of the degree.

The *Master of General Engineering* degree requires about three years of study beyond the pre-engineering requirements and involves not fewer than 98 semester credit hours of course work including an internship period. The plan of study for the graduate professional (third) year should include three semester credit hours of mathematics or statistics and probability; eight semester credit hours of internship/professional practice; 12 semester credit hours in an area of interest; and three semester credit hours of humanities. At least 32 semester credit hours must be included in the graduate professional study plan, and of these, 12 or more semester credit hours must be in design, as defined by the Accreditation Board for Engineering and Technology, and 21 semester credit hours shall be in 5000-level courses or above. Any remaining course work may consist of specified courses to meet the objectives of the student and the curriculum.

The *Master of Science* degree program is based on an integrated plan of study with a specific objective for each candidate. The Master of Science degree requires the completion of approximately 30 semester credit hours beyond the bachelor's degree including a research thesis of six semester credit hours. Students from disciplines other than general engineering will be required to follow study plans designed to produce the breadth expected of a general engineer, and will require 32 semester credit hours if no thesis is pursued.

The *Doctor of Philosophy* degree in general engineering requires the completion of not fewer than 90 semester credit hours beyond the bachelor's degree, including credit for a research dissertation. In the plan of study, the mathematics and technical engineering courses are directed



toward and support the proposed area of research. Emphasis may be placed on two or more areas of concentration which support the research and dissertation. The ideal plan of study should generally include: 12-18 credit hours of mathematics above the bachelor's degree or bachelor's certification, six credit hours of humanities, and 18-24 credit hours of research. The semester credit hours remaining to complete the plan of study should be selected to satisfy all requirements of the Graduate College, and to supplement the student's academic background. The overall plan of study is subject to the approval of the advisory committee.

Industrial Engineering and Management

Professor and Head Carl B. Estes, Ph.D., P.E.

Industrial engineering is one of the five major engineering disciplines and is concerned with designing, analyzing and operating a wide range of systems that include people, materials, money and equipment. Industrial engineering is the only engineering discipline which is specifically concerned with the role of the human being in the processes by which goods and services are produced and as such is often called the "people-oriented engineering discipline."

Productivity and effective utilization of resources, including energy and hazardous materials management, are principal concerns of practicing industrial engineers. The industrial engineer may follow a career in almost any type of enterprise; manufacturing companies, service organizations such as insurance companies, banks and hospitals, and government agencies, including city, state and federal government functions. The industrial engineer's position in an organization is usually as a management adviser in contact with every phase of the organization. Because of the breadth of his or her background, the industrial engineer is especially well qualified to rise to positions of leadership and authority within the organization.

The curriculum blends a basic group of common engineering science courses with specialized courses in the major areas of industrial engineering-design of human/machine systems, design of management control systems and improvement of operations (both manufacturing and service). The course offerings stress mathematical and statistical techniques of industrial systems analysis, quantitative methodologies of operations research, computers as a tool for problem solving and simulation, economic considerations of alternatives, control of product or service quality and quantity, specifications of the manufacturing process including equipment and tooling, planning, scheduling and control of work flow, and behavioral sciences in the organization and management of human endeavor.

Prospective students are encouraged to write directly to the School of Industrial Engineering and Management for career guidance information.

Graduate Programs

The School of Industrial Engineering and Management offers graduate programs leading to the Master of Industrial Engineering and Management degree, the Master of Science degree, and the Doctor of Philosophy degree. The School is also one of the joint sponsors of the Master of Manufacturing Systems Engineering degree.

The Master of Industrial Engineering and Management degree is a graduate professional degree with increased emphasis on professional practice, incorporating an engineering design experience during the final year of study.

The Master of Science degree is characterized by a higher degree of technical specialization in a particular field of study. This degree program is designed to prepare men and women for technical positions such as research and consulting, as well as professional practice, in various kinds of organizations.

The Master of Science degree and the Master of Industrial Engineering and Management degree are intended to be especially attractive to all engineering graduates, including non-industrial engineers, and to many science majors. The two degree programs include a strong, technical component and an orientation to business and management which is complementary to other technical backgrounds.

The Doctor of Philosophy degree is designed to carry the student to the leading edge of knowledge in the profession of industrial engineering and management. It is intended to prepare men and women for highly specialized positions, such as research and consulting in industry, government and service organizations, and for teaching and research positions in colleges and universities.

The Master of Manufacturing Systems Engineering degree emphasizes a broad exposure to manufacturing from the perspective of the industrial, electrical and mechanical engineering disciplines. Students select courses from all three engineering disciplines. The program is oriented toward engineering practice in integrated manufacturing systems. Structured as a terminal degree, it prepares individuals with knowledge of all aspects of manufacturing systems, including management as well as hardware aspects of manufacturing.

The basic consideration in graduate education in industrial engineering and management at this institution is the most effective and efficient utilization of human, physical, and economic resources. Instruction in management embraces both qualitative and quantitative concepts, including analytical methodologies and social considerations pertinent to organizations of many kinds.

Staff and facilities are available for the study and practice of several phases of industrial engineering. Advanced degree programs may be arranged with major emphasis in fields of interest such as industrial management, management systems analysis and design, operations research, production control, quality assurance, economic analysis, methods engineering, energy management and other qualitative and quantitative facets. Students may complement industrial engineering and management courses with work in several other branches of engineering, as well as economics, business administration, computer science, statistics, mathematics, psychology, and sociology.

Admission Requirements. Graduation from an accredited engineering curriculum with scholastic performance distinctly above average qualifies the student for admission to the Master of Science or Doctor of Philosophy degree programs. Applicants not meeting these criteria should submit transcripts to the head of the School of Industrial Engineering and Management for evaluation.

Admission to the Master of Industrial Engineering and Management degree program is permitted for students who meet the minimum prerequisites as stated in "Master of Engineering." A student may enter the program at a point for which he or she is qualified provided the minimum admissions criteria are met and the student is accepted by the School of Industrial Engineering and Management.

Degree Requirements. The Master of Industrial Engineering and Management degree requires the completion of approximately three years of study beyond the pre-engineering requirements, for a total of 157 semester credit hours, including the internship or professional practice.

The Master of Science degree in industrial engineering and management requires the completion of at least 30 semester credit hours beyond the bachelor's degree, including a research thesis of six semester credit hours. A 32 semester credit hour option is also permitted and must include three to five hours of independent study.

The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of

course work beyond the bachelor's degree or 60 semester credit hours of course work beyond the master's degree, including normally about 20 semester credit hours for a research thesis. In addition, the candidate must complete six semester credit hours of course work in an area such as mathematics, statistics, experimental techniques, or research methodology (as specified by the advisory committee).

The *Master of Manufacturing Systems Engineering* degree requires the completion of 33 semester credit hours beyond the bachelor's degree and normally includes six credit hours based upon an internship in industry.

Mechanical and Aerospace Engineering

Professor and Head Lawrence L. Hoberock, Ph.D., P.E.

Mechanical engineering is a professional discipline which involves the invention, design, and manufacture of devices, machines and systems that serve the ever-changing needs of modern society.

Mechanical engineering is an exceedingly diverse field which is not identified with or restricted to any particular vehicle, device or system. Mechanical engineers are vitally concerned with all forms of energy production, utilization and conservation. They deal with everything mechanical, whether it is small or large, simple or complex—from power lawn mowers to automobiles, fuel cells to nuclear power plants, gas turbine engines to interplanetary space vehicles, artificial limbs to life support systems, robotic manipulators to complex automatic packaging machines, precision instruments to construction machinery, household appliances to mass transit systems, and heating and air-conditioning systems to off-shore drilling platforms. In virtually every organization where engineers are employed, mechanical engineers are included.

The aerospace option within mechanical engineering is concerned with the science and technology of flight, and the design of air, land and sea vehicles for transportation and exploration. This exciting field has already led man to the moon and continues to lead in the expansion of man's frontiers deeper into space and into the ocean's depths. Because of their unique backgrounds in aerodynamics and lightweight structures, aerospace-oriented mechanical engineers are becoming increasingly involved in solving some of society's most pressing and complex problems—such as high-speed ground transportation and pollution of the environment.

The aerospace option in mechanical engineering is separately accredited as an aerospace group program by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Program criteria developed by the American Institute of Aeronautics and Astronautics as well as by the Society of Mechanical Engineers have been applied in the accreditation process.

The broad background and problem-solving ability of mechanical engineers make them suited to engage in one or more of the following activities: research, development, design, production,

operation, management, technical sales, patent law and private consulting. *Versatility* is their trademark. A bachelor's degree in mechanical engineering is also an excellent background for entering other professional schools such as medicine, dentistry, law or business (M.B.A.). A formal premedical option is available for students wishing to follow this avenue of approach to medical school. A petroleum engineering option is also available.

In the professional school, mechanical engineering students extend their study of the engineering sciences and consider applications of fundamental principles and analysis tools to the solution of real technological problems of society. Students make extensive use of modern electronic digital computers in virtually every course in their program. Design courses involve students in the solution of authentic, current and significant engineering problems provided by industrial firms, such as Ford, Fisher Controls, IBM, Whirlpool, Conoco, Phillips, Halliburton, Procter and Gamble, Mobil, Texas Instruments, Magnetic Peripherals, 3M, General Dynamics and Boeing. These industrial firms also are representative of those hundreds of firms that employ mechanical engineers with the aerospace option.

The student designs, with the guidance of an adviser, an individualized program of study consistent with his or her interests and career plans. Some students terminate their studies with a bachelor's degree, while others receive one of several graduate degrees.

Graduate Programs

The School of Mechanical and Aerospace Engineering offers programs leading to the Master of Mechanical Engineering degree, Master of Science degree, and the Doctor of Philosophy degree.

The Master of Science degree and the Doctor of Philosophy degree prepare the graduate for research/development positions in industry and government, or for the teaching profession in engineering. These degrees are distinguished by the incorporation of a research component.

The Master of Mechanical Engineering degree prepares the graduate for engineering practice and is distinguished by its incorporation of an off-campus internship in industry to give the student engineering design experience before graduation.

Students may select course work and participate in research or design projects in the following areas: fluid mechanics and aerodynamics, thermal and environmental sciences, engineering acoustics and vibrations, mechanisms and systems design, energy conversion and utilization, solid mechanics and materials behavior, system dynamics and automatic control, fluid control systems, and biomechanics. Students are encouraged to take courses in mathematics and science and in other fields of engineering which fit into their programs.

Admission Requirements. Admission to the Graduate College is required of all students pursuing the M.Mech.E., M.S., or Ph.D. degree. Graduation from a mechanical or aerospace engineering curriculum accredited by the Accreditation Board for Engineering and Technology, with scholastic performance distinctly above average, qualifies the student for admission to the School of Mechanical and Aerospace Engineering as a candidate for the M.S. and Ph.D. degrees. Graduates from disciplines other than mechanical or aerospace engineering may be admitted if an

evaluation of their transcripts by the School of Mechanical and Aerospace Engineering indicates they are prepared to take graduate-level course work in mechanical engineering, or can be expected to do so after a reasonable amount of prerequisite work.

Admission to the Master of Mechanical Engineering degree program is for students who meet the prerequisites stated under "Master of Engineering." A student may enter the program at any level for which the individual is qualified provided he or she meets the minimum admission criteria and is accepted by the School of Mechanical and Aerospace Engineering.

Degree Requirements. All degree programs follow an approved plan of study designed to satisfy the individual goals of the student, while conforming to the general requirements of the School of Mechanical and Aerospace Engineering and the Graduate College.

The Master of Mechanical Engineering degree requires 24 semester hours of approved graduate-level course work and a prescribed internship. As a result of the internship, a written report acceptable to the faculty must be submitted for completion of the degree requirement.

The Master of Science degree program with the thesis option requires 24 semester credit hours of approved graduate-level course work, and a suitable research thesis of six semester credit hours. The non-thesis option requires 32 semester credit hours of which two to five must be for an acceptable, individually directed creative activity which results in a written and oral report to the faculty.

The Doctor of Philosophy degree requires a minimum of 90 semester credit hours beyond the bachelor's degree, including a dissertation for which no more than 30 semester credit hours may be awarded.

Division of Engineering Technology

Professor and Director James E. Bose, Ph.D., P.E.

Engineering technology education is concerned with the practical application of engineering achievement with emphasis upon the end product rather than the conceptual process. Whereas the development of new methods is the mark of the engineer, effective use of established methods is the mark of the technologist. Often the technologist will be expected to achieve what the engineer conceives.

Engineering technology education is designed to educate two-year, associate degree *technicians* and four-year, bachelor's degree *technologists*, either to assist engineers or to provide independently the support for engineering activities. The bachelor's degree *technologist* receives a more intensive education than the *technician* in his or her technical specialty and great depth in mathematics and technical sciences. Further, the additional two years provide more breadth in related technical, communication and socio-humanistic studies. A "master of detail," he or she is capable of independent action in performance of technical activities and is frequently involved as a coordinator, expeditor or supervisor of other

technical personnel. His or her capability in technical sales and other public-contact positions is enhanced by his or her background in selected liberal studies.

The engineering technology graduate is qualified to select from a broad array of positions. In research and development, he or she may serve as a laboratory technician or engineering assistant in the performance of experiments, evaluation of data, or prototype development. In production, typical positions are engineering aide, process specialist, quality control technician, materials specialist, design technician, technical writer and production supervisor. In the field, he or she will often be identified as a technical representative, technical salesperson, field test technician or technical consultant.

The Bachelor of Science in Engineering Technology program is composed of the following curricular subdivisions:

Mathematics and science-algebra, trigonometry, applied calculus, general physics, and chemistry or other science.

Technical specialty-technical science and related technical courses.

Communication-English composition, and business or technical communication.

Social sciences and humanities-history, government, religion, literature, art, music, etc.

Electives-controlled and general.

High School Preparation and Counseling Information

At least two semesters of high school algebra and a course in plane geometry are recommended for entering students. One year of high school credit in physics and/or chemistry is desirable.

Those less intrigued with theoretical concepts but who have the interest and aptitude toward applications are likely engineering technology majors. These students particularly appreciate the engagement of technical specialty courses beginning with the first semester and continuing throughout the course of study. The relevance of the technical science and related technical courses adds further satisfaction.

Transfer Students

An important, contemporary educational development is the "two-plus-two" bachelor's program. Those completing an associate degree in technology-oriented curricula at other institutions are generally admissible to the junior year with a minimum loss of academic time. The "two-plus-two" concept provides the attractive feature of two occupational-entry levels-technician or technologist.

Curricula

Bachelor of Science Degree

Engineering Technology Programs
Construction Management
Electronics
Fire Protection and Safety
General
Manufacturing
Mechanical Design
Mechanical Power
Petroleum

The Bachelor of Science in Engineering Technology degree credit hour requirements vary from 126 to 129 credit hours.

Construction Management Technology

Associate Professor and Head Jerrold F. Bradley, M.S., P.E.

The construction industry is the largest industry in the world. Leadership in this field requires a broad knowledge of labor, materials, equipment, capital and construction procedures. The interdisciplinary approach of the construction management program offers the student specialized course work in all phases of construction, designed to prepare him or her for responsible positions in industry.

The modern constructor must have a great deal of technical knowledge to keep abreast with rapidly changing materials and methods of construction. Specialized courses in estimating, surveying, structures, construction planning and scheduling, construction law and insurance, field and office management and construction procedures provide students with the background necessary for today's construction industry. These specialized courses, in addition to a blend of the basic sciences, business, and general studies, produce a well-balanced curriculum for students in construction. Special attention is given to computer application in construction estimating.

Students with an interest in building structures may select courses in the "building" option of construction management which provides him or her with a knowledge in working drawings, mechanical and electrical equipment of buildings, and other course work for a career in building construction.

Students with an interest in civil engineering structures may select courses in the "heavy" option of construction management which provides him or her with a knowledge in highways, soils, foundations and other course work for a career in the heavy and industrial construction industry.

Graduates of construction management have shown the curriculum to be successful in their development as productive members of the construction industry, holding responsible positions as project managers, estimators, material and equipment salespersons, labor management and construction managers.

Electronics and Computer Technology

Professor and Acting Head Russell L. Heiserman, Ed.D., S.E.T.

The electronics technology curriculum provides preparation for outstanding career opportunities not only in the electronics industry itself but also in many other areas in modern industry which depend upon electronics for control, communications or computation. Many opportunities exist for graduates to work in the areas of digital electronics, microcomputers and main-frame computers.

The work of the electronics graduate may range from assisting in the design and development of new equipment in the laboratory or applying modern microprocessors in the field, to the operation or supervision of production operations, technical writing, customer service and sales.

The program provides the Bachelor of Science degree in Engineering Technology with an elec-

tronics major. To meet these diverse needs the program is laboratory-oriented and provides a strong foundation of mathematics and science, specialized course work in electronics technology and related technical areas, and courses in the area of communications and the social studies.

The electronics technology-computer option curriculum provides the preparation for graduates to enter the growing and exciting field of computer hardware and software. The demand for graduates having both computer hardware and software skills is quickly developing as the importance of automation, robotics, and artificial intelligence is recognized. Graduates of this program will be prepared for those opportunities in industry requiring considerable knowledge of both computer hardware and software.

The program provides the Bachelor of Science degrees in Engineering Technology with an electronics major-computer option. To meet the diverse needs that graduates will have, the program provides a strong foundation of mathematics, science, specialized courses in the computer field. Related courses in the humanities and social sciences are included to give the graduate an appreciation of the world in which the graduate will live and work.

Graduates will have the opportunity to work for many different kinds of industrial concerns. Computer manufacturers, as well as companies that are incorporating computers into their product will be interested in employing the graduates. Others may choose to seek employment in computer sales or software development.

Fire Protection and Safety Technology

Associate Professor and Head Harold R. Mace, M.S.

The nuclear/electronic/aerospace revolution, in conjunction with increased ecological awareness, has created an economic and moral responsibility to provide a cadre of trained personnel, knowledgeable in current loss-control and risk management techniques. In response to this challenge, the curriculum is designed to familiarize the student with inherent risks in such areas as fire protection, occupational safety and health, radiation hazards, product liability and industrial security. Courses and laboratories are structured to enable the recognition, evaluation and control of existing and potential hazards threatening losses to life, property or proprietary information.

The curriculum emphasizes industrial fire prevention, occupational health and safety, risk assessment and industrial hygiene.

General Technology

Professor and Head James E. Bose, Ph.D., P.E.

The general technology curriculum is designed to provide a bachelor's degree program that will prepare men and women for employment as engineering technologists in more than one specific area. Normally, there are two groups of students who enroll in this program: those who have an associate degree in one of the traditional technology specialties, but desire more diversification than continuing in the same specialty; and those who have an associate degree from another institution in a technical specialty not offered at Oklahoma State University.

Each student who completes the program must show proficiency in the following areas by completing appropriate courses: technical graphics, machine tool processes, hydraulics, computer programming, electronics, controls, dynamics, supervision and instrumentation.

Manufacturing Technology

Associate Professor and Head **Gerald R. McClain, M.S., CMFgT.**

The flow of affordable goods and products from producer to consumer is a major cornerstone of the free enterprise system that is enjoyed in the United States. Essential to this system are the manufacturing industries which comprise that segment of our economic society directly responsible for the conversion of raw materials into usable products. Today these industries face numerous and complex challenges, which if met, offer promising careers to men and women who have interests in manufacturing. These career positions include such areas as tool design, cost evaluation and control, plant operations, product design and development, and manufacturing methods. Emerging career fields include robotics, computer-integrated manufacturing and automatic assembly.

The manufacturing technology option provides educational experiences in the core areas of manufacturing processes, industrial materials, graphic communication and technical science, as well as an opportunity to develop an area of specialization. This option is available only for the bachelor's degree (an associate degree is not available). Manufacturing courses are concentrated in the last two years allowing for efficient transfer from other OSU programs or from other colleges or universities.

Mechanical Design Technology

Associate Professor and Head **Gerald R. McClain, M.S., CMFgT.**

Mechanical design is an activity necessary for existence of the modern world. All the conveniences of today's world have passed through the designers on their way to being useful products. Mechanical design is applied in robotics, automotive manufacturing, computer-aided drafting and design, computer-aided manufacturing, agricultural machines, petroleum industry, mining, shipbuilding, spacecrafts, electronics manufacturing, food processing, aircraft, metals and plastics production-nearly the entire spectrum of industry. Every industry requires some type of mechanical design, either directly to produce the product or indirectly to produce the tools, equipment and materials used to manufacture the product.



The computer has had an impact on few areas of technology more than mechanical design. The phrase "computer-aided design" or "CAD" means many things from computer drafting or graphics to sophisticated solids modeling and analysis. The mechanical design student is exposed to a range of applications from designing with a computer to manufacturing with a computer. It is the objective of the department that all of its graduates be proficient in using the computer as a problem solving tool both graphically and analytically.

Transfer students with an associate degree in drafting and design may transfer into the program with ease. The junior and senior years provide additional education in design principles, manufacturing processes, computer graphics, and other related areas necessary for more complex aspects of mechanical design. The mechanical design technologist with in-depth analysis and technical knowledge makes a computer-aided drafting and design work station a design tool rather than just a drafting tool. Bachelor of science graduates usually find employment in areas related to new product design and redesign, or manufacturing equipment design.

The curriculum has been carefully constructed to provide a realistic progression from the basic, or elementary principles, to advanced or more sophisticated techniques. The curriculum has two emphases available. The graphics emphasis requires the courses that would best prepare a graduate to work as a mechanical designer, tool designer, or product designer. The broad emphasis requires greater breadth and allows more flexibility to prepare for the broader fields of mechanical technology, such as, test, evaluation, operation, liaison or sales. Companies utilizing the talents of designers are diversified in their products, as well as geographical location, thus

providing a variety of choices in respect to both type of work and place of residence. In addition to ABET accreditation, this technology program is certified at the Engineering Designer level by the American Institute for Design and Drafting (AIDD).

Mechanical Power Technology

Professor and Head **Marvin D. Smith, Ph.D., P.E.**

The mechanical power program in Engineering Technology prepares the graduate for entry into a broad spectrum of the industrial world. It is concerned with the utilization of energy, development and transfer of power, and the measurement and control of fluid and mechanical devices.

This program is designed to introduce the student to the broad spectrum of mechanical devices and skills. It also produces a highly competent technical individual who is capable of immediate employment in diverse industrial, governmental and education institutions. It offers a depth of theoretical knowledge, as well as a breadth in equipment exposure.

A graduate of this program will be thoroughly familiar with the scientific principles and the equipment associated with the generation, transmission and utilization of mechanical power.

Petroleum Technology

Professor and Head **Marvin D. Smith, Ph.D., P.E.**

The petroleum program in Engineering Technology is primarily concerned with the application of equations and techniques toward effectively drilling for, producing, and processing petroleum fluids. Graduates become involved in predicting recoverable reserves, designing drilling programs, casing designs, selecting completion techniques, designing artificial life systems, and designing lease processing systems and pipelines. They also become involved in well testing, well evaluation, problem well analysis and well treatment.

This program is designed to provide the graduate with both the theoretical and practical knowledge required for employment and advancement in the diverse petroleum industry and related energy industries. Emphasis is placed on the application of equations rather than the derivation of them. Another important aspect is the practical operations and associated equipment required to accomplish the events listed above.

The graduates of this curriculum are prepared in communication skills, computer usage, problem solving techniques and organization. They are capable of independent technical activities and of assuming responsibility for projects.