

2001-03 Undergraduate Catalog

College of Technology

College of Technology
102 Technology, 372-7581
www.bgsu.edu/colleges/technology

College administration

Office of the Dean

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204 Technology, 372-2438

Office of Associate Dean

Donna K. Trautman, Ph.D., 207 Technology,
372-7613

Office of Student Program Services

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program services and assistant to the
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Office of Cooperative Education

Barry D. Piersol, M.Ed., director of coopera-
tive education and assistant to the dean,
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Office of Graduate Studies

Donna K. Trautman, Ph.D., director, 207
Technology, 372-7613

Departments

Technology Systems, Wil Roudebush, Ph.D.,
interim chair, 264 Technology, 372-2439
Visual Communication and Technology
Education, Larry O. Hatch, Ph.D., chair,
260 Technology, 372-2437

Academic objectives

Mission

The goal of the College of Technology is to provide graduates with appropriate technological competencies and a quality general education. This is accomplished through coursework in business, a background in arts and sciences and the acquisition of effective communication skills, in addition to a strong technical core.

Since its beginning, the College of Technology has provided students with the competence to be adaptable and flexible—successful traits for future careers. These students are secure with a core of broad knowledge of technology and able to translate that education in a rapidly changing profession. In today's age of high technology and specialization, College of Technology graduates serve as technical managers, teachers, researchers and practitioners in business, industry, government and education.

The mission of the College of Technology is to engage our diverse college community in the study of technology to cultivate and expand human potential. To that end, the college fosters a technologically and culturally global perspective. Through collaborative efforts, we develop professionals and leaders who are adept in technology, innovative in problem solving and skillful in the communication of concepts and ideas.

The major goals for the implementation of this mission include:

1. To prepare exemplary technological problem solvers through academic and field-based experiences for professional leadership roles;
2. To provide and support an environment conducive to research and development and dissemination of technological knowledge and innovation;
3. To provide professional development and service opportunities to meet the extended range of technological needs;
4. To proactively influence technology policy and economic development consistent with our mission.

Accreditation

All technology specializations in the College of Technology are fully accredited by the National Association of Industrial Technology. Students have the opportunity to become involved in the National Association of Industrial Technology as student members.

The technology education program is accredited by the National Council for the Accreditation of Teacher Education.

The construction management and technology program is accredited by the American Council of Construction Education.

Degree programs offered

Bachelor of Science in Technology
Advanced technological education
Architecture/environmental design studies
Aviation studies
Construction management and
technology
Electronics and computer technology
Manufacturing technology
Mechanical design technology
Technology education
Visual communication technology

College Admission

Students admitted to Bowling Green State University may register as majors in the College of Technology when they have:

1. Formally declared their intent to major in the college;
2. Registered with the college's student program services office as a provisional member of a program or an undecided major;
3. Conferred with an adviser assigned by the College of Technology.

Guidelines for transfer students

Students transferring from within BGSU

Students transferring from another college on the main campus, the Firelands campus or pre-major advising should initiate the transfer process by speaking with an adviser in their home college. After completing a College Transfer Form, the student should make an appointment with the director of student program services (372-7581).

Students transferring from another institution

Students who have earned an associate degree in an engineering or related technology from a regionally accredited post-secondary institution have some advantages in completing their baccalaureate degree in technology. Consistent with University policy, all credits earned at such institutions will count as credits toward graduation. Upon admission, a student's coursework will be evaluated and those courses appropriate for the major will be used to satisfy specific degree requirements. Additionally, because of the background accumulated at the two-year institution, some introductory courses may be waived even if the student has not taken courses directly equivalent to those required at the University.

Students with associate degrees must complete only two of the three required semester-long cooperative education experiences. Additionally, if a student has been employed, full-time, in a related field for at least one year he or she may receive credit for an additional co-op through the credit-by-exam process.

For ease in transferring into BGSU, transfer guides have been developed for many of the institutions in the area. These guides provide information about specific

courses available at the community college that may be used to meet degree requirements within the College of Technology. These guides are available from the student program services office.

Academic advisement

The College of Technology faculty and administration are committed to providing a strong program of quality academic advising for all of its students. The mission of academic advising is to serve as an ongoing process to assist students. Faculty advisers are readily available. However, students should make appointments in a timely manner and prepare for their conferences with such items as tentative class schedules and questions, as appropriate, to the purpose of the meeting.

The student program services office is located in 102 Technology. The professional staff is available to assist students with specific requirements, curriculum developments, career options, academic appeals procedures and general advisement.

After selecting a major within the college, the student is assigned to an adviser in the major area of study. Teaching and advising schedules change every semester. At the beginning of each semester, faculty advisers post their advisement schedules. The responsibility of contacting an adviser rests with the student. The student program services office supplements advising performed at the department level.

Program revision, assistance with registration, matriculation and shifts in the demands of the marketplace require a close adviser/student relationship. Both students and the college share a responsibility to offer/secure the best advisement possible.

Students are responsible for:

- Attending Orientation/Registration or an individual meeting with an adviser prior to their first term of enrollment;
- Seeking advisement from both the Office of Student Program Services and their faculty adviser on a regular basis;
- Maintaining their own academic records including the catalog of their term of admittance, transcripts, degree audits, evaluation of transfer work and notes of previous advising visits.

The college is responsible for:

- Providing students with accurate information;
- Providing academic orientation programs for new students each term;
- Making brochures, handbooks and checklists of major requirements to help acquaint the student with departmental requirements and opportunities available.

Student awards and organizations

Honors

The college is the international headquarters for Epsilon Pi Tau, the international honorary for technology. Its Alpha Gamma chapter

serves students and other professionals who may be invited to membership on the basis of scholarship and leadership performance. The purpose of Epsilon Pi Tau is to recognize high academic achievement. Students in construction management may also be tapped for participation in Sigma Lambda Chi Construction National Honor Society.

Scholarships

Each year College of Technology students are awarded University, college and program awards. Applications for college and program awards may be obtained from the student program services office. Incoming freshmen and transfer students may be offered scholarships, without application, based on prior academic performance.

Student organizations

Special opportunities exist for students to become involved in a number of professional organizations. The following student chapters or their counterpart national or international organizations are operated by students who major in the college: Alpha Eta Rho (Aviation Studies Organization), American Institute of Architecture Students, Bowling Green Technology Education Association, Instrument Society of America, Society of Manufacturing Engineers and Student Construction Management Association. Students may also choose to participate in the Visual Communication Technology Organization, Mechanical Design Association, the Flight Team or the Electric Falcon Race and Design Team.

College requirements and regulations

General education requirements

All College of Technology programs are in compliance with the University general education guidelines, as stated on p. 5 in this catalog. Furthermore, general education components are integral parts of each College of Technology program as listed on the following pages. Specifically, many of the majors require courses which may be used to satisfy both the major requirement and general education (e.g., PHYS 201 for many majors).

Course requirements

All courses offered in the College of Technology, except for co-ops and a few specified courses, must be taken for letter grades by majors in the College of Technology. Additionally, all courses required for matriculation, indicated in bold print on the program checksheet, must be completed with a grade of "C" or higher.

Cooperative education

The Cooperative Education Program of the College of Technology is a required program which integrates classroom academic work

with practical work experience. Students alternate periods of attendance at college with periods of employment in industry, business or government. College of Technology majors are required to participate in three semester-long, paid, full-time co-op work assignments which alternate with semesters spent on campus. As part of the cooperative education requirement, students must enroll in and attend classes as full-time students at the University's main campus during the semester immediately before commencement.

The Cooperative Education Program requires each student's employment to be directly related to his or her academic program. The program also requires that all work experiences increase in difficulty and responsibility as students progress through their college curriculum.

Based upon institutional policy, students enrolled in (co-op) TECH 289/389/489 are involved in a full-time academic experience at BGSU.

Program matriculation

Full membership in a College of Technology program with the exception of technology education will become effective when a student has:

1. Attained an overall BGSU grade point average of at least 2.25 for all courses taken prior to applying for matriculation and a 2.5 in technology courses;
2. Completed a cooperative education experience (TECH 289);
3. Completed with a grade of "C" or better, all courses required for matriculation as specified on program checksheets;
4. Completed any additional specific requirements and application procedures that have been established by the program in which the student wishes to matriculate. Information on specific program matriculation requirements is available in the college's student program services office.

The matriculation steps listed above must be completed before students will be permitted to register for 300- and 400-level courses in the College of Technology.

Catalog year

Students are bound by the curricular requirements in place at the time they enter the college. These requirements may be found in the undergraduate catalog in effect at that time. A student has the option of moving to a more recent catalog year, but may not move to an earlier one. If a student is not enrolled for a period of twelve months, upon return he or she will be bound by the requirements then in effect. In accordance with University articulation agreements, a student transferring from many institutions within the state has the right to be bound by the curricular requirements in place when he or she first entered the state system.

Academic appeals

The College of Technology has established specific requirements for admission, program matriculation, graduation and cooperative education. Information pertaining to these requirements is available from the student program services office. Questions regarding these requirements, standards or appeals procedures may be directed to this office.

Petitions for an exception to an academic policy or rule may be initiated in the student program services office. A rationale for the appeal is required and documentation or other evidence should be attached. The written materials constituting the appeal are then reviewed by an appeals board which serves in an advisory capacity to the dean. Examples of academic appeals include: appeals for reinstatement after being suspended or dismissed for academic reasons, appeals regarding the denial of admission to either the college or a program and appeals to drop and/or change classes to or from "S/U" beyond the specified deadline. The dean of the college reserves the right to final decision.

Appeals regarding the issuance of a grade are processed through the specific instructor(s) of the course(s). Grade appeals are not processed through the college's student program services office, but must be processed through appropriate departments. In cases related to academic honesty or other disciplinary action, students are referred to the Student Affairs Handbook.

Graduation requirements

Bachelor of Science in Technology

Bachelor of science in technology programs are designed for the student interested in the application of arts and sciences to the technologies of industry. Career opportunities exist in a growing area of service. Emphasis is placed on industrial control and supervision, technical processes and personnel leadership with such employment classifications as: construction supervision, production management, technical sales, product design, quality assurance, technical service training, graphic coordinator, cost and systems analysis, and customer service technician. These classifications are used in all segments of our enterprise system including the automotive, construction, pollution control, communications, glass, plastics and metal industries. The University's geographic location is such that excellent cooperation exists with companies and government agencies which require well-prepared individuals in technology.

Applying for the degree

The College of Technology observes the University's requirements for graduation application (see p. 5). Applications for graduation may be obtained from student program services.

Advanced Technological Education

260 Technology, 372-9548 or (800) 328-0901
www.bgsu.edu/colleges/technology/ate

The advanced technological education major is designed for people currently employed in technical or community colleges, business or industry who wish to continue their education and/or prepare for advancement. The program combines general education requirements with a well-rounded curriculum that includes the student's unique technical concentration developed as part of an associates' degree, with the courses required for the major.

The emphasis is on providing the education to move into training and management positions in business and industry, or instructor positions in community college settings. The distance learning program utilizes videoconferencing technology that provides an interactive, two-way audio and video classroom at two or more sites. Through classes currently offered at several locations in northwest Ohio, students can complete a bachelor of science in technology.

Major coursework includes: Adult Learning in Technology Settings, Technology Systems in Society, Instructional Design & Delivery, Developing Training Programs, Administering Training Systems, Evaluation & Assessment in Technology Settings, Introduction & Application of New Technology, Computer Mediated Communication and Instructional Materials Development.

Admission to this program is limited to those with an earned applied or technical associate's degree and extensive work experience.

Learning Outcomes

Upon completion of the baccalaureate degree, students in advanced technological education are expected to:

- Demonstrate critical, professional and personal skills such as independent thinking, communication skills (oral, written and listening), ability to work effectively within groups and a commitment to continuous learning;
- Demonstrate strong problem solving, questioning and investigative, and creative thinking skills;
- Exhibit ethical values and behavior by articulating the impact of alternative decisions on other people (customers, shareholders, the public), business operations, educational institutions and the environment;
- Understand cultural, racial and gender differences in education, business and industry well enough to be able to address discriminatory practices;
- Communicate with and instruct others using state-of-the-art telecommunication technologies at multiple sites.

Architecture/Environmental Design Studies

260 Technology, 372-2437
www.bgsu.edu/colleges/technology/Arch

The architecture/environmental design studies major is a pre-professional degree program that prepares students for continued education in a professional degree program in architecture or a related field, or for employment opportunities in architecturally related occupations. The focus of the program is to enhance the student's problem-solving ability and produce critical thinkers, not technicians.

Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board (NAAB): the bachelor of architecture (B.Arch.), which requires a minimum of five years of study, and master of architecture (M.Arch.), which requires a minimum of three years of study following an unrelated bachelor's degree or two years following a related preprofessional degree. These professional degrees are structured to educate those who aspire to registration/licensure as architects.

An important component of this program is a cooperative education experience in a design or design-related position in industry which is supervised by College of Technology faculty or staff.

Learning Outcomes

Upon completion of the baccalaureate degree, students in architecture/environmental design studies are expected to:

- Analyze architectural and urban design problems and synthesize solutions at different levels of complexity, scope, and building types;
- Employ the oral, written and graphic modes of communication for expressing research work and design efforts at different stages of the design process;
- Apply the concepts of architectural history and theory in shaping buildings, cities and other spatial environments—encompassing international traditions as related to aesthetics, environment, society and human behavior;
- Understand the basic principles that inform the design of the structural, material and mechanical/electrical systems and to assess, select and integrate such systems into a comprehensive building design.

First year (34 hours)

ARCH 105 (3)
CONS 235 (3)
DESN 131 (3)
ENG 112 (3)
GEOL 104 (4) (meets natural science requirement)
MATH 126 (5)
MIS 200 (3)
VCT 203 (3)
General education core (3)
TECH 289 (4)

Second year (33 hours)

General education core (6)
 ARCH 205, 236, 250 (9)
 DESN 243 (3)
 ECON 200 (3) (meets social science requirement)
 PHYS 201 (5) (meets natural science requirement)
 VCT 282 (3)
 TECH 389 (4)

Third year (33 hours)

ARCH 301, 307, 336, 337, 401 (15)
 ARCH 440 (2)
 ARTH 440 (3)
 CONS 336 (3)
 Technical degree elective (3)
 ENG 388 (3)
 TECH 489 (4)

Fourth year (27 hours)

Business degree electives (6)
 General education core (3)
 ARCH 450 (3)
 ARCH 470 (2)
 ARCH 471 (4)
 TECH 302 (3)
 Technical degree electives (6)

♦Aviation Studies

264 Technology/204 Technology Annex,
 372-2439 or 372-2870
www.bgsu.edu/colleges/technology/Aerotech

The aviation studies major is designed to prepare students for responsible positions in general and commercial aviation. The program is organized around three specializations: aviation management and operations, aviation technical management and flight technology and operations. All instruction leading toward Federal Aviation Administration (FAA) flight certification is conducted in accordance with the appropriate Federal Aviation Regulations.

All students are also required to complete coursework in areas of science and mathematics, general education and business. Supervised cooperative education experiences with or related to the specializations selected are required.

Once a student has enrolled at Bowling Green State University, all subsequent flight and ground training must be completed in residence at the University. Flight and ground training obtained elsewhere is not permitted without prior written authorization from the dean of the College of Technology. If permission is granted to receive flight instruction elsewhere, no academic credit is accepted or awarded by the University. In this case, a student is required to take approved elective(s) to satisfy total credit hour requirements.

In degree programs requiring flight training, a transferring student may (at the discretion of the dean of the College of Technology) have the requirement waived for private pilot and/or ground instruction if all instruction was accomplished or the student graduated from an institution where a course of study was approved under Part 141 of the Federal Aviation Regulations. Students

receiving such a waiver are required to take additional courses to satisfy the credit hour requirement. To receive transfer credit in private pilot and/or ground instruction a student must have taken them at a regionally accredited college or university as part of a FAR Part 141 syllabus. All other flight and ground training courses must be completed as part of the BGSU aviation studies program. The dean of the college may make exceptions for certain qualified aviators.

Fees for the flight instruction courses are based on a minimum number of flight hours as determined by the FAA. Students may take longer to reach the level of flight proficiency required by the FAA. In this case, additional fees will be charged based on the actual number of flight hours a student has received. These rates are approved by the Board of Trustees. Flight fees are not refundable.

Learning Outcomes

Upon completion of the baccalaureate degree, students in aviation studies are expected to:

- Solve aviation related problems using knowledge, skills and aptitudes gained in the program to assure productive outcomes;
- Plan, organize, conduct and complete a safe and efficient flight in single engine aircraft in accordance with all legal requirements;
- Maintain professional and social relationships with others in developing, conducting and promoting safe aviation operations.

Aviation Management and Operations

The aviation management and operations (AMO) specialization is designed to prepare students for career positions with airports, general aviation facilities, airlines, corporations, engineering and consulting firms, other organizations specializing in aviation and auxiliary businesses whose primary customers are aviation-oriented and who require individuals with an aviation background.

The AMO specialization provides an interdisciplinary approach to management and technology systems and their application to the aviation environment. A benefit of the program is that a student can utilize the educational background in other disciplines, such as facility management or general management. The curriculum focus is on aviation, management, technical systems operation and safety.

First year (30-32 hours)

AERT 224, 240 (6)
 BA 203 (3)
 DESN 104 (3)
 IPC 102 (3)
 ENG 112 (3)
 MATH 128 or 130 (3-5)
 MIS 200 (3)
 STAT 200 (3)
 TECH 101 (3)

Second year (34 hours)

TECH 289 (4)
 CONS 235 (3)
 IPC 201, 207 or 306 (3)
 SOC 101 (3) (meets social science requirement)
 General education (6)
 Technology electives (3)
 ARCH 236 (3)
 DESN 131 (3)
 ECON 200 or 202 (3) (meets social science requirement)
 ECT 191, 196 or TECH 102 (3)

Third year (31 hours)

ACCT 325 (3)
 AERT 348, 349, 354 (9)
 MGMT 305 or AERO 311 (3)
 JOUR 341 (3)
 TECH 389 (4)
 General education (6)
 TECH 302 (3) (meets social science requirement)

Fourth year (31 hours)

AERT 352, 456, 490 (9)
 CONS 442 (3)
 TECH 489 (4)
 General education core (3)
 Supplemental focus (9)
 Technical degree elective (3)

Aviation Technical Management

The aviation technical management (ATM) specialization is designed to prepare students for aviation careers with organizations and companies that engage in the manufacture or maintenance of aviation components or which provide aviation products or services.

The ATM specialization provides an interdisciplinary and practical approach to management and technology systems and their application to the aviation environment. Its intent is to further develop or supplement an individual who has an FAA airframe and power plant (A&P) license or a strong technical or vocational background. A benefit of the program is that a student can utilize the educational background in other technology disciplines, such as manufacturing, production or general management. The curriculum focus is on aviation, management, technical systems operation and safety.

First year (30-32 hours)

AERT 240 (3)
 BA 203 (3)
 ENG 112 (3)
 MIS 200 (3)
 DESN 104 (3)
 IPC 102 (3)
 MATH 128 or 130 (3-5)
 ECT 191, 196 or TECH 102 (3)
 TECH 101 (3)
 MFG 112 (3)

Second year (32-34 hours)

ECT 240, 241 (8)
 DESN 131 (3)
 PHYS 201 (5) (meets natural science requirement)
 SOC 101 (3) (meets social science requirement)

STAT 200, 211 or MATH 126 (3-5)
TECH 289 (4)
General education core (6)

Third year (33 hours)

Supplemental focus (3)
Technology elective (3)
DESN 243 (3)
MGMT 300 (3)
MGMT 305, or AERO 311 (3)
PHYS 202 (5) (meets natural science requirement)
TECH 389 (4)
General education core (3)
ECON 200 or 202 (3) (meets social science requirement)
TECH 302 (3) (meets social science requirement)

Fourth year (34 hours)

ACCT 325 (3)
AERT 348, 349, 352, 354, 405, 490 (18)
TECH 489 (4)
Technology degree elective (3)
Supplemental focus (6)

Flight Technology and Operations

The flight technology and operations (FTO) specialization prepares the student for a career as a commercial pilot for the airlines, air cargo companies, corporate or business operations, or numerous general aviation positions such as agriculture, flight training, charter, air freight and sightseeing. Flight and ground instruction is accomplished in strict accordance with Federal Aviation Regulations Part 141 and other pertinent regulations. Upon successful completion of the FTO specialization, the student will hold the following FAA certificates and ratings: Commercial Pilot-Airplane with single/multi-engine and instrument rating; Flight Instructor-Airplane single engine and instrument rating.

First year (30-34 hours)

AERT 220, 222 (6)
AERT 224, 240 (6)
MIS 200 (3)
ENG 112 (3)
ECT 191, 196 or TECH 102 (3)
IPC 102 (3)
MATH 128 or 130 (3-5)
TECH 101 (3)

Second year (31-33 hours)

AERT 280, 281 (6)
AERT 223 (2)
IPC 201 (3)
SOC 101 (3) (meets social science requirement)
PSYC 201 (4) (meets social science requirement)
TECH 289 (4)
GEOG 213 (3)
MATH 126, 131 or STAT 200 (3-5)
General education core (3)

Third year (33 hours)

AERT 282, 320, 321 (9)
MGMT 305 or AERO 311 (3)
PHYS 201 (5) (meets natural science requirement)
TECH 389 (4)

Supplemental focus (3)
General education core (6)
Technology elective (3)

Fourth year (31 hours)

AERT 352, 354, 349, 404, 405 (15)
TECH 489 (4)
General education core (3)
Supplemental focus (6)
TECH 302 (3) (meets social science requirement)

Construction Management and Technology

264 Technology, 372-2439
www.bgsu.edu/colleges/technology/Construc

The construction management and technology curriculum prepares personnel for construction contractors, engineering/architectural firms, public agencies and trade associations. The program is accredited by the American Council for Construction Education (ACCE), the accrediting agency for four-year baccalaureate degree programs in construction, construction science, construction management and construction technology.

The construction management and technology concentration requires coursework in general education, natural sciences, mathematics, business, technology, design and construction. The graduate of the construction management and technology program receives the bachelor of science in technology degree and seeks a career such as a project manager, estimator, scheduler, project inspector, superintendent or material representative.

The cooperative education program is a required program which integrates each student's employment with classroom academic work. Students may also participate in the Student Construction Management Association, which is a combination of the student chapters of the Associated General Contractors (AGC), the National Association of Home Builders (NAHB) and the Ohio Contractors Association (OCA).

Students must meet specific requirements for this degree outlined in the following sample schedule.

Learning Outcomes

Upon completion of the baccalaureate degree, students in construction management and technology are expected to:

- Communicate effectively in oral presentations, writing technical reports and critiquing the work of others;
- Exhibit construction business skills that include construction financing, business management and personnel management;
- Apply construction management skills that include cost estimating and control, construction scheduling, construction safety, construction methods and materials, ethics in construction, construction technical skills and computer applications in construction.

First year (33-34 hours)

ARCH 105 (3)
CONS 101 (2)
CONS 235 (3)
DESN 131 (3)
ENG 112 (3)
MATH 126, 131 or 134, 135 (5-6)
PHYS 201 (5) (meets natural science requirement)
TECH 101 (3)
General education core (6)

Second year (32-33 hours)

ARCH 236 (3)
DESN 243 (3)
ECON 202 (3) (meets social science requirement)
PHYS 202 or GEOL 104 (4-5) (meets natural science requirement)
STAT 200 (3)
TECH 289 (4)
TECH 302 (3) (meets social science requirement)
General education core (6)
Safety course (3)

Third year (31 hours)

ACCT 325 (3)
CONS 318, 320, 335, 336 (12)
ENG 388 (3)
LEGS 301 (3)
MGMT 305 (3)
TECH 389 (4)
Technology degree elective (3)

Fourth year (34 hours)

CONS 406, 439, 442 (9)
CONS 435, 440, 470 (9)
TECH 489 (4)
Business elective (6)
Technology elective (6)

Electronics and Computer Technology

264 Technology, 372-2439
www.bgsu.edu/colleges/technology/Electronic

As industries become more automated and society becomes more dependent on electronic data communication, the demand increases for professionals who can make informed decisions based on technical knowledge and experience. That is why the electronics and computer technology program at Bowling Green State University has such a progressive curriculum. Electronics and computer technology is a comprehensive study of diverse areas such as computer hardware and interfacing; digital communication and networking; computer-based instrumentation, data acquisition and process control. Emphasis is placed on the practical application of physics, mathematics and computer science to the study of electronics and computer technology. This knowledge is blended with a core study of manufacturing, design, business and general education to develop the whole person as well as flexibility for career responsibilities and advancement. An important component of this technology curriculum is a cooperative education program which integrates students' industrial employment with classroom academics.

Students may participate in activities related to the Electric Vehicle Institute, which is involved with design and testing of electric motors, electronic controllers and instrumentation systems.

Students may also participate in the student section of the Instrument Society of America (ISA) by attending technical meetings and exhibitions. They may also elect to become involved with the Electrical Manufacturing and Coil Winding Association (EMCWA) by attending and making presentations at its annual conference. Scholarships are available from both ISA and EMCWA.

Graduates of the program receive a bachelor of science in technology degree and enter careers as a systems engineer, computer engineer, product development engineer and process engineer.

Learning Outcomes

Upon completion of the baccalaureate degree, students in electronics and computer technology are expected to:

- Demonstrate awareness and understanding of technical knowledge and abilities in electronics and computer technology;
- Demonstrate ability to operationalize computer applications relevant to electronics and computer technology;
- Demonstrate a knowledge of industrial and commercial applications relevant to electronics and computer technology;
- Demonstrate functional understanding of business operations and management techniques.

First year (31 hours)

CS 101 (3)
 DESN 104 (3)
 ENG 112 (3)
 ECT 196 (3)
 General education core (6)
 MFG 112 (3)
 Math requirement (10)

Second year (32 hours)

ECT 240, 241 (8)
 General education core (9)
 IPC 306 (3)
 PHYS 201 (5) (meets natural science requirement)
 STAT 200 (3)
 TECH 289 (4)

Third year (34 hours)

Business electives (6)
 ECT 300, 344, 442 (9)
 ECT 358 (4)
 CS 205 (3)
 PHYS 202 (5) (meets natural science requirement)
 TECH 302 (3) (meets social science requirement)
 TECH 389 (4)

Fourth year (28 hours)

Business electives (6)
 ECT 441, 443, 453, 486 (12)
 Technology electives (6)
 TECH 489 (4)

♦Manufacturing Technology

264 Technology, 372-2439
 www.bgsu.edu/colleges/technology/Manufac

The specializations in the manufacturing technology program prepare students to be technical problem solvers in industry. Computer usage in designing, monitoring and controlling manufacturing processes, including robotics and automated work cells, is an important part of this program. An important component of this technology program and its specializations is the required cooperative education experience in industry which is University supervised. In addition to the technical emphasis, the program offers excellent opportunities for studies in management and science. There are several specializations offered under this program: applied materials science, applied quality science, industrial environmental technology, physical plant and energy utilization, and general manufacturing.

Learning Outcomes

Upon completion of the baccalaureate degree, students in manufacturing technology are expected to:

- Apply contemporary oral, written and graphic skills to communicate effectively in manufacturing;
- Apply the science and technology of production to contemporary manufacturing practices;
- Working in industrial teams, apply the principles of management, cost accounting and quality assurance.

Applied Materials Science

This specialization prepares students for responsible and technical positions related to engineering materials within the manufacturing industry. It provides a strong science base and applies this to engineering materials. Graduates may be employed in positions dealing with material processing, material testing, material quality control, mechanical design and materials development.

First year (32 hours)

ENG 112 (3)
 PHYS 201 (5) (meets natural science requirement)
 CHEM 127, 128 (5) (meets natural science requirement)
 General education (3)
 MATH 131 (5)
 MFG 112 (3)
 CHEM 125 (5) (meets natural science requirement)
 STAT 200 (3)

Second year (32 hours)

TECH 289 (4)
 CS 101 (3)
 PHYS 202 (5) (meets natural science requirement)
 General education (3)
 IPC 102 (3)
 DESN 243 (3)

MATH 232 (5)
 MGMT 300 (3)
 MFG 220 (3)

Third year (31-33 hours)

TECH 389 (4)
 Technology electives (2-4)
 General education (3)
 ENG 388 (3)
 PHYS 301, 307, 311 (7)
 MFG 235 (3)
 TECH 302 (3) (meets social science requirement)
 Business degree electives (6)

Fourth year (29-32 hours)

TECH 489 (4)
 MFG 326, 329, 438 (9)
 Materials science course (3)
 Technology degree electives (3-4)
 BIOL 446 (4)
 MFG 490 (3-5)
 General education (3)

Applied Quality Science

This specialization draws upon a wide variety of disciplines to help prepare students to solve industrial problems including those related to quality of materials, process and human issues, and others. The program offers excellent opportunities for applications of theory obtained from the study of management, statistics, operations research, physics and other areas.

First year (31 hours)

ENG 112 (3)
 ECT 196 (3)
 DESN 131 (3)
 General education (3)
 TECH 102 (3)
 MATH 128, 131 (10)
 IPC 102 (3)
 MFG 112 (3)

Second year (33 hours)

STAT 211, 212 (6)
 MFG 235 (3)
 TECH 289 (4)
 DESN 204 (3)
 MIS 200 (3)
 PHYS 201 (5) (meets natural science requirement)
 General education (6)
 MFG 220 (3)

Third year (33 hours)

MGMT 300 (3)
 PHYS 202 (5) (meets natural science requirement)
 OR 380 (3)
 MFG 326, 327, 329, 340 (12)
 TECH 302 (3) (meets social science requirement)
 General education (3)
 TECH 389 (4)

Fourth year (31 hours)

MGMT 441 (3)
 TECH 489 (4)
 ENG 388 (3)
 MFG 426, 427, 428, 430 (12)
 STAT 414 (3)
 ECT 441 (3)
 General education (3)

Industrial Environmental Technology

This specialization consists of studies in industrial technology, business and the sciences. The technical component concentrates on industrial pollution control applied to manufacturing and process control. Study in business emphasizes consideration of the organizational, legal and financial principles involved. The sciences, primarily chemistry and biology, provide students with knowledge on the chemical nature of pollutants and their effect on the ecological system.

First year (33 hours)

CS 101 or MIS 200 (3)
 CHEM 125 (5) (meets natural science requirement)
 ENG 112 (3)
 MFG 112 (3)
 MATH 128 (5)
 CHEM 127 (3) (meets natural science requirement)
 CHEM 128 (2) (meets natural science requirement)
 TECH 101, 102 (6)
 General education (3)

Second year (33 hours)

General education (3)
 ECON 200 (3) (meets social science requirement)
 MATH 126 (5)
 ARCH 105 (3)
 MFG 220 (3)
 BIOL 204 (5) (meets natural science requirement)
 STAT 200 (3)
 ENVH 304 (4)
 TECH 289 (4)

Third year (33 hours)

DESN 404 (3)
 MFG 235 (3)
 MFG 329 (3)
 MGMT 300 (3) (prerequisite STAT 200)
 MFG 326 (3)
 General education (3)
 ENVR 421 (3)
 BIOL 205 (5) (meets natural science requirement)
 TECH 389 (4)
 IPC 102 (3)

Fourth year (32 hours)

LEGS 301 (3)
 ARCH 307 (3)
 ENG 388 (3)
 MFG 327, 424, 438 (9)
 ENVH 403 (4)
 TECH 302 (3) (meets social science requirement)
 TECH 489 (4)
 MGMT 305 (3)

Manufacturing

This specialization prepares technical problem solvers for manufacturing industries. The technical component provides the student with the understanding of manufacturing materials, processes and systems for improving productivity in the industrial environment. The student also studies business and management techniques, and

achieves a solid foundation in communications, mathematics, science and the humanities. Graduates are commonly employed as manufacturing or process engineers, or technologists.

First year (31 hours)

MIS 200 (3)
 DESN 131 (3)
 ECT 196 (3)
 IPC 102 (3)
 ENG 112 (3)
 MFG 112 (3)
 MATH 126, 128 (10)
 General education (3)

Second year (33 hours)

DESN 204 or 243 (3)
 ECON 200 (3) (meets social science requirement)
 ENVH 307 (3)
 General education (6)
 MFG 220 (3)
 MFG 240 (3)
 PHYS 201 (5) (meets natural science requirement)
 STAT 200 (3)
 TECH 289 (4)

Third year (31 hours)

ECT 310 (3)
 General education (3)
 MFG 326, 327, 329 (9)
 MGMT 300 (3)
 Technology elective (3)
 TECH 302 (3) (meets social science requirement)
 TECH 223 (3)
 TECH 389 (4)

Fourth year (28 hours)

ENG 388 (3)
 MFG 400, 424, 428, 430, 490 (15)
 TECH 323 (3)
 TECH 489 (4)
 General education (3)

Physical Plant and Energy Utilization

The energy utilization technologist may be employed in commercial or industrial areas and responsible for efficient, proper and economical use of the mechanical, electrical, thermal, nuclear, chemical and radiant sources of energy, which are applied to the production, processing and transportation of goods and materials and the heating, cooling and ventilating of physical plants.

The physical plant technologist may be employed in the following areas: plant layout and design, construction and installation of equipment, maintenance, repairs and replacement, operation of utilities, and plant and industrial engineering roles.

First year (29 hours)

ENG 112 (3)
 General education (3)
 Math requirements (5)
 TECH 101, 102 (6)
 IPC 102 (3)
 ECT 191 (3)
 ARCH 105 (3)
 BIOL 101 (3) (meets natural science requirement)

Second year (34 hours)

ECON 200 or 202 (3) (meets social science requirement)
 MIS 200 (3)
 PHYS 201 (5) (meets natural science requirement)
 CONS 235 (3)
 CHEM 109, 110 (4) (meets natural science requirement)
 MFG 220 (3)
 TECH 223 (3)
 TECH 289 (4)
 STAT 200 (3)
 ENVS 101 (3) (meets social science requirement)

Third year (31 hours)

MGMT 300 (3)
 DESN 404 (3)
 CONS 337 (3)
 ECT 300 (3)
 ENVR 421 (3)
 General education core (6)
 TECH 323 (3)
 TECH 391 (3)
 TECH 389 (4)

Fourth year (31 hours)

Business electives (3)
 ENG 388 (3)
 ARCH 436 (3)
 MGMT 305 (3)
 ECT 357 (3)
 CONS 320 (3)
 ENVH 307 (3)
 TECH 302 (3) (meets social science requirement)
 TECH 454 (3)
 TECH 489 (4)

♦Mechanical Design

260 Technology, 372-2437
www.bgsu.edu/colleges/technology/Design

This program prepares the student to design products, tools and machines for manufacturing processes, and to deal with the practical aspects of mechanical and manufacturing design in industry. Designers in industry serve society by creating new products and redesigning existing ones that need improvement. These designers may create simple tools, complex machines or consumer products. Several aspects need to be considered when designing such as economics, physics and aesthetics. Is the new product efficient? Can it be manufactured easily? Is the new product pleasing to the eye? These are all considerations that a mechanical designer must face.

The mechanical design program at Bowling Green consists of a concentration of technology, business and general education courses. BGSU uses the latest computer aided design (CAD) software, milling machines, lathes and other industrial equipment. Classes are designed to give a well-rounded perspective of the manufacturing industry while giving one the experience of designing a given part or machine. Technical classes will include engineering graphics, materials processing, strength of materials and CAD.

An important component of this program is a cooperative education experience in a design or design-related position in industry which is supervised by College of Technology faculty or staff.

Aside from the classes, students can get involved in the Society for Manufacturing Engineers (SME) or the Student Mechanical Design Association which consists of faculty and students of manufacturing and mechanical design. This is an exciting way to learn more about the field and the people who are involved.

Learning Outcomes

Upon completion of the baccalaureate degree, students in mechanical design are expected to:

- Demonstrate oral, written, graphic and listening skills as they apply to mechanical design;
- Implement the various forms of technology necessary to complete mechanical design management;
- Demonstrate an understanding of materials and methods as they apply to mechanical design including the interpretation of mechanical design specifications and the identification of appropriate codes;
- Apply techniques and principles of management systems, including team building, to mechanical design problems;
- Conceptualize and complete a mechanical design project including cost estimating and scheduling.

First year (33 hours)

MFG 112 (3)
CS 101 (3)
DESN 104, 204 (6)
DESN 131, 231 (6)
ECT 196 (3)
ENG 112 (3)
MATH 128 (5)
TECH 289 (4)

Second year (32 hours)

ECON 200 (3) (meets social science requirement)
DESN 243, 304 (6)
MFG 220 (3)
MFG 235 (3)
General education core (3)
PHYS 201, 202 (10) (meets natural science requirement)
TECH 389 (4)

Third year (31 hours)

DESN 305 (3)
General education (6)
TECH 223, 302, 323 (9)
STAT 200 (3)
DESN 404 (3)
MGMT 305 (3)
TECH 489 (4)

Fourth year (25 hours)

Elective (4)
DESN 452 (3)
General education (3)
MFG 326, 329 (6)
MGMT 361 (3)
Business degree elective (3)
ENG 388 (3)

♦Technology Education

260 Technology, 372-2437
365 Education, 372-7372
www.bgsu.edu/colleges/technology/TechEd

In conjunction with the College of Education, the technology education program prepares students to be qualified technology education teachers able to provide leadership in the technology education field. The study of technology education contains both a component of a general education and an integration of other disciplines or technologies through application-based, problem-solving courses.

Students in the Technology Education Program are required to participate in a semester-long field experience (student teaching). In addition, technology education majors may choose to participate in the college's cooperative education program. This semester-long, full-time paid work experience enables students to apply knowledge gained in the classroom to real work situations.

Teacher education majors or practicing teachers in comprehensive science, physics, chemistry, biology, earth science, social studies, environmental science or computer science may earn certification to teach technology education by completing a technical core of 36 hours.

Learning Outcomes

Upon completion of the baccalaureate degree, students in technology education are expected to:

- Develop competencies in critical thinking, problem solving, reading, writing, speaking and computation;
- Develop technical competencies requisite to teach the various technologies;
- Design, implement and evaluate instruction using appropriate methodologies which focus on problem solving and decision-making skills;
- Develop a working knowledge of the interdisciplinary nature of technology and strategies for the integration of technology.

First year (33 hours)

ENG 112 (3)
IPC 102 (3)
EDFI 202 or EDCI 202 (3)
DESN 104 or ARCH 105 (3)
MFG 112 (3)
TECH 101 or MIS 200 (3)
ECT 196 (3)
CONS 235 (3)
TECH 102 (3)
DESN 131 (3)
General education (3)

Second year (33 hours)

PSYC 201 (4) (meets social science requirement)
VCT 203 (3)
MATH 128 (5)
MFG 220 (3)
MFG 322 (3)
TE 252 (3)
Technology degree elective (6)
General education (6)

Third year (29 hours)

EDFI 302 (3)
TE 352 or TECH 303 (3)
TE 462 (3)
EDSE 311 (2)
TECH 323 (3)
TECH electives (3)
EDFI 402 (3)
TECH 302 (3) (meets social science requirement)
General education (6)

Fourth year (28 hours)

TE 497 Student teaching (10)
EDAS 409 (3)
EDFI 408 (3) (meets cultural diversity requirement)
TE 449 (3)
TE 447 (3)
Technology electives (6)

♦Visual Communication Technology

260 Technology, 372-2437
www.bgsu.edu/colleges/technology/VCT

The visual communication program prepares students in the processes used to transmit ideas and concepts through visual media. The program offers theory and practice in the computer applications of visual media including multi-media, print, video, exhibitry and photography. With the help of a faculty adviser, each student selects an area for specialization from numerous career opportunities. The program proceeds through a framework of analyzing and applying the many methods of creating, reproducing and distributing visual communication materials. Students ultimately combine concepts, theories and principles with critical and creative technical problem-solving abilities to generate solutions for visual communication problems.

By developing the ability to solve communication problems, students will be prepared for such technological production and management positions as graphic coordinator, digital media specialist, video producer or editor, multi-media producer, print/video/photo sales representative or printing/publishing plant manager. Supervised cooperative work experience provides students with "real world" experience in their area of interest.

Learning Outcomes

Upon completion of the baccalaureate degree, students in visual communication technology are expected to:

- Demonstrate critical-thinking skills as they relate to solving visual problems;
- Conceptualize and implement a visual solution in several media modes;
- Demonstrate operational level skill ability in each of the visual media areas of VCT;
- Research and produce an organized written rationale for using a specific medium to solve a specific visual problem;
- Apply knowledge of industrial applications to visual communication related technologies.

First year (29-31 hours)

VCT 282 (3)
DESN 104 (3)
ENG 112 (3)
Math requirement (5-7)
VCT 203 (3)
VCT 204 (3)
VCT 208 (3)
General education (6)

Second year (31 hours)

MIS 200 or CS 101 (3)
IPC 102 or 306 (3)
ARTD 211 (3)
VCT 308 (3)
VCT 368 (3)
General education (9)
TECH 289 (4)
STAT 200 (3)

Third year (34 hours)

MKT 300 (3)
VCT cognate (12)
TECH 389 (4)
TECH 302 (3) (meets social science
requirement)
ACCT 221 (3)
General education (6)
Electives (3)

Fourth year (30 hours)

VCT cognate (15)
VCT 467 (3)
MGMT 305 (3)
TECH 489 (4)
ENG 388 (3)
Elective (2)

Minors

No minors are currently available in the College of Technology. The Electronics and Computer Technology Program is, however, in the process of developing a minor that will consist of 21 hours of coursework from that program. Although no minor is required students in the college may choose to earn a minor offered by another college.