Purdue School of Engineering and Technology

Welcome to the Purdue School of Engineering and Technology!

The Purdue School of Engineering and Technology offers undergraduate and graduate programs that prepare students for careers in industry. The school is one of the largest degree-granting schools at IUPUI, with an enrollment of approximately 2,500 students. All degrees are awarded by Purdue University, with the exception of those awarded through the Department of Music & Arts Technology.

History

The School of Engineering and Technology was formed in 1972 and is the successor to Purdue University programs that began in Indianapolis in 1940. The first Purdue University courses in the city were defense training courses sponsored by the U.S. Office of Education. After World War II, the curriculum was changed from a certificate to a diploma program. Three technical-institute programs were established: drafting and mechanical technology, electrical technology, and supervision and production technology. Ten students graduated at the first commencement in 1947. Freshman engineering courses were added in 1948; the Bachelor of Science in Engineering degree was first offered in 1969.

Today the school offers undergraduate and graduate programs leading to Purdue University degrees. Several of the programs have transfer and articulation agreements with a few Indiana colleges and universities as well as with international institutions abroad.

Overview

Vision and Mission of the School

The vision of the Purdue School of Engineering and Technology at IUPUI is to be one of the best urban university leaders in the disciplines of engineering and technology.

The mission of the Purdue School of Engineering and Technology at IUPUI is to provide for our constituents:
• high quality, well-rounded, and relevant educational experiences in an urban environment;
• opportunities to develop technical proficiency, leadership, and lifelong learning skills;
• outreach and accessibility to the broader community through civic engagement;
• excellence in the pursuit of basic and applied research, scholarship, and creative activity; and
• activities that support the intellectual and economic development of business, industry, government, and community stakeholders.

The current strategic plan for the School of Engineering and Technology is located on its Web site: www.engr.iupui.edu/.

Update on 11/17/2011

Accreditation & Licenses

- Computer Engineering Technology
- Construction Engineering Management Technology
- Electrical Engineering Technology
- Mechanical Engineering Technology
- Computer & Information Technology
- Computer Graphics Technology

The programs listed above are accredited by the engineering Technology Accreditation Commission (ETAC) or ABET, http://www.abet.org

- Mechanical Engineering
- Electrical Engineering
- Computer Engineering
- Biomedical Engineering

The programs listed above are accredited by the Engineering Accreditation Commission (EAC) of ABET, http://www.abet.org

- Interior Design Technology (accredited by Council of Interior Design Accreditation (CIDA) and National Association of Schools of Art and Design (NASAD))

Contact Information

Purdue School of Engineering and Technology Technology Building (ET) 215
799 W. Michigan Street
Indianapolis, IN 46202 (317) 274-2533 etinfo@iupui.edu

Requirements

Graduate Admission Requirements

Students who hold a baccalaureate degree from an accredited institution with a grade point average (GPA) of 3.00 on a 4.00-point scale, or with an overall “B” grade equivalent may be considered for admission to graduate degree programs in the School of Engineering and Technology. International applicants must submit official test score reports from the Educational Testing Service (ETS) for the Test of English as a Foreign Language (TOEFL) to be considered for admissions. Some graduate programs require official test scores for the Graduate Record Exam (GRE) from both domestic and international applications.

Undergraduate Admissions

Admission is based on evidence presented by individual applicants to show that they are capable of profiting from and contributing to one of the academic programs of the school. Inquiries about admission to engineering and technology programs, as well as requests for admission applications, should be addressed to the IUPUI Office of Admissions, 420 University Boulevard, Campus Center 255, Indianapolis, IN 46202-5140.

Undergraduate Engineering Admission Requirements

In determining the qualifications of an applicant to undergraduate engineering programs, the Office of Admissions uses the following criteria:

- Graduation from a high school accredited by a state Department of Public Instruction.
- The extent to which the student meets or exceeds the following minimum requirements:
- High School GPA of 3.0.
- Completion of Core 40 including chemistry and 4 years of math including trigonometry or pre-calculus.
- Minimum SAT scores of 550 math and 480 critical reading or ACT scores of 24 math and 20 verbal.

- All applicants who have not completed a full year of college work are required to take the College Entrance Examination Board (CEEB), Scholastic Assessment Test (SAT), or American College Test (ACT). For admission to the engineering programs, minimum SAT scores of 480 verbal (critical reading) and 550 mathematics or minimum ACT scores of 20 English and 23 mathematics are required.
- Because of a limitation on the total number of applicants that may be accepted as first-year students, out-of-state admissions may close at any time. When it becomes necessary to limit the number of Indiana residents accepted for a specific program, students will be offered admission to an alternate program or admission to the desired program for a subsequent semester.

Undergraduate Technology Admission Requirements

In determining the qualifications of an applicant to undergraduate technology programs, the Office of Admissions uses the following criteria:

- Graduation from a high school accredited by a state Department of Public Instruction.
- The extent to which the student meets or exceeds the following minimum requirements:
- Complete Academic Honors Diploma, Core 40, or equivalent, with
- High School GPA of 3.0 or higher, OR
- Minimum SAT scores of 500 math and 450 verbal/critical reading, or equivalent ACT scores of 21 math and 19 verbal.

- All applicants who have not completed a full year of college work are required to take the College Entrance Examination Board (CEEB), Scholastic Assessment Test (SAT), or American College Test (ACT).
- Because of a limitation on the total number of applicants that may be accepted as first-year students, out-of-state admissions may close at any time. When it becomes necessary to limit the number of Indiana residents accepted for a specific program, students will be offered admission to an alternate program or admission to the desired program for a subsequent semester.

Transfer Students

Transfers

From IUPUI Schools, Indiana University Campuses, or Purdue University Campuses

Students wishing to transfer from these schools must have a minimum cumulative grade point average of 2.0 on a 4.0 scale and be in good academic and disciplinary standing. The required minimum cumulative grade point average may be higher in some programs. Students must follow the procedures listed below. After reviewing the transfer request and supporting materials, the school will inform students in writing of the acceptance or rejection of the application.

- IUPUI students or students in the IU system wishing to transfer into the School of Engineering and Technology must apply directly to their intended department. Transfers from the School of Engineering and Technology to another IUPUI school must be processed by the transfer school's recorder.
- A Purdue University student from another campus must complete an official undergraduate application through the IUPUI Office of Admissions.
- If a student seeking admission to the School of Engineering and Technology previously has been dismissed for academic reasons, he or she must file a petition for readmission that will be reviewed by the Committee on Readmissions. The petition may be obtained from the New Student Academic Advising Center, School of Engineering and Technology, 723 W. Michigan Street, Room 174, Indianapolis, IN 46202.

From Other Colleges and Universities

Applicants transferring from colleges and universities other than Indiana University or Purdue University must fulfill the following requirements:

- An IUPUI application for undergraduate admission and a copy of high school records must be submitted to the Office of Admissions.
- An official transcript of all course work done, from all institutions previously attended, also must be forwarded to the Office of Admissions.
- For admission to an engineering or technology program, residents of Indiana must have a cumulative grade point average of at least 2.0 on a 4.0 scale, and out-of-state applicants must have an average of at least 2.5, for all courses previously taken at a recognized college or university. Transfer credits are evaluated by the Office of Admissions and distributed by the Office for Academic Programs in coordination with the department in which the student enrolls.
- There is a residency requirement to receive a degree: transfer students must complete a program of study that includes at least 32 credit hours for a bachelor's degree and at least 15 credit hours for an associate degree in the School of Engineering and Technology. For the associate degree, at least 6 out of the 15 credits are expected to be in the major. For the bachelor's degree, at least 12 out of the 32 credits are expected to be in the major at the junior level or higher.
- Individual academic programs may require that transfer students complete specific courses prior to admission with advanced standing.
- Transfer students must be in good academic and disciplinary standing at the college(s) previously attended. Students who have been dismissed for academic reasons by another college or university, or who have less than a 2.0 grade point average, must file a petition for readmission that will be reviewed by the committee on readmissions. The petition form may be obtained from the New Student Academic Advising

Center, 723 W. Michigan Street, Room 174, Indianapolis, IN 46202.

Transfer students may receive credit in the School of Engineering and Technology for successfully completed course work of equivalent amount and character from another accredited college. However, if a student changes to a different course of study in the process of transferring from another college or university, credits for certain courses may not be applicable toward requirements in the new curriculum.

Transfer credit is not granted for work done at institutions that are not fully approved by a regional accrediting association of secondary schools and colleges. In addition to regional association approval, certain programs may require accreditation by professional organizations and/or societies before credit will be considered for transfer. Credit will not be transferred from any institution whose regional accreditation designation is A/V (Associate/Vocational-Technical).

The only exception is when agreements exist that specify courses or blocks of credit that will transfer into specific Purdue University degree programs.
Graduates of unaccredited institutions, proprietary institutions, or institutions accredited only as occupational training institutions are encouraged to review their academic plans carefully before seeking advanced credit. All prospective transfer students are encouraged to write or visit the school for further information about their opportunities.

To Other Indiana University Campuses

Indiana University credits transferred from one campus of Indiana University to another will be evaluated and accepted in terms at least as favorable as credits transferred from other accredited institutions in the United States. No review of the credits will be undertaken except on good-faith terms, using the same criteria as those used in evaluating external credits.

Special Expenses

Fees and Payment Procedures

University Fees

All fees are due and payable by the due date on the student's schedule confirmation and are subject to change without notice by action of the Trustees of Indiana University. A complete listing of all fees is published for each term in the class schedule. Extra laboratory fees may be charged when appropriate and when laboratory instruction is required.

Residency Status

The criteria for establishing in-state residency and thus qualifying for in-state fee rates are very strict. Inquiry about establishing resident status for fee purposes should be made to the registrar, who is the proper source of this information. Contact the Office of the Registrar, Campus Center, Room 250, 420 N. University Boulevard, IUPUI, Indianapolis, IN 46202; phone (317) 274-1519 or visit http://registrar.iupui.edu/resident.html

General Fees

In order to support programs, services, and facilities that benefit all students at IUPUI each semester students are charged a fee. All students include every person enrolled in a credit bearing course - and may be graduate, undergraduate, full and/or part time.

Often these fees are mistaken for certain optional fees for which students may or may not choose. This fee is not optional and must be paid by all students.

More information is available at http://www.iupui.edu/~fees/

Late Enrollment and Late Program Change Fees

All classes are considered closed following final registration for a specific term. Schedule changes after that date are considered a special privilege and require special authorization and an additional fee. The student should refer to the appropriate class schedule for a listing of these fees.

The School of Engineering and Technology does not normally allow any student to register after expiration of the 100 percent refund period. (See "Refunds" in this section of the bulletin.)

Special Credit Fees

The Trustees of Indiana University have approved the following fee structure for special credit:

1. If the credit is awarded as a result of an examination within the first three semesters following matriculation, there is no charge.
2. If the credit is awarded as a result of an examination and the student is a first-semester transfer student, there is a nominal fee per credit hour.
3. If the credit is awarded as a result of an examination and the student does not meet either of the above conditions, the charge per credit hour is at the regular resident or nonresident rate.
4. If the credit is awarded as a result of experience or credentials, the student will be charged a nominal fee per credit hour.

Auditing Fees

An audit form must be presented to the Office of the Registrar from a student's school or division to audit a course for record. No grades or credits are received for audits. If a course is changed from credit to audit after the first week of classes, a late program change fee will be assessed.

Students who desire an official record of auditing a particular course will be charged full tuition. Written permission from the instructor must be obtained before a student may register to audit. Courses with a laboratory component may not be audited.

Other Fees

Students may also be required to pay special fees for the following services: housing, locker rental, parking, recreation, student identification card (depending on enrollment status and anticipated use), and transcript request. A complete listing of special fees is provided each term in the IUPUI *Schedule of Classes and IUPUI* Web site.

Payment Procedures

Payments must be made in cash or by bank draft, express order, postal money order, traveler's check, personal check, MasterCard, Visa, or Discover for the exact amount of fees due at the time of registration. For information about this fee payment, refer to the IUPUI *Schedule of Classes or IUPUI* Web site www.iupui.edu.

Refunds
Refund credits are determined by the date the drop activity is processed by the IUPUI Office of the Registrar. For information about refunds, refer to http://bursar.iupui.edu/Help/default.htm.

To be eligible for a refund, the student must officially notify the Office of the Registrar at the time of withdrawal. Refund information for summer sessions and courses scheduled from 1 to 8 weeks in length is published in the *IUPUI Schedule of Classes*.

Financial Aid
It is the goal of IUPUI to encourage students in their educational endeavors and to reduce financial barriers. IUPUI recognizes that many students and their parents cannot afford to finance a college education entirely from their own income and assets. For this reason, a program of financial assistance is available to admitted and enrolled students who have a demonstrated financial need. Aid is available in the form of scholarships, grants, and loans.

Students desiring further information about any of the following financial aid programs should write to:

Office of Student Financial Services Campus Center 250 420 N. University Boulevard IUPUI Indianapolis, IN 46202-5147 phone: (317) 274-4162 Web: http://www.iupui.edu/~finaid/

Application Procedures
Potential financial aid recipients must complete the Free Application for Federal Student Aid (FAFSA), which is available from high schools, on the Web, or at the Office of Student Financial Services. The priority application deadline for any summer session and/or the following academic year is March 1, although applications will be processed as long as funds are available. Students who apply late should plan on finding other funds to pay for tuition and books until their financial aid applications are processed.

Eligibility
Financial aid awards are given on the basis of need as determined by the information supplied on the FAFSA. IUPUI students enrolled for 6 or more credit hours are eligible if need is demonstrated. The amount of the award will be less for part-time students than for full-time students; full-time student status is considered to be 12 or more credit hours. Only regularly admitted students and transient students from Purdue University are eligible.

Types of Aid
Financial aid is generally offered as a package consisting of a combination of scholarships, grants, loans, and/or work-study awards, although awards may vary with individual students. All awards are subject to the availability of funds.

Scholarships
Scholarships are awarded on the basis of academic achievement. Sources of scholarships may be both inside and outside IUPUI. Scholarship awards are often not based on need, and the student does not pay back the award later. An applicant will be contacted by IUPUI if you are eligible to apply for scholarships; if an application is required, it will be sent automatically.

Grants
Grants are awarded on the basis of need only and do not have to be repaid by the student.

Student Loans
Unlike scholarships and grants, loans must be repaid. Several different student loan programs are available at IUPUI. Some are based on financial need; some are not. Interest rates and maximum awards vary by program. Contact the Office of Student Financial Services for details.

Part-Time and Summer Employment
Many students who attend IUPUI are able to earn part of their expenses through part-time and summer employment. The IUPUI Office of Student Employment, 815 W. Michigan Street, Taylor Hall Third Floor (317) 274-4856, offers help in finding part-time jobs and maintains current information about part-time job opportunities. Students should contact this office for further information on employment assistance.

Work-Study Program
The Federal College Work-Study Program available at IUPUI was established by the Higher Education Act of 1965. The main purpose of the program is to give eligible students the chance to do paid work that will complement their academic programs and career aspirations. Students who have been admitted to IUPUI may apply through the Office of Student Financial Services.

Veterans Benefits
Information on benefits, including Veterans Administration paid tutorial assistance and work-study opportunities, is available from the veterans affairs representative at the Campus Center, Theater Level (lower Level), 420 University Blvd., IUPUI, Indianapolis, IN 46202; (317) 278-9163, or visit http://veterans.iupui.edu/.

General Requirements
Undergraduate Engineering Requirements

To earn a Bachelor of Science in Engineering (B.S.E.), Bachelor of Science in Biomedical Engineering (B.S.B.M.E.), Bachelor of Science in Computer Engineering (B.S.Cmp.E.), Bachelor of Science in Electrical Engineering (B.S.E.E.), or Bachelor of Science in Mechanical Engineering (B.S.M.E.), students must satisfy the following requirements. Requirements for graduation include receiving credit in all required courses: at least 130 credit hours in the biomedical engineering program, 129 credit hours in the computer engineering program, 129 credit hours in the electrical engineering program, 131 credit hours in the engineering management program, 130 credit hours in the interdisciplinary engineering program, or 130 credit hours in the mechanical engineering program.

Each student must have an approved plan of study that lists all courses for the specific degree program. Students should prepare their plans of study for approval during the junior year. If a student wants to deviate from the published curricula, written permission of the administrator of the program is required.

Additional requirements include the following:

1. Students must complete the program of study for the degree by resident course work, by examination, or by credit accepted from another institution. The dean may refuse to

accept as credit toward graduation any course that was completed 10 or more years previously, and former students will be notified of all such decisions upon reentering. Substitution of courses required for graduation may be made by the dean of the school.
2. Students must complete at least two semesters of resident study at IUPUI, and they must complete at least 32 credit hours of appropriate course work, of which 12 credit hours must be completed in the major at the junior level or higher. Students are also expected to complete the senior year in residence: however, with the approval of the dean, students who have had at least four semesters of resident study may complete a maximum of 20 credit hours of the senior year in another approved college or university. For the purpose of this rule, two summer sessions are considered equivalent to one semester.
3. Students must be in active student status in the School of Engineering and Technology in order to have the degree awarded. (approved by Faculty Senate March 2013)
4. Students must have an index of 2.0 in required engineering courses in addition to an overall graduation index of 2.0 for all courses on the approved plan of study. Students who have completed all other requirements for a bachelor's degree but have failed to meet the minimum graduation index may register for additional courses, with the approval of an authorized representative of the dean, after a review of their record. The additional courses may not exceed 20 credit hours. Students may take a maximum of 9 of the 20 credit hours in another approved college or university, provided the courses are approved in advance and in writing by an authorized representative of the dean of the School of Engineering and Technology. A copy of the approval must be filed in the office of the engineering and technology recorder. Credit in these additional courses must be established within five years of the date on which all other degree requirements were met. Students will have fulfilled the requirements for graduation if graduation indexes, including extra courses, equal or exceed the minimum specified at the time when all other graduation requirements were satisfied.
5. Applicants for a second bachelor's degree, after they are admitted to the second bachelor's degree program, must complete at least 32 credit hours of appropriate course work, of which 12 credit hours must be completed in the major at the junior level or higher.
6. Courses taken under the Pass/Fail option and courses taken by correspondence may not be used to fulfill graduation requirements for engineering students.

Undergraduate Technology Requirements

Associate Degree

To earn an Associate of Science (A.S.) degree, students must satisfy the following requirements:
1. Students must complete the plan of study for the degree by resident course work, by examination, or by credit accepted from another institution. The dean of the school may refuse to accept as credit toward graduation any course that was completed 10 or more years previously, and former students will be notified of all such decisions upon reentering. Substitutions of courses required for graduation may be made by the dean of the School of Engineering and Technology.
2. Students must complete at least two semesters of resident study at IUPUI, and they must complete at least 15 credit hours of appropriate course work, of which 6 credit hours must be in the major. Students are generally expected to complete the entire second year in residence; however, with the approval of the dean of the school, students who have at least three semesters of resident study may complete a maximum of 16 credit hours of the second year in another approved college or university. For the purpose of this rule, two summer sessions are considered equivalent to one semester.
3. Students must be in active student status in the School of Engineering and Technology in order to have the degree awarded. (approved by Faculty Senate March 2013)
4. Students must have a minimum graduation index of 2.0. Students who have completed all other requirements for an A.S. degree but have failed to meet the minimum graduation index (the average of grades earned in courses required for a degree) may register for additional courses, with the approval of an authorized representative of the dean of the school, after a review of their record. These additional courses may not exceed 10 credit hours, and credit in these courses must be established within three years of the date on which all other degree requirements were met. Students will have fulfilled the requirements for graduation if their graduation indexes, including the extra courses, equal or exceed the minimum specified at the time when all other graduation requirements were satisfied.
5. Applicants for a second A.S. degree must complete at least 15 credit hours at IUPUI of appropriate course work after admission to the second associate degree program. At least 6 of the 15 credit hours must be completed in the major. A second associate degree may not be earned in the same program.

Bachelor's Degree

To earn a Bachelor of Science (B.S.) degree, students must satisfy the following requirements.
1. Students must complete the program of study for the degree by resident course work, by examination, or by credit accepted from another institution. The dean may refuse to accept as credit toward graduation any course that was completed 10 or more years previously, and former students will be notified of all such decisions upon reentering. Substitution of courses required for graduation may be made by the dean of the school.
2. Students must complete at least two semesters of resident study at IUPUI, and they must complete at least 32 credit hours of appropriate course work, of which 12 credit hours are required to be in the major at the junior level or higher. Students are generally expected to complete the senior year in residence; however, with the approval of the dean, students who have had at least four semesters of resident study may complete a maximum of 20 credit hours of the senior year in another approved college or university. For the purpose of this rule, two summer sessions are considered equivalent to one semester.
3. Students must be in active student status in the School of Engineering and Technology in order to have the degree awarded. (approved by Faculty Senate March 2013)
4. Students must have a minimum graduation index of 2.0. Students who have completed all other requirements for a bachelor's degree but have failed to meet the minimum graduation index may register for additional courses, with the approval of an authorized representative of the dean, after a review of their record. The additional courses may not exceed 20 credit hours. Students may take a maximum

of 9 of the 20 credit hours in another approved college or university, provided the courses are approved in advance and in writing by an authorized representative of the dean of the School of Engineering and Technology. A copy of the approval must be filed in the Office of the Recorder. Credit in these additional courses must be established within five years of the date on which all other degree requirements were met. Students will have fulfilled the requirements for graduation if graduation indexes, including extra courses, equal or exceed the minimum specified at the time when all other graduation requirements were satisfied.
5. Applicants for a second bachelor's degree must complete at IUPUI at least 32 credit hours of appropriate course work after they are admitted to the second bachelor's degree program. At least 12 of the 32 credit hours must be completed in the major at the junior level or higher.

Second Bachelor's Degrees

Applicants for a second bachelor's degree, whose first degree was from an institution other than IUPUI, IU or Purdue, must complete at IUPUI at least 32 credit hours of appropriate course work after they are admitted to the second bachelor's degree program. At least 12 of the 32 credit hours must be completed in the major at the junior level or higher.

Engineering and Technology Minors

Minimum criteria for academic minors offered within the School of Engineering and Technology will include an overall 2.0 GPA; a grade of C– or above for each course required for the minor; and at least one-half of the required courses for the minor must have been completed in residency at IUPUI. Any courses (e.g., Web-based courses or courses via the Internet) delivered by an IUPUI school are considered to be residence courses for this purpose. The academic requirements for each minor offered by the school will consist of at least 21 semester hours.

Certificate Programs

Students who are seeking one of the certificate programs offered by the School of Engineering and Technology must qualify for admission under the published criteria of the academic unit at IUPUI and must complete at least one-half of the required courses at IUPUI. Any courses (e.g., Web-based courses or courses via the Internet) delivered by an IUPUI school are considered to be residence courses for this purpose.

Internship and Cooperative Education Programs

Good career opportunities almost always require previous work experience. While earning a degree at the Purdue School of Engineering and Technology, Internship and Cooperative Education Programs provide essential opportunities to launch a career.

The lessons that students learn in classes and laboratories receive their ultimate test through the school's cooperative education, internship, professional work experience, and international student exchange programs. The school interacts with a broad variety of area companies to provide the technical experience required to succeed in today's globally competitive economic markets.

The Cooperative Education Program (Co-op) is a five-year professional development experience, designed to combine practical on-the-job experiences with the classroom training of a four-year college curriculum; the Internship Program allows students to work full time or part time for an employing organization while simultaneously taking courses during one semester. This internship program allows flexibility for students who wish to obtain work experience, but are not able to take a semester away from school as is required in the co-op program.

The greater metropolitan Indianapolis community offers a number of employment enrichment opportunities through extensive professional, governmental, and manufacturing resources. Our community resources provide rich, practical, well-paid professional opportunities generally unavailable at residential campuses.

After students have satisfactorily completed the first year of the academic program, they have a choice of employment programs to meet their needs.

Eligibility

To be eligible for one of the Internship/Cooperative Education Programs, a student must:
1. be admitted to the Purdue School of Engineering and Technology, IUPUI;
2. be enrolled in one of the academic programs offered by the school;
3. continue in one of the school's Bachelor of Science degree programs;
4. have satisfactorily completed the first year of an academic program;
5. meet and maintain minimum GPA requirements;
6. register for the appropriate Employment Enrichment Programs course before each work period;
7. satisfactorily complete the work period requirements;
8. attend a co-op/internship orientation session.

During periods of professional employment, students will earn a competitive salary and might also earn academic credit toward the bachelor's degree. The amount and distribution of credit is determined by the student's academic department. For further information, contact the Office of Student Placement Services, Engineering and Technology Building (ET) 141, 799 W. Michigan Street, IUPUI, Indianapolis, IN 46202-5160; (317) 274-0805.

Undergraduate

The School of Engineering and Technology is unique in offering programs in both engineering and engineering technology. What is the difference between the two areas? Engineering students learn the principles and theories needed to plan, design, and create new products and are more likely to use broad analytical skills in achieving engineering solutions. Technology students learn technical methods and practices to become experts who apply technology to solve industrial problems.

Undergraduate Engineering Degree Programs

Programs for full-time students pursuing bachelor's degrees in engineering are presented in this section. The admission requirements, curricula, graduation requirements, and course descriptions of each program listed are those that were in effect at the time of printing and may subsequently change. Students are encouraged to obtain the latest course and curriculum information from their academic advisors.

The following undergraduate engineering degree programs are available in the School of Engineering and Technology:

- Bachelor of Science in Biomedical Engineering (BSBME)
- Bachelor of Science in Computer Engineering (BSCmpE)
- Bachelor of Science in Electrical Engineering (BSEE)
- Bachelor of Science in Energy Engineering (BSEEN)
- Bachelor of Science in Engineering (BSE)
- Bachelor of Science in Mechanical Engineering (BSME)
- Bachelor of Science in Motorsports Engineering (BSMSTE)

Undergraduate Engineering Curriculum

All undergraduate engineering curricula in this bulletin are presented as four-year programs. Well-qualified students with excellent high school preparation should be able to complete all requirements in four years or less. Students with gaps in their high school preparation or those who participate in the Cooperative Education Program may require more time to complete their degrees. Other students may adjust their semester credit loads to maintain employment or for other reasons. Programs can be tailored for part-time and evening students, as classes are scheduled for both day and evening. Part-time and evening students are urged to consult their advisors to avoid future scheduling problems.

It is important for students to recognize that some flexibility is provided in each of the curricula to allow for individual differences in backgrounds and academic goals. It is students' responsibility to consult with an academic advisor to design a program to fit personal needs.

Creative accomplishment in an engineer's career often derives from an education that stresses major ideas and fundamental concepts of engineering rather than specific technologies. Engineering curricula provide wide experience in mathematical, physical, and engineering sciences as well as in social sciences and the humanities. In this way a student obtains both thorough training in engineering and a well-rounded education. Such an approach provides the best preparation for an engineer who must envision and develop the technologies of the future and deal with scientific advances.

Engineers are responsible for translating the ever-expanding reservoir of scientific knowledge into systems, devices, and products and for further expanding knowledge. To meet these responsibilities, those who are learning to be engineers must not only master the ideas of others but must also originate new ideas. Moreover, although engineers deal extensively with facts and scientific fundamentals as a matter of course, they cannot rely on these alone. Engineers inevitably face decisions that cannot be made only on the basis of technical skills, but that require a broad understanding of human values and behavior as developed by studies in the social sciences and humanities. They must also be able to accommodate situations where judgment and wisdom, combined with scientific knowledge or technical skills, can provide a solution.

Minor in Business for Engineering Students

Indiana University Kelley School of Business and the School of Engineering and Technology have established a minor in business for engineering students. To qualify for the minor, students must meet course prerequisites and entrance requirements. In certain cases, substitutions are permitted for some requirements. Please consult with a Kelley School of Business academic advisor for more information: (317) 274-2147. Application deadlines are March 1 for the summer and fall semesters, and October 1 for the spring semester. Applications are available in the undergraduate office, Indiana University Kelley School of Business, Business/SPEA Building 3024.

Freshman Engineering Program

Director of Freshman Engineering: D. King
Senior Lecturer: P. Orono
Lecturer: P. Gee
Assistant Professor of Engineering, Part-Time and Academic Advisor: N. Lamm

All qualified students interested in pursuing an engineering degree at IUPUI are admitted to the Freshman Engineering Program. This includes second-degree and transfer students as well as beginning students.

While in this program, beginning students complete the basic sequence of courses common to all engineering majors. These courses include calculus I and II, chemistry and physics for science and engineering majors, English composition, and public speaking. Freshman engineering courses taken by all students include: ENGR 19500 Introduction to the Engineering Profession and ENGR 19600 Introduction to Engineering. The Freshman Engineering Program provides students with an opportunity to explore the various engineering disciplines before making a commitment to a specific curriculum.

Transfer and second-degree students remain in Freshman Engineering until the evaluation of their transfer credits is completed.

The New Student Academic Advising Center (NSAAC) has a full-time staff available year round. Prospective students and their families are invited to contact the NSAAC regarding any questions they may have concerning engineering and the engineering degree programs offered at IUPUI. The advisors in the NSAAC provide academic counseling and advising to prospective and continuing students. New students in engineering receive individualized attention while completing the basic core of freshman engineering courses. Transfer and second-degree students likewise work closely with freshman engineering advisors until all transfer credit issues are resolved. The office has an open-door policy, and students are encouraged to consult with advisors about any issues that might affect their academic progress.

Technology Degree Programs

The School of Engineering and Technology offers a variety of technology programs at the associate and bachelor's degree levels. Programs for full-time students pursuing these technology departments are presented in this section. Although the school sets the normal length of time needed to complete each degree program, the required time may vary for individual students. For example, well-qualified students with excellent high school preparation may complete

a program in less than the length of time indicated. Other students who decide to combine cooperative (co-op) education or internships with their course work may take more time to complete all degree requirements. Students may adjust their course loads for job or personal reasons, and plans of study can be tailored to meet the needs of part-time and evening students. Needing to study over a longer time should be no obstacle to completing the program successfully.

Associate of Science

Science and technology activities range from the applied and practical to the highly theoretical and abstract. At one extreme are the theoretical scientists; at the other are the mechanics, draftspersons, and service personnel. Within this spectrum, educational backgrounds include doctoral degrees, master's degrees, bachelor's degrees, and associate degrees at the university level, as well as certificates and diplomas from other postsecondary educational and training institutions.

The Associate of Science degree offered in the School of Engineering and Technology at IUPUI is awarded upon successful completion of two years of university-level study in applied science. Graduates of these programs are called technicians.
Technicians' jobs require applying technical knowledge and skills and, normally, the manipulative skills necessary to perform technical tasks.

Technicians have considerable knowledge of the materials and processes involved and are equipped with the ability to apply the principles of physical and biological sciences, generally using instruments rather than tools. Their job contribution is mainly through mental activity, combined with applied skills. In many organizations the technician can move up in the organization to higher levels of responsibility, if he or she is capable and is willing to pursue further education.

The following associate degree programs are offered by the School of Engineering and Technology at IUPUI:

Architectural Technology: Department of Design & Communication Technology
Biomedical Engineering Technology: Department of Engineering Technology
Interior Design: Department of Design & Communication Technology

Bachelor of Science

The Bachelor of Science degree is awarded under the "two-plus-two" education plan. A student following this plan first earns an associate degree in two years and then may complete a bachelor's degree after two more years. Transfer students must meet all departmental requirements.

A student is awarded an Associate of Science degree upon successful completion of the two-year program. This degree indicates that the person who receives it is educated at the technician level. These individuals may go directly into the work force, or they may decide to continue their studies. Students who want to continue may be admitted for an additional two years of bachelor's-level study in the various technology programs. Students who successfully complete such a program are awarded a Bachelor of Science degree, which provides the basis for increased job responsibility.

The following technology bachelor's degree programs are available to qualified students:

- Biomedical Engineering Technology
- Computer Engineering Technology
- Computer Graphics Technology
- Computer & Information Technology
- Construction Engineering Management Technology
- Electrical Engineering Technology
- Interior Design Technology
- Mechanical Engineering Technology
- Music Technology
- Organizational Leadership and Supervision

For more specific information, see the advisors in the respective departments.

* Jointly offered with Purdue University, West Lafayette.
** See Department of Music & Arts Technology section of this bulletin.

Awards & Scholarships

The Purdue School of Engineering and Technology offers scholarships through IUPUI's Office of Student Scholarships. Early admission to IUPUI is the best way to be assured of scholarship opportunities. The Purdue School of Engineering and Technology offers scholarships to incoming freshmen and continuing students. Most scholarships are merit-based awards offered at the departmental level, but some are designated specifically for new students, or for minority, women, and other students from underrepresented populations.

Information on all scholarships can be found at http://www.iupui.edu/~scentral/

Scholastic Recognition

Dean's List

All undergraduate students in the School of Engineering and Technology who complete at least 6 credit hours during a semester, who have a semester grade point average of 3.8 or higher, a cumulative GPA of 2.5 or higher, and who are approved by the program faculty are placed on the Dean's List. These honor students receive certificates from the Dean recognizing their meritorious efforts. ***Approved by Faculty Senate on May 12, 2009 with policy effective fall 2009.***

Graduation with Distinction

By awarding degrees "With Distinction" or "With Highest Distinction" the School of Engineering and Technology recognizes the outstanding scholastic achievement of selected associate and bachelor's degree candidates.

Distinction at graduation is awarded on the basis of all course work taken for letter grades. Individuals must complete all the requirements for their field of study and meet the following conditions:

- A candidate for the bachelor's degree with distinction must have earned at least 65 hours of credit in the Purdue University or Indiana University system. A candidate for an associate degree with distinction must have earned at least 35 hours of credit in the Purdue University or Indiana University system.

- Honors are awarded according to the following cumulative semester grade point averages:
- Top 10 percent—With Distinction
- Top 30 percent of the top 10 percent—With Highest Distinction

Note: For the purpose of determining graduation honors, the calculated cumulative semester grade point average includes all courses taken for a grade in either the Purdue or the Indiana University system, regardless of when the courses were taken.

Students who are awarded their degrees with distinction receive corresponding diplomas and are given special recognition during the annual Commencement exercise.

Degree Programs

Engineering Degree Programs

- Bachelor of Science in Biomedical Engineering (BSBME)
- Bachelor of Science in Computer Engineering (BSCmpE)
- Bachelor of Science in Electrical Engineering (BSEE)
- Bachelor of Science in Energy Engineering (BSENE)
- Bachelor of Science in Engineering (BSE)
- Bachelor of Science in Mechanical Engineering (BSME)
- Bachelor of Science in Motorsports Engineering (BSMSTE)

Technology Degree Programs

Associate of Science (A.S.) degrees with a major field of study in one of the following:

- Architectural Technology
- Biomedical Engineering Technology
- Interior Design Technology

Bachelor of Science (B.S.) degrees with a major field of study in one of the following:

- Biomedical Engineering Technology
- Computer Engineering Technology
- Computer Graphics Technology
- Computer & Information Technology
- Construction Engineering Management Technology
- Electrical Engineering Technology
- Interior Design Technology
- Mechanical Engineering Technology
- Music Technology
- Organizational Leadership and Supervision

Design & Communication Technology

Architectural Technology, A.S.

Upon completion of this program, students will be able to:

1. Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of components, programs and systems encountered in the degree program's courses.
2. Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions.
3. Identify, analyze and solve technical problems as required in the degree program's courses.
4. Apply and/or design components, systems and software programs in their specialty area.
5. Conduct, analyze and interpret experiments, and assess results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner.
7. Demonstrate ability to organize work done by team members.
8. Write technical reports; present data and results coherently in oral and graphic formats.
9. Demonstrate skills for life-long learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources and participating in industry conferences, trade organizations/societies and continuing educational opportunities.
10. Demonstrate ethical conduct as described in the university student code of conduct.
11. Demonstrate knowledge of professional code of ethics.
12. Demonstrate a respect for diversity as described in the university civility statement.
13. Recognize contemporary professional, societal and global issues in case studies and course projects.
14. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Computer Graphics Technology, B.S.

Upon completion of this program, students will be able to:

1. Demonstrate an ability to correctly demonstrate and implement computer literacy practices.
2. Demonstrate an ability to effectively apply algebra and trigonometry principles appropriate to visual communication projects and applications.
3. Demonstrate an ability to analyze a specific problem, by identifying and defining the component parts of the problem, properly documenting the principles requirements of the solution(s), and effectively documenting and reporting the associated requirements appropriate to its solution(s).
4. Demonstrate an ability to design, implement and evaluate a computer-based system, process, component, or programs to meet desired visual communication needs.
5. Demonstrate an ability to function effectively on teams and in a collaborative setting to accomplish a common goal.
6. Demonstrate an understanding of professional, ethical, legal (including copyright), security, and social issues and responsibilities.
7. Demonstrate an ability to communicate effectively with a wide range of audiences, and diverse populations in both domestic and international settings.
8. Demonstrate an ability to analyze the local and global impact of computer generated images and applications on individuals, organizations, and society.

9. Demonstrate an ability to demonstrate how to identify professional development needs, and implement a plan to ensure continuing professional development.
10. Demonstrate an ability to demonstrate how to identify and use current techniques, skills, and tools necessary for computing practice related to visual communication problems.

Interior Design Technology, A.S. and B.S.
Upon completion of this program, students will be able to:

1. Demonstrate technical knowledge and application of the design process.
2. Solve problems that are quantitative in nature.
3. Analyze complex issues and apply sound design methodology in multidisciplinary fields of interior design technology.
4. Practice effective communication skills in, oral, written and visual presentations.
5. Increase knowledge and demonstrate solutions sensitive to health, safety and welfare of the public.
6. Work collaboratively and effectively in technology and design related industries.
7. Continue Professional advancement through life-long learning.
8. Understand the environmental, ethical, diversity, cultural and contemporary aspects of their work.
9. Be responsible citizens.

Technical Communication Certificate
Upon completion of this program, students will be able to:

1. Demonstrate that they have the core knowledge, skills, and professional practices necessary for entry-level technical communicators.
2. Demonstrate their ability to gather and transform technical knowledge for a variety of audiences.
3. Design, develop, and edit effective, usable publications using rhetorical principles and current technology.

Student Learning Outcomes

The School of Engineering & Technology has organized its Student Learning Outcomes (SLOs) by department. Please choose the appropriate department in the links below, or the left-hand navigation, and then find the program you are looking for. You can also click the link for the program below and it will take you directly to that program's SLOs. Students in all programs will graduate with a Bachelor of Science degree unless otherwise noted.

Please note that certificate program learning outcomes can be found under the appropriate department below the degree program learning outcomes. Any questions or concerns about the Student Learning Outcomes should be directed to the department of the program in question, or the Office of Academic Programs in ET 215.

Engineering

- Biomedical Engineering
- Biomedical Engineering

- Electrical and Computer Engineering
- Electrical Engineering

- Computer Engineering

- Mechanical Engineering
- Mechanical Engineering
- Energy Engineering

- Motorsports Engineering

Technology

- Computer Information and Graphics Technology
- Computer & Information Technology
- Computer Graphics Technology
- Computer Technology Applications Certificate
- E-Commerce Certificate
- Information Technology Certificate
- Network Security Certificate

- Engineering Technology
- Biomedical Engineering Technology
- Computer Engineering Technology
- Construction Engineering Management Technology
- Electrical Engineering Technology
- Interior Design
- Mechanical Engineering Technology
- Motorsports Engineering
- Construction Management Certificate
- Motorsports Engineering Technology Certificate
- Quality Assurance Certificate

- Technology Leadership and Communication
- Organizational Leadership & Supervision
- Technical Communication
- Human Resource Management Certificate
- International Leadership Certificate
- Leadership Studies Certificate
- Technical Communication Certificate

- Music & Arts Technology*
- Music Technology

*Music & Arts Technology students are awarded Indiana University degrees.

Biomedical Engineering, B.S.B.M.E.

Upon completing the undergraduate B.M.E. degree, our students will possess:

1. An ability to apply knowledge of mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. An ability to function on multi-disciplinary teams.
5. An ability to identify, formulate, and solve engineering problems.

6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. A recognition of the need for, and an ability to engage in lifelong learning.
10. A knowledge of contemporary issues.
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
12. An understanding of biology and physiology.
13. The capacity to apply advanced mathematics (including differential equations and statistics), science and engineering to solve problems at the interface of engineering and biology.
14. The ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and non-living materials and systems.

Music & Arts Technology

Music Technology, B.S.

Upon completion of this program, students will be able to:

1. Think, speak, and write clearly and effectively.
2. Demonstrate acquaintance with mathematical and experimental methods of the physical and biological sciences; including analysis and historical and quantitative techniques
3. Address culture and history from a variety of perspectives.
4. Understand and experience thinking about moral and ethical problems.
5. Respect, understand, and evaluate work in a variety of disciplines.
6. Explain and defend one's views effectively and rationally.
7. Understand and have experience with art forms other than music.
8. Hear, identify, and work conceptually with the elements of music-rhythm, melody, harmony, and structure.
9. Understand compositional process, aesthetic properties of style, and the ways these shape and are shaped by artistic and cultural forces.
10. Demonstrate acquaintance with a wide selection of musical literature - the principal eras, genres, and cultural sources.
11. Develop and defend musical judgments.
12. Perform in areas appropriate to the student's needs and interests.
13. Sight read.
14. Understand procedures for realizing a variety of musical styles.
15. Demonstrate capacity to create derivative or original music both extemporaneously and in written form.
16. Compose and improvise at a basic level in one or more musical languages
17. Understand how technology serves the field of music as a whole.
18. Demonstrate a working knowledge of the technological developments applicable to their area of specialization.
19. Work independently on a variety of musical problems by combining their capabilities in performance; aural, verbal and visual analysis; composition and improvisation; and history and repertory.
20. Form and defend judgments about music.
21. Acquire the tools of work with a comprehensive repertory, including music from various cultures of the world and music of their own time.
22. Understand basic interrelationships and interdependencies among the various professions and activities that constitute the musical enterprise.
23. Acquire the skills necessary to assist in the development and advancement of their careers.
24. Develop teaching skills, particularly as related to their major area of study.
25. Develop improvisational skills in all areas of musicianship
26. Experience a broad range of repertory through attendance at events such as recitals, concerts, opera and music theatre productions, and other types of performances.
27. Explore areas of individual interest related to music in general or to the major.
28. Explore multidisciplinary issues that include music.
29. Practice synthesis of a broad range of musical knowledge and skills, particularly through independent study that involves a minimum of faculty guidance, where the emphasis is on evaluation at completion.

Computer, Information & Leadership Technology

Computer & Information Technology, B.S.

Upon completion of this program, students will be able to:

1. Demonstrate mastery of core computing and mathematical concepts.
2. Analyze user needs and identify the computing requirements appropriate to an IT solution.
3. Plan, design, implement, and evaluate IT-based systems to meet desired needs.
4. Function effectively on teams to accomplish a common goal.
5. Acknowledge diverse opinions in regards to professional, ethical, legal, and social issues in a global perspective.
6. Communicate effectively with a wide range of audiences.
7. Analyze and explain the impact of IT on individuals, organizations and societies.
8. Explain the need to engage in continuing professional development.
9. Use current technical concepts, techniques and practices in the information technologies within the student's area of expertise.
10. Apply the best practices and standards within the student's area of expertise.

Organizational Leadership Supervision, B.S.

Upon completion of this program, students will be able to:

1. Demonstrate and apply knowledge of:
1. the process and roles of leadership.

2. leadership traits.
3. leadership behavior concepts.
4. situational approaches to leadership.
5. power and influence.
6. leading during times of uncertainty, turbulence, and change.

2. Design and conduct research, as well as analyze and interpret data in order to:
1. evaluate their personal leadership effectiveness.
2. evaluate their organization's effectiveness and sustainability.
3. evaluate their organization's social and environmental impact.

3. Lead an organization, or processes and functions within it that meet or exceeds desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.
4. Function on multi-disciplinary teams.
5. Identify, formulate, and solve organizational problems.
6. Understand professional and ethical responsibility.
7. Communicate effectively verbally and nonverbally to all size audiences.
8. Understand the impact of leadership and supervision in a global, economic, environmental and societal context.
9. Demonstrate knowledge of contemporary organizational issues.
10. Use the techniques, skills, tools and concepts necessary for effective strategic and tactical planning.

Certificates

Computer Technology Applications Certificate
Upon completion of this program, students will be able to:

1. Use traditional application software at the highest level.
2. Customize and modify application software for end users.
3. Train end users of application software in best practices.
4. Research, learn, and apply new software techniques.
5. Create sophisticated and interactive Web interfaces using application software.
6. Use Web 2.0 tools to further their career.

E-Commerce Certificate
Upon completion of this program, students will be able to:

1. Apply tools and techniques for effective Web site planning and analysis.
2. Allow individuals to develop dynamic web applications in a variety of programming languages.
3. Explore sophisticated data management and information exchange as it applies to interactive and e-commerce applications.
4. Apply optimal Web design strategies to deploy usable Web applications for a global audience.
5. Utilize current web development standards appropriately.

Information Technology Certificate
Upon completion of this program, students will be able to:

1. Apply tools and techniques for effective Web site planning and analysis.
2. Introduce fundamental client and server side languages for developing dynamic websites.
3. Explore database development and technologies used to build database-driven web applications.
4. Apply optimal Web design strategies to deploy usable Web applications for a global audience.
5. Research, learn and apply new web technologies.

Network Security Certificate
Upon completion of this program, students will be able to:

1. Apply information assurance and security principles to secure systems and networks.
2. Conduct accurate and comprehensive digital forensics investigations and apply appropriate rules of evidence.
3. Use an appropriate analytic framework to assess risk and recommend strategies for mitigation.
4. Analyze and produce comprehensive security policies, standards, and procedures.
5. Analyze and create comprehensive business continuity plan to include incident response, disaster recovery, and continuous operations.

Human Resource Management Certificate
Upon completion of this program, students should be able to:

1. Describe, use, and evaluate tactical and strategic Human resource management principles.
2. Develop, implement and provide a safe and effective work environment.
3. Comply with local, state, and federal employment law and related public policies.
4. Promote training and development of individuals, work teams, and organizations.
5. Assess, design, develop, implement, and evaluate learning solutions in various organizational contexts.
6. Promote positive, productive employer-employee relationships.
7. Create, negotiate, and manage regulations concerning collective bargaining, grievance, and arbitration procedures.
8. Leverage compensation, benefits, rewards, and recognition to attract, motivate, and retain talent.
9. Develop policy, practice, and procedure to select talent aligned with the strategic direction of the organization.

International Leadership Certificate
Upon completion of this program, students will be able to:

1. Demonstrate techniques to analyze and solve intercultural problems that typically occur within diverse organizations.
2. Apply knowledge and techniques to devise strategies for successfully leading a diverse workforce within an international organization.
3. Use knowledge and techniques to devise strategies for successfully managing diversity within an international organization.
4. Demonstrate substantial knowledge of at least one foreign country, or region, (or distinct subculture within the USA), including demographic profile, economic status, political climate, commerce, history, language,

and cultural norms as a result of intensive experience and/or study.

Leadership Studies Certificate
Upon completion of this program, students will be able to:

1. Define and defend their personal philosophy of leadership and ethical behavior.
2. Describe behavior in organizational settings at the individual, team/group, and macro-organization levels.
3. Identify the stages of team development that occurs within organizations.
4. Make leadership-oriented decisions that are ethically, legally, morally, and strategically sound.
5. Apply concepts of supervisory management, team building, personnel selection and development, decision-making, resource allocation, conflict resolution, and strategic planning to the solving of individual, team/group, and organizational problems.
6. Explain the importance of attracting, managing, and motivating a globally-diverse workforce.
7. Improve individual and organizational performance by applying the appropriate leadership theories and processes in practice.
8. Evaluate the appropriateness of leadership behaviors in given situations, and make suggestions for improving those behaviors.

Mechanical Engineering

Mechanical Engineering, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate and apply knowledge of mathematics, science, and engineering with:
1. Chemistry and calculus-based physics in depth.
2. Mathematics through multivariate calculus, differential equations, and linear algebra.
3. Probability and statistics.
4. Mechanical engineering sciences: solid mechanics, fluid-thermal sciences, materials science, systems dynamics.

2. Conduct experiments methodically, analyze data, and interpret results.
3. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, with applications to:
1. Mechanical systems.
2. Thermal systems.

4. Function in teams to carry out multidisciplinary projects.
5. Identify, formulate, and solve engineering problems.
6. Understand professional and ethical responsibilities.
7. Communicate effectively in writing and orally.
8. Understand the impact of engineering solutions in a global, economic, environmental, and societal context through broad education
9. Recognize the need to engage in lifelong learning.
10. Demonstrate knowledge of contemporary issues.
11. Use the techniques, skills, and modern tools of engineering effectively and correctly in engineering practice with:
1. Mechanical engineering analysis tools. (e.g., ProMechanica)
2. Engineering design and manufacturing tools. (e.g., ProEngineer)
3. Internet and library information resources.
4. Mathematical computing and analysis tools. (e.g., Matlab, Excel, LabView, and C)

Energy Engineering, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate and apply knowledge of mathematics, science, and engineering with:
1. Knowledge in chemistry and calculus-based physics in depth.
2. Mathematics through multivariate calculus, differential equations, and linear algebra.
3. Probability and statistics a4. Energy engineering sciences: solid mechanics, fluid-thermal science, energy conversion, supply, and storage.

2. Design and conduct experiments methodically, analyze data, and interpret results.
3. Design a system, component, or process to meet desired needs with applications to energy systems.
4. Function in teams to carry out multidisciplinary projects.
5. Identify, formulate, and solve engineering problems.
6. Understand professional and ethical responsibilities.
7. Communicate effectively, in writing and orally.
8. Understand the impact of engineering solutions in a global and societal context through broad education.
9. Recognize the need to engage in lifelong learning.
10. Demonstrate knowledge of contemporary issues.
11. Use the techniques, skills, and modern tools of engineering effectively and correctly in engineering practice with:
12. Engineering analysis tools.
1. Engineering design and manufacturing tools. (e.g., ProEngineer)
2. Internet and library resources.
3. Mathematical computing and analysis tools. (e.g., Matlab,C, Excel, LabView)

Electrical & Computer Engineering

Computer Engineering, B.S.C.E.
Upon completion of this program, students will be able to demonstrate:

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. an ability to function on multidisciplinary teams.
5. an ability to identify, formulate, and solve engineering problems.
6. an understanding of professional and ethical responsibility.
7. an ability to communicate effectively.

8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. a recognition of the need for, and an ability to engage in lifelong learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Electrical Engineering, B.S.
Upon completion of this program, students will be able to demonstrate:

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. an ability to function on multidisciplinary teams.
5. an ability to identify, formulate, and solve engineering problems.
6. an understanding of professional and ethical responsibility.
7. an ability to communicate effectively.
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. a recognition of the need for, and an ability to engage in lifelong learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Engineering Technology

Biomedical Engineering Technology, A.S. and B.S.
Upon completion of tthis program, students will be able to:

1. Demonstrate knowledge and skills in the use of the electrical and/or computer components of medical equipment systems as encountered in the degree program's courses. Demonstrate a working medical vocabulary and knowledge of clinical safety requirements and regulations as encountered in the degree program's classes.
2. Use current knowledge of mathematics, science and emerging technology tools to solve problems and demonstrate solutions.
3. Identify, analyze and integrate the technical equipment requirements with the needs of medical staff and patients as required in the degree program's courses.
4. Apply and design solutions for issues identified in heallth care technology as demonstrated in a senior project.
5. Conduct, analyze and interpret experiments, and access results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for lifelong learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources.
9. Demonstrate ethical conduct as described in the university student code of conduct. Demonstrate knowledge of professional code of ethics.
10. Demonstrate a respect for diversity as described in the university civility statement. Recognize contemporary professionals, societal and global issues in case studies and course projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Computer Engineering Technology, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of microprocessors, programs, networks and systems encountered in the degree program's cources.
2. Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions.
3. Identify, analyze, and solve technical problems as required in the degree program's courses.
4. Apply and design hardware, systems, and software programs in their specialty area demonstrated in a senior project.
5. Conduct, analyze and interpret experiments, and assess results.
6. Function asa member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for lifelong learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources.
9. Demonstrate ethical conduct as described in the university student code of conduct. Demonstrate knowledge of the professional code of ethics.
10. Demonstrate respect for diversity as described in the university civility statement. Recognize contemporary professional, societal and global issues in case studies and course projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Construction Engineering Management Technology, B.S.
Upon completion of this program, students will be able to demonstrate:

1. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
3. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.

4. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.
5. An ability to function effectively in teams.
6. An ability to identify, analyze and solve technical problems.
7. An ability to communicate orally.
8. An ability to communicate writen and visual.
9. Recognition of the need for, and ability to engage in lifelong learning.
10. An ability to understand professional, ethical and social responsibilities.
11. A respect for diversity and knowledge of contemporary professional, societal and global issues.
12. A committment to quality, timeliness, and continuous improvement.

Electrical Engineering Technology, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of components, circuits, programs and systems encountered in the degree program's courses.
2. Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions.
3. Identify, analyze and solve technical problems as requires in the degree program's courses.
4. Apply and design components, circuits, systems and software programs in their specialty area as demonstrated in a senior project.
5. Conduct, analyze and interpret experiments and assess results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for lifelong learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources.
9. Demonstrate ethical conduct as described in the university student code of conduct. Demonstrate knowledge of professional code of ethics.
10. Demonstrate a respect for diversity as described in the university civility statement. Recognize contemporary professional, societal and global issues in case studies and course projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Mechanical Engineering Technology, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate an appropriate mastery of the knowledge, techniques, skills, and modern tools of their discipline within designated courses which provide laboratory components.
2. Apply current knowledge in mathematics, science, engineering and technology, and recognize emerging applications in these areas.
3. Conduct experiments, analyze and interpret experimental data, and apply experimental parameters in order to improve and/or modify processes.
4. Apply creativity in the design of systems, components, or processes within Mechanical Engineering Technology projects.
5. Function effectively as a member of a project team, or with group projects.
6. Identify, analyze , and solve technical problems.
7. Communicate effectively in written, oral and graphical modes.
8. Recognize the need for lifelong learning, and participate in educational and professional opportunities to expand your knowledge base.
9. Understand and communicate professional, ethical, and social responsibilities as a practitioner of MET.
10. Demonstrate a respect for diversity and a knowledge of contemporary professional, societal, and global issues.
11. Demonstrate via actions a commitment to quality, timeliness, and continuous improvement.

Biomedical Engineering Technology, A.S. and B.S.

At the time of graduation, students will be able to:

1. Demonstrate knowledge and skills in the use of the electrical and/or computer components of medical equipment systems as encountered in the degree program's courses. Demonstrate a working medical vocabulary and knowledge of clinical safety requirements and regulations as encountered in the courses of the degree program.
2. Use current knowledge of mathematics, science and emerging technology tools to solve problems and demonstrate solutions.
3. Identify, analyze and integrate the technical equipment requirements with the needs of medical staff and patients as required in the degree program.
4. Apply and design solutions for issues identified in heallth care technology as demonstrated in a senior project.
5. Conduct, analyze and interpret experiments, and access results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for continued self-directed learning and professional development.
9. Demonstrate ethical conduct as described in the university's Student Code of Conduct. Demonstrate knowledge of professional code of ethics.
10. Demonstrate a respect for diversity as described in the university Civility statement. Recognize contemporary professional, societal and global issues in case studies and course projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Electrical Engineering Technology

Electrical Engineering Technology, B.S.

At the time of graduation, students will be able to:

1. Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of components, circuits, programs and systems encountered in the degree program's courses.
2. Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions.
3. Identify, analyze and solve technical problems as required in the degree program's courses.
4. Apply and design components, circuits, systems and software programs in their specialty area as demonstrated in a senior project.
5. Conduct, analyze and interpret experiments and assess results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for life-long learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources.
9. Demonstrate ethical conduct as described in the university's Student Code of Conduct. Demonstrate knowledge of professional code of ethics. Demonstrate a respect for diversity as described in the university civility statement.
10. Recognize contemporary professional, societal and global issues in case studies and course projects. Identify appropriate standards and comply with them in course assignments, exams or projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Electrical Engineering Technology

Computer Engineering Technology, B.S.

Upon completion of this program, students will be able to:

1. Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of microprocessors, programs, networks and systems encountered in the degree program's courses.
2. Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions.
3. Identify, analyze, and solve technical problems as required in the degree program's courses.
4. Apply and design hardware, systems, and software programs in their specialty area as demonstrated in a senior project.
5. Conduct, analyze and interpret experiments, and assess results.
6. Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members.
7. Write technical reports; present data and results coherently in oral and graphic formats.
8. Demonstrate skills for life-long learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources.
9. Demonstrate ethical conduct as described in the university's Student Code of Conduct. Demonstrate knowledge of the professional code of ethics. Demonstrate a respect for diversity as described in the university cilility statement.
10. Recognize contemporary professional, societal and global issues in case studies and course projects. Identify appropriate standards and comply with them in course assignments, exams or projects.
11. Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience.

Construction Engineering Management Technology

Construction Engineering Management Technology, B.S.

At the time of graduation, astudent will be able to demonstrate:

1. An ability to select and apply the knowledge, skills and modern tools of the discipline to broadly defined engineering technology.
2. An ability to select and apply a knowledge of mathematics, science, engineering and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
3. An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments, and to apply experimental results to improve processes.
4. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program education objectives.
5. An ability to function effectively as a member or leader on a technical team.
6. An ability to identify, analyze and solve broadly-defined engineering technology problems.
7. An ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.
8. An understanding of the need for and an ability to engage in self-directed continuing professional development.
9. An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.
10. A knowledge of the impact of engineering technology solutions in a societal and global context.
11. A committment to quality, timeliness, and continuous improvement.

Mechanical Engineering Technology

Mechanical Engineering Technology, B.S.

At the time of graduation, a student will possess:

1. An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.
2. An ability to select and apply a knowledge of mathematics, science, engineering, and technology to

engineering technology problems that require the application of principles and applied procedures or methodologies.
3. An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; to apply experimental results to improve processes.
4. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.
5. An ability to function effectively as a member or leader on a technical team.
6. An ability to identify, analyze, and solve broadly-defined engineering technology problems.
7. An ability to apply written, oral, and graphical communication in both technical and nontechnical environments; an ability to identify and use appropriate technical literature.
8. An understanding of the need for and an ability to engage in self-directed continuing professional development.
9. An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.
10. Knowledge of the impact of engineering technology solutions in a societal and global context.
11. A commitment to quality, timeliness, and continuous improvement.

Construction Management Certificate

Construction Engineering Management Technology, B.S.

Upon completion of this program, students will be able to demonstrate:

1. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
3. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.
4. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.
5. An ability to function effectively in teams.
6. An ability to identify, analyze and solve technical problems.
7. An ability to communicate orally.
8. An ability to communicate writen and visual.
9. Recognition of the need for, and ability to engage in lifelong learning.
10. An ability to understand professional, ethical and social responsibilities.
11. A respect for diversity and knowledge of contemporary professional, societal and global issues.
12. A committment to quality, timeliness, and continuous improvement.

Motorsports Engineering Technology Certificate

Construction Engineering Management Technology, B.S.

Upon completion of this program, students will be able to demonstrate:

1. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
3. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.
4. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.
5. An ability to function effectively in teams.
6. An ability to identify, analyze and solve technical problems.
7. An ability to communicate orally.
8. An ability to communicate writen and visual.
9. Recognition of the need for, and ability to engage in lifelong learning.
10. An ability to understand professional, ethical and social responsibilities.
11. A respect for diversity and knowledge of contemporary professional, societal and global issues.
12. A committment to quality, timeliness, and continuous improvement.

Quality Assurance Certificate

Construction Engineering Management Technology, B.S.

Upon completion of this program, students will be able to demonstrate:

1. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
3. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.
4. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.
5. An ability to function effectively in teams.
6. An ability to identify, analyze and solve technical problems.
7. An ability to communicate orally.
8. An ability to communicate writen and visual.
9. Recognition of the need for, and ability to engage in lifelong learning.
10. An ability to understand professional, ethical and social responsibilities.
11. A respect for diversity and knowledge of contemporary professional, societal and global issues.
12. A committment to quality, timeliness, and continuous improvement.

Computer, Information & Leadership Technology

Computer & Information Technology, B.S.

Upon completion of this program, students will be able to:

1. Demonstrate mastery of core computing and mathematical concepts.
2. Analyze user needs and identify the computing requirements appropriate to an IT solution.
3. Plan, design, implement, and evaluate IT-based systems to meet desired needs.
4. Function effectively on teams to accomplish a common goal.
5. Acknowledge diverse opinions in regards to professional, ethical, legal, and social issues in a global perspective.
6. Communicate effectively with a wide range of audiences.
7. Analyze and explain the impact of IT on individuals, organizations and societies.
8. Explain the need to engage in continuing professional development.
9. Use current technical concepts, techniques and practices in the information technologies within the student's area of expertise.
10. Apply the best practices and standards within the student's area of expertise.

Organizational Leadership Supervision, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate and apply knowledge of:
1. the process and roles of leadership.
2. leadership traits.
3. leadership behavior concepts.
4. situational approaches to leadership.
5. power and influence.
6. leading during times of uncertainty, turbulence, and change.

2. Design and conduct research, as well as analyze and interpret data in order to:
1. evaluate their personal leadership effectiveness.
2. evaluate their organization's effectiveness and sustainability.
3. evaluate their organization's social and environmental impact.

3. Lead an organization, or processes and functions within it that meet or exceeds desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.
4. Function on multi-disciplinary teams.
5. Identify, formulate, and solve organizational problems.
6. Understand professional and ethical responsibility.
7. Communicate effectively verbally and nonverbally to all size audiences.
8. Understand the impact of leadership and supervision in a global, economic, environmental and societal context.
9. Demonstrate knowledge of contemporary organizational issues.
10. Use the techniques, skills, tools and concepts necessary for effective strategic and tactical planning.

Certificates

Computer Technology Applications Certificate
Upon completion of this program, students will be able to:

1. Use traditional application software at the highest level.
2. Customize and modify application software for end users.
3. Train end users of application software in best practices.
4. Research, learn, and apply new software techniques.
5. Create sophisticated and interactive Web interfaces using application software.
6. Use Web 2.0 tools to further their career.

E-Commerce Certificate
Upon completion of this program, students will be able to:

1. Apply tools and techniques for effective Web site planning and analysis.
2. Allow individuals to develop dynamic web applications in a variety of programming languages.
3. Explore sophisticated data management and information exchange as it applies to interactive and e-commerce applications.
4. Apply optimal Web design strategies to deploy usable Web applications for a global audience.
5. Utilize current web development standards appropriately.

Information Technology Certificate
Upon completion of this program, students will be able to:

1. Apply tools and techniques for effective Web site planning and analysis.
2. Introduce fundamental client and server side languages for developing dynamic websites.
3. Explore database development and technologies used to build database-driven web applications.
4. Apply optimal Web design strategies to deploy usable Web applications for a global audience.
5. Research, learn and apply new web technologies.

Network Security Certificate
Upon completion of this program, students will be able to:

1. Apply information assurance and security principles to secure systems and networks.
2. Conduct accurate and comprehensive digital forensics investigations and apply appropriate rules of evidence.
3. Use an appropriate analytic framework to assess risk and recommend strategies for mitigation.
4. Analyze and produce comprehensive security policies, standards, and procedures.
5. Analyze and create comprehensive business continuity plan to include incident response, disaster recovery, and continuous operations.

Human Resource Management Certificate
Upon completion of this program, students should be able to:

1. Describe, use, and evaluate tactical and strategic Human resource management principles.
2. Develop, implement and provide a safe and effective work environment.
3. Comply with local, state, and federal employment law and related public policies.

4. Promote training and development of individuals, work teams, and organizations.
5. Assess, design, develop, implement, and evaluate learning solutions in various organizational contexts.
6. Promote positive, productive employer-employee relationships.
7. Create, negotiate, and manage regulations concerning collective bargaining, grievance, and arbitration procedures.
8. Leverage compensation, benefits, rewards, and recognition to attract, motivate, and retain talent.
9. Develop policy, practice, and procedure to select talent aligned with the strategic direction of the organization.

International Leadership Certificate
Upon completion of this program, students will be able to:

1. Demonstrate techniques to analyze and solve intercultural problems that typically occur within diverse organizations.
2. Apply knowledge and techniques to devise strategies for successfully leading a diverse workforce within an international organization.
3. Use knowledge and techniques to devise strategies for successfully managing diversity within an international organization.
4. Demonstrate substantial knowledge of at least one foreign country, or region, (or distinct subculture within the USA), including demographic profile, economic status, political climate, commerce, history, language, and cultural norms as a result of intensive experience and/or study.

Leadership Studies Certificate
Upon completion of this program, students will be able to:

1. Define and defend their personal philosophy of leadership and ethical behavior.
2. Describe behavior in organizational settings at the individual, team/group, and macro-organization levels.
3. Identify the stages of team development that occurs within organizations.
4. Make leadership-oriented decisions that are ethically, legally, morally, and strategically sound.
5. Apply concepts of supervisory management, team building, personnel selection and development, decision-making, resource allocation, conflict resolution, and strategic planning to the solving of individual, team/group, and organizational problems.
6. Explain the importance of attracting, managing, and motivating a globally-diverse workforce.
7. Improve individual and organizational performance by applying the appropriate leadership theories and processes in practice.
8. Evaluate the appropriateness of leadership behaviors in given situations, and make suggestions for improving those behaviors.

Computer, Information & Leadership Technology

Computer & Information Technology, B.S.
Upon completion of this program, students will be able to:

1. Demonstrate mastery of core computing and mathematical concepts.
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3. Plan, design, implement, and evaluate IT-based systems to meet desired needs.
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1. evaluate their personal leadership effectiveness.
2. evaluate their organization's effectiveness and sustainability.
3. evaluate their organization's social and environmental impact.

3. Lead an organization, or processes and functions within it that meet or exceeds desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.
4. Function on multi-disciplinary teams.
5. Identify, formulate, and solve organizational problems.
6. Understand professional and ethical responsibility.
7. Communicate effectively verbally and nonverbally to all size audiences.
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4. Apply optimal Web design strategies to deploy usable Web applications for a global audience.
5. Utilize current web development standards appropriately.

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5. Assess, design, develop, implement, and evaluate learning solutions in various organizational contexts.
6. Promote positive, productive employer-employee relationships.
7. Create, negotiate, and manage regulations concerning collective bargaining, grievance, and arbitration procedures.
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9. Develop policy, practice, and procedure to select talent aligned with the strategic direction of the organization.

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3. Use knowledge and techniques to devise strategies for successfully managing diversity within an international organization.
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Upon completion of this program, students will be able to:

1. Define and defend their personal philosophy of leadership and ethical behavior.
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4. Make leadership-oriented decisions that are ethically, legally, morally, and strategically sound.
5. Apply concepts of supervisory management, team building, personnel selection and development, decision-making, resource allocation, conflict resolution, and strategic planning to the solving of individual, team/group, and organizational problems.
6. Explain the importance of attracting, managing, and motivating a globally-diverse workforce.
7. Improve individual and organizational performance by applying the appropriate leadership theories and processes in practice.
8. Evaluate the appropriateness of leadership behaviors in given situations, and make suggestions for improving those behaviors.

Graduate Programs

M. Razi Nalim, Associate Dean for Research and Graduate Programs

The School of Engineering and Technology offers five graduate degrees at the M.S. level: Master of Science in

Biomedical Engineering (M.S.Bm.E.), Master of Science in Electrical and Computer Engineering (M.S.E.C.E.), Master of Science in Mechanical Engineering (M.S.M.E.), Master of Science in Engineering (M.S.E.), and Master of Science (M.S.).

Qualified students may pursue Ph.D. degrees in biomedical engineering, electrical and computer engineering, or mechanical engineering at IUPUI through programs jointly administered with the respective schools at Purdue University, West Lafayette. Students are usually expected to complete the M.S.E.C.E. or M.S.M.E. before pursuing the Ph.D. degree.

Students completing a master's or doctoral degree in engineering will be prepared to enter the work force at a high level of responsibility and expertise. Knowledge of the dynamics of expanding new technologies and the strategic importance of high productivity prepares master's degree graduates to advance rapidly in today's business and industries.

Graduate courses are usually offered on the IUPUI evening schedule. The programs are designed to meet the needs of part-time students employed in the Indianapolis area, as well as traditional students who are preparing for careers in research.

For more information, call (317) 278-4960, send e-mail to et_grad@iupui.edu, or see the Web site: www.engr.iupui.edu.

General Requirements

Degree Programs

Contact: Valerie Lim Diemer, Graduate Programs Coordinator

- Master of Science in Biomedical Engineering (M.S.B.M.E.)
- Master of Science in Engineering (M.S.E.)
- Master of Science in Electrical and Computer Engineering (M.S.E.C.E.)
- Master of Science in Mechanical Engineering (M.S.M.E.)
- Master of Science in Technology (M.S. Tech)
- Master of Science in Music Technology (M.S.)
- Master of Science in Music Therapy (M.S.)
- Doctor of Philosophy in Biomedical Engineering (Ph.D.)
- Doctor of Philosophy in Electrical and Computer Engineering (Ph.D.)
- Doctor of Philosophy in Mechanical Engineering (Ph.D.)

*Jointly offered with Purdue University, West Lafayette.

Master of Science in Technology

The School of Engineering and Technology offers graduate education in technology with the primary goal of developing advanced levels of practitioners in industry. The Master of Science in Technology degree program is designed so that graduates holding a B.S. degree in a technology discipline or a related area can complete their degrees as a full-time student or while working full-time. The graduate degree program offers concentration or area of specialization in Applied Information Technology, Construction Engineering Management Technology, Facilities Management (an online program), and Organizational Leadership and Supervision in addition to more interdisciplinary plans of study that draw courses from the various technology programs in the School. The curriculum consists of a total of 33 credit hours, including a directed project, and can be completed in four semesters (two academic years) and must be completed within five years.

For more information, send e-mail to gradengr@iupui.edu or gradtech@iupui.edu. To view the program requirements visit http://engr.iupui.edu/gradprogs/progreq.shtml?menu=req.

Graduate Programs in Biomedical Engineering

Biomedical engineering is an interdisciplinary program and a joint effort of the Purdue School of Engineering and Technology, the Purdue School of Science, and the Indiana University Schools of Medicine and Dentistry at Indiana University–Purdue University at Indianapolis (IUPUI). In addition to these participating academic units, the program operates in close collaboration with several centers and facilities on campus, and with the Department of Biomedical Engineering at Purdue University, West Lafayette.

Students interested in the M.S.B.M.E. degree should apply directly to the Graduate Programs Office of the Purdue School of Engineering and Technology in Indianapolis. Students with a master's degree, or who are solely interested in the Ph.D. degree, should apply to the Department of Biomedical Engineering at West Lafayette, even though they may be resident and study on the Indianapolis campus.

For more information about the M.S.B.M.E visit http://engr.iupui.edu/bme/ms_bme_pos.shtml?menu=ms.

For more information about the PhD program visit https://engineering.purdue.edu/BME/Academics/BMEGraduateProgram/Admissions/.

Graduate Programs in Electrical and Computer Engineering

Students can earn the Master of Science in Electrical and Computer Engineering (M.S.E.C.E.), and the Master of Science in Engineering (M.S.E.), through the Department of Electrical and Computer Engineering at the Purdue School of Engineering and Technology at IUPUI. The M.S.E.C.E. degree is organized into several areas of study, including computer engineering, controls and automation, communication and signal processing, and VLSI and circuit design. The M.S.E. degree is interdisciplinary in nature and is primarily for Bachelor's degree holders in fields other than electrical or computer engineering. Students holding a bachelor's degrees in fields other than electrical or computer engineering may pursue the M.S.E.C.E. if they complete a prescribed list of prerequisite courses.

Qualified students may be authorized to pursue the Ph.D. degree in electrical and computer engineering at IUPUI. Programs leading to the Ph.D. in electrical and computer engineering are jointly administered with the School of Electrical and Computer Engineering at Purdue University, West Lafayette.

For more information about electrical and computer engineering graduate programs visit http://engr.iupui.edu/ece/graduate.shtml?menu=grad.

Graduate Programs in Mechanical Engineering

The Department of Mechanical Engineering has an outstanding and up-to-date engineering faculty with expertise and research interests in the areas of advanced manufacturing, advanced materials, biomechanics, composites, computational fluid dynamics, computer-aided design, computer-aided manufacturing, combustion, controls, fluid mechanics, finite element analysis, fracture, heat transfer, propulsion robotics, solid and structural mechanics, stress analysis, and turbomachinery. The department offers graduate programs of study that lead to the degrees of Master Science (M.S.), Master of Science in Engineering (M.S.E.), Master of Science in Mechanical Engineering (M.S.M.E.), and Ph.D. The program leading to the Ph.D. in mechanical engineering is jointly administered with the School of Mechanical Engineering at Purdue University, West Lafayette.

The department also offers combined bachelor's and master's degree programs, in which students may receive both B.S. and M.S. degrees in five years at IUPUI. These degree programs are open to qualified undergraduates at IUPUI, leading to either: 1) B.S. and M.S.M.E. degrees (B.S./M.S.M.E.) for mechanical engineering undergraduates, or 2) a B.S. degree in physics and an M.S. degree in mechanical engineering (B.P.M.M.E.) for physics undergraduates. The combined degrees prepare students for advanced engineering careers with two degrees (bachelor's and master's) in as little as five years.

For more information about http://engr.iupui.edu/me/bulletin/GraduatePrograms.shtml?menu=academics.

Student Learning Outcomes

The School of Engineering & Technology has organized its Graduate Student Learning Outcomes by program. Please choose the appropriate program in the links below, or the left-hand navigation.

Any questions or concerns about the Student Learning Outcomes should be directed to the Office of Academic Programs in ET 215.

Engineering

- Master of Science in Biomedical Engineering
- Master of Science in Electrical & Computer Engineering
- Master of Science in Mechanical Engineering

Technology

- Master of Science in Technology
- Master of Science in Music Technology*
- Master of Science in Music Therapy*

*Music & Arts Technology students are awarded Indiana University degrees.

Biomedical Engineering

Upon completion of the Master's degree (**with thesis**) in Biomedical Engineering at IUPUI, students will be able to:

1. Assess the quality and relevance of published results from the literature.
2. Apply appropriate laboratory, computational, and analysis techniques in the service of answering a research question or contributing to product development relevant to biomedical engineering.
3. Communicate (in speech, writing, and appropriate supporting visuals) the results and implications of biomedical research.

Upon completion of the Master's degree (**non-thesis**) in Biomedical Engineering at IUPUI, students will be able to:

1. Apply the tools of mathematics, science, and engineering to solve problems at the interface of engineering and biology.
2. Demonstrate knowledge of biological and physiological principles that advance the broad spectrum of life science application areas that is biomedical engineering.
3. Communicate (in speech, writing, and appropriate supporting visuals) information related to the theory and practice of biomedical engineering in research, clinical or industrial settings.

Technology

Upon program completion, students will be able to:

1. Identify, explain, and compare the major quantitative and qualitative approaches in measurement and evaluation within industrial, technological, educational and/or organizational contexts.
2. Use appropriate quantitative and qualitative approaches to measure and evaluate a variety of phenomena in industrial, technological, educational, and organizational settings.
3. Explain, identify, apply and utilize quantitative and qualitative processes to develop and sustain organizational cultures that emphasize quality, productivity, and continuous improvement.
4. Recognize the importance of evidence-based decision-making in industrial, technological, educational, and organizational contexts.
5. Locate and evaluate the credibility and appropriateness of research and applied studies for use in problem-solving in industrial, technological, educational, and organizational contexts.
6. Select and plan an in-depth area of study in industry, technology, education, and/or organizational leadership related to the one's personal, academic, and/or professional objectives.
7. Identify, explain, and apply major theories, concepts, models, and approaches from an in-depth discipline within industry, technology, educational, and/or organizational leadership.
8. Design and implement an appropriate project related to a specifically-identified research or applied problem in an industrial, technological, educational, or organizational context.
9. Conduct a literature review or benchmarking analysis, gather and analyze relevant data, develop sound conclusions and recommendations, and present findings in professionally-presented oral and written reports.

Electrical & Computer Engineering

Graduates of the Masters program in ECE will have the ability to:

1. Apply their knowledge and skills to solve advanced Electrical and Computer Engineering problems.
2. Conduct research in topics within the electrical and computer engineering area.
3. Communicate effectively.

Mechanical Engineering

Upon completion of the Master's degree (**with thesis**) in Mechanical Engineering at IUPUI, students will be able to:

1. Assess the quality and relevance of published results from the literature.
2. Apply appropriate laboratory, computational, and analysis techniques in the service of answering a research question or contributing to product development relevant to mechanical engineering.
3. Communicate (in speech, writing, and appropriate supporting visuals) the results and implications of mechanical engineering research.

Upon completion of the Master's degree (**non-thesis**) in Mechanical Engineering at IUPUI, students will be able to:

1. Apply the tools of mathematics, science, and engineering to solve problems in the broad area of mechanical engineering.
2. Demonstrate knowledge of mechanical engineering principles that advance the broad spectrum of application areas that is mechanical engineering.
3. Communicate (in speech, writing, and appropriate supporting visuals) information related to the theory and practice of mechanical engineering in research or industrial settings.

Music Technology

Upon completion of the program, students will be able to:

GENERAL

1. Investigate the components of music technology.
2. Assess commonly used music software and hardware.
3. Determine best-fit music production models for creative operations.
4. Assess personal skills and knowledge of music production field.
5. Investigate the components of music technology.
6. Explain the basic computing concepts of music sequencing and notation, including the digital electronic process with some analysis of microchips and microprocessors.
7. Describe the function and operational technique of hardware components used in a typical computer music system.
8. Explain the basic computing concepts of music sequencing and notation, including the digital electronic process with some analysis of microchips and microprocessors.
9. Determine project cost analysis for human resources and materials.
10. Develop a theoretical position on ethical use of technology.
11. Discuss the ethical considerations and legal implications of using software.
12. Final Project Example: Develop a new tool, resource, application, artistic production, literary work, or another form of informed expression that utilizes new technologies. Take the project through planning, production and completion stages, and writing pre and post assessments.
13. Identify and evaluate innovative entities in a specific area of music technology.
14. Develop a music program design utilizing storyboard and flowchart modeling.
15. Apply software to create music notation, sound samples, and music graphics.
16. Develop a music program design utilizing storyboard and flowchart modeling.
17. Define Musical Instrument Digital Interface (MIDI) and outline its development.
18. Review major software applications related to music sequencing, timing codes, editing, notation, multimedia, and computer-assisted instruction.
19. Demonstrate conceptual understanding of the multimedia project design process.
20. Demonstrate understanding of psychological concepts that affect multimedia project design.
21. Learn about standard media formats that are used to create media products.
22. Create a CD that employs sound, text, video and or animation.
23. Submit a revised proposal draft for the final project or internship.
24. Develop a multimedia project through the final project proposal. These include determining project parameters, using flowcharts to display project organization, generating subject content, scripting, storyboarding, testing a beta version of the project, and submitting a full proposal.
25. Engage in ownership and responsibility for his or her culminating set of personal, academic, and professional experiences related to the internship.
26. Apply APA style guidelines in citations and written reviews.
27. Complete a report of the final project in APA style.
28. Describe the nature, purposes, and types of research in technology-based arts.
29. Access and use databases, journals, and other sources of research reports and summaries, including library-based medias and online resources.
30. Recognize and interpret the basic language and vocabulary of statistics used in selected research reports.
31. Describe the structure of selected research.
32. Evaluate research in a systematic manner; analyze and review research.
33. Retrieve, critique, and summarize research independently.
34. Develop and review a researchable question in a written proposal.

PERFORMANCE/COMPOSITION/OTHER CREATIVE ACTIVITIES

1. Collaborate in a music production as a team member to produce a music recital.
2. Describe the function and operational technique of hardware components used in a typical computer music system.
3. Enter simple to complex music into a computer utilizing a QWERTY and synthesizer keyboard and a mouse with correct notational aesthetics.
4. Demonstrate, in a musical composition, the use of the synthesizer keyboard programming techniques and controller features (multitimbral channels, sound envelope manipulation, wheel, pedal, and sliders).
5. Use a software application to capture, edit, organize and perform with or otherwise use digital sounds.
6. Delineate the elements of MIDI messages in relation to musical performance or composition (e.g. bits, commands, status and data bytes to pitch, amplitude, velocity; and channel numbers to multitimbral composition).
7. Discuss and give examples of serial and parallel transmission including function of the MIDI connector for MIDI, out and thru.
8. Demonstrate the use of MIDI control surfaces.

PROGRAMMING

1. Program a computer, using MIDI, to orchestrate and playback notated music on a synthesizer.
2. Explain the MIDI specs relating to transmission and reception of messages, and explain the Central Processing Unit.
3. Discuss and give examples of serial and parallel transmission including function of the MIDI connector for MIDI, out and thru.
4. Explain the relationship between various MIDI numbering systems (decimal, binary, octal, and hexadecimal) and some elements of musical expression (pitch, velocity).
5. Recognize and analyze channel voice and mode messages, system commas, real time, and exclusive messages.
6. Review major software applications related to music sequencing, timing codes, editing, notation, multimedia, and computer-assisted instruction.

SCHOLARSHIP

1. Develop a theoretical position on ethical use of technology.
2. Develop a music program design utilizing storyboard and flowchart modeling.
3. Describe the function and operational technique of hardware components used in a typical computer music system.
4. Define Musical Instrument Digital Interface (MIDI) and outline its development.

MUSIC EDUCATION, SCIENCE, THERAPY/, AND HEALTH RELATED STUDIES

1. Identify and evaluate cognitive theories that apply to computer-based training.
2. Test feedback models and human interface designs.
3. Determine project cost analysis for human resources and materials.
4. Describe the function and operational technique of hardware components used in a typical computer music system.
5. Final Project Example: Develop research projects utilizing new technologies for music classroom environments, and prepared final software project model as an educational proposal presentation for a school governing board.
6. Describe the function and operational technique of hardware components used in a typical computer music system.
7. Explain the basic computing concepts of music sequencing and notation, including the digital electronic process with some analysis of microchips and microprocessors.
8. Describe the role of technology as it relates to communication, information competency, creativity, and music education.

BUSINESSS AND MUSIC INDUSTRY

1. Collaborate in a music production as a team member to produce a music recital.
2. Identify and evaluate companies involved in music technology production.
3. Develop a music program design utilizing storyboard and flowchart modeling.
4. Apply software to create music notation, sound samples, and music graphics.
5. Develop a music program design utilizing storyboard and flowchart modeling.
6. Select and apply software tools to project management and timeline projections.
7. Determine project cost analysis for human resources and materials.
8. Present final software project model as a proposal presentation for a client.
9. Describe the function and operational technique of hardware components used in a typical computer music system.
10. Explain the basic computing concepts of music sequencing and notation, including the digital electronic process with some analysis of microchips and microprocessors.
11. Broaden experience and realistic understanding of applied arts technology within a selected industry (or, industries).
12. Synthesize, integrate, and extend their development of applied arts technology skills in the context ofcorporate environments and IT needs.
13. Construct, implement, and evaluate units of work based on appropriate learning experiences which address assigned project outcomes and capstone requirements.
14. Extend their appreciation of the role of music and arts technology within the chosen industry through discussion, reflection and/or demonstration of work projects.
15. Broaden their understanding of the role of project design, evaluation, and reporting in the implementation of arts technology within a given industry through facilitated, mentored, guided, and independent learning experiences.
16. Describe the components of self-marketing and entrepreneurship.

17. Review jobs in the music industry: managers, lawyers, producers, agents, manufacturers, sales, promoters, media and technical.

Music Therapy

Upon program completion, students will be able to:

1. Apply knowledge from music therapy, music medicine, music technology, biological and behavioral sciences to investigate health phenomena.
- Understand history of music therapy research.
- Use criteria to evaluate theories related to individual's focus area.
- Synthesize knowledge from psychometric theories and research as it relates to reliability and validity of measurement instruments.
- Synthesize empirical literature (integrative review) in focus domain such that development of proposal of research builds on background knowledge.
- Define health/or health-related concept as the phenomena of concern for research focus.
- Explain types of knowledge and methods for knowledge generation and philosophy of science underpinnings.
- Synthesize knowledge from minor to apply to focus domain. 1.8 Demonstrate skill in critiquing proposals.
- Describe the nature, purposes, and types of research in technology-based arts.
- Investigate the components of music technology.
- Describe the role of technology as it relates to communication, information competency, creativity, and music education/therapy.
- Identify and evaluate companies involved in music technology production.
- Assess commonly used music software and hardware.
- Identify and evaluate cognitive theories that apply to computer-based training.
- Identify problem in practice that require application of research findings.
- Access and use databases, journals, and other sources of research reports and summaries, including library-based medias and online resources.
- Apply software to create music notation, sound samples, and music graphics.
- Develop a music program design utilizing storyboard and flowchart modeling.
- Ability to synthesize research literature and identify gaps in knowledge.
- Submit an integrative review article in research focus area.
- Demonstrate skills in scientific writing.

2. Utilize analytical and empirical methods to extend music therapy knowledge and scholarship.
- Know research vocabulary.
- Know how to do a literature search.
- Describes research designs and methods for application to research questions.
- Recognize and interpret the basic language and vocabulary of statistics used in selected research reports.
- Understand the process of design and implementation of a research project.
- Review, summarize and critiques journal articles.
- Critically analyzes various forms of analytical and empirical methods to generate knowledge and scholarship in music therapy. Domain: Integration and Application of Knowledge.
- Explore potential application of knowledge utilization in clinical practice.
- Interpret research findings appropriately for application to practice.
- Apply knowledge of descriptive and interferential analytical methods to answer research questions.
- Explore potential application of knowledge utilization in clinical practice.
- Apply skill in quantitative research methodology.
- Apply knowledge of qualitative design and analytical methods.
- Apply knowledge of analytical methods to experimental design.
- Formulate research questions or hypotheses.
- Demonstrate ability to logically link problem identification to research hypothesis and application to practice.
- Demonstrate data management skills.
- Choose data collection methods or instruments consistent with theory and research question.
- Determine best-fit music production models for creative operations.
- Apply APA style guidelines in citations and written reviews.
- Develop and present a convincing written argument that supports the significance of a specified problem.
- Develop and present a convincing written and oral argument that supports the method of choice for thesis.
- Prepare a research proposal that builds on current research and theory.
- Complete a report of the final project in APA style.
- Conduct and communicate research that advances the body of scientific knowledge.
- Prepare a data-based manuscript based on research experiences.

3. Conduct and communicate research that advances the body of scientific knowledge.
- Identify and describe major and changing forces in healthcare and the music therapy profession.
- Broaden their understanding of the role of project design, evaluation, and reporting in the implementation of arts technology within a given industry through facilitated, mentored, guided, and independent learning experiences.
- Conduct and communicates research that advances the body of scientific knowledge.
- Select and apply software tools to project management and timeline projections.
- Test feedback models and human interface designs.
- Determine project cost analysis for human resources and materials.
- Demonstrate oral presentation skills.
- Demonstrate poster presentation skills.

- Develop and present a convincing written argument that supports the significance of a specified problem.
- Prepare a thesis proposal that builds on current research and theory.
- Present final software project model as a proposal presentation for a client.

4. Discuss the ethical considerations and legal implications of using software.
5. Develop a theoretical position on ethical use of technology.
6. Discuss ethical considerations when utilizing human subjects in research.
7. Be aware of support resources available consistent with level of competency expected.
8. Engage in ownership and responsibility for his or her culminating set of personal, academic, and professional experiences.
9. Work effectively as a working member of a research team.

Contact Information

Purdue School of Engineering and Technology

799 West Michigan Street
Indianapolis, IN 46202-5160
Phone: 317.274.2533
Fax: 317.274.4567
etinfo@iupui.edu

Dept. of Biomedical Engineering

723 West Michigan Street, SL 220
Indianapolis, IN 46202-5132
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723 West Michigan Street, SL 160
Indianapolis, IN 46202-5160
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Fax: (317) 274-4493
stucker@iupui.edu(Sherrie Tucker, Sr. Administrative Secretary)

Dept. of Mechanical Engineering

723 West Michigan Street, SL 260
Indianapolis, IN 46202-5132
Phone: 317.274.9717
Fax: 317.274.9744

Dept. of Music and Arts Technology

535 West Michigan Street, IT 352
Indianapolis, IN 46202
Phone: 317.274.4000

Master's Programs

Application Deadlines

Applicants Applying From Within the USA

Fall (August) Admission:

- **January 2** (priority considerations for University Fellowships and assistantships or financial aid)
- **June 1** (final deadline for applications and all supporting documentations)

Spring (January) Admission:

- **November 1** (University Fellowships are not available for admission in this session)

International Applicants Applying From Overseas

Fall (August) Admission:

- **January 2** (priority considerations for University Fellowships and assistantships or financial aid)
- **May 1** (final deadline for applications and all supporting documentations)

Spring (January) Admission:

- **August 31** (University Fellowships are not available for admission in this session)

Domestic Applicants (U.S. citizens or U.S. permanent residents)

The following is a list of items required for your application. Use this checklist to help you in gathering all the necessary documents.

1. Complete the online graduate application and submit a $60 non-refundable application fee (pay online with a valid credit card).
2. A Statement of Purpose located in the online application. Compose a 400-500 word essay detailing your specific area/s of focus in graduate study and summarizing your academic goals and career objectives in relation to your educational background and professional experience, if relevant.
3. Two (2) official sets of final academic transcripts (not photocopied) are required from **all** colleges/universities attended. You may print the Purdue University Graduate School Request for Official Transcript form for use to order your transcripts. Use one form for each institution that you are requesting official transcripts from. Transcripts must be sent directly to our office from the academic institution(s).
4. A certified copy of Bachelor's Degree (diploma) awarded, if degree conferred is not posted on final transcript.
5. Three (3) recommendations for graduate admission are required.*
6. The GRE General Test is required if you are applying for admission to an engineering program (Biomedical Engineering, Electrical and Computer Engineering, or Mechanical Engineering). Official GRE score report from ETS must be sent directly to IUPUI. (Institution code: 1325.) If you are applying for admission to the Technology graduate program, *either* the GRE General Test, the**GMAT**, *or* the **MAT** test is required. Either one of the three tests is acceptable for Technology graduate applicants.

*Persons writing your recommendations should be your present or former professors/instructors and academic advisors, or project leaders, managers/supervisors you report to professionally, and are expected to comment on your academic performance, intellectual abilities, scholastic aptitudes, work ethics. Recommendations from friends, acquaintances, peers, or family members/relatives are **not acceptable.**

Recommenders may complete and submit web-based recommendations within your online application. Instructions are available in the online application on how a recommender may complete and submit an online recommendation; however, if a recommender prefers to complete a paper recommendation form, print the following Purdue University Graduate School recommendation form in pdf format for use: Recommendation for Admission to Graduate School.

Foreign-born Naturalized U.S. Citizens and U.S. Permanent Residents: If you are either a foreign-born naturalized U.S. citizen or a U.S. permanent resident and have completed your Bachelor's (undergraduate) degree or Master's (graduate) degree from a university or college outside the United States of America, official TOEFL test score report from ETS is required for your application. In addition, include with your application two (2) photocopies of your U.S. permanent resident card ("green card") or your U.S. Passport for verification.

Mail all application materials to the following:

Graduate Programs Office

IUPUI - Purdue School of Engineering & Technology

799 West Michigan Street, ET 215
Indianapolis, IN 46202-5160

International Applicants

The following is a list of items required for your application. Use this checklist to help you in gathering all the necessary documents.

1. Complete the online graduate application and submit a $60 non-refundable application fee (pay online with a valid credit card).
2. A Statement of Purpose located in the online application. Compose a 400-500 word essay detailing your specific area/s of focus in graduate study and summarizing your academic goals and career objectives in relation to your educational background and professional experience, if relevant.
3. Two (2) official sets of final academic transcripts (not photocopied) are required from **all** colleges/universities attended. You may print the Purdue University Graduate School Request for Official Transcript form for use to order your transcripts. Use one form for each institution that you are requesting official transcripts from.
4. Two (2) official sets of English translations of final academic transcripts, if official language of home country is not English.
5. Two (2) official copies of undergraduate (Bachelor's) degree diploma received in official language of home country.
6. Two (2) official English translations of undergraduate (Bachelor's) degree diploma received, if official language of home country is not English.
7. Three (3) recommendations for graduate admission are required.*
8. The GRE General Test is required if you are applying for admission to an engineering program. Official GRE score report from ETS must be sent directly to IUPUI. (Institution code: 1325.)
9. Official TOEFL score report to be sent from testing agency (ETS) directly to IUPUI. Institution code: 1325
10. Form " Financial Information for International Students " to be completed by you and your sponsor.
11. Official letter or statement from a bank verifying that your sponsor has required funds to pay total expenses/cost for at least two years. Submit a recent, original bank letter or bank statement. Original only. Photocopies or fax copies are not acceptable.
12. If you have a government or institutional scholarship: Provide an official letter from the sponsoring agency that specifies the amount of the award or scholarship.
13. A photocopy of your current visa and/or I-20 documents, if you are already in the U.S.A.

*Persons writing your recommendations should be your present or former professors/instructors and academic advisors, or project leaders, managers/supervisors you report to professionally, and are expected to comment on your academic performance, intellectual abilities, scholastic aptitudes, work ethics. Recommendations from friends, acquaintances, peers, or family members/relatives are **not acceptable.**

Recommenders may complete and submit web-based recommendations within your online application. Instructions are available in the online application on how a recommender may complete and submit an online recommendation; however, if a recommender prefers to complete a paper recommendation form, print the following Purdue University Graduate School recommendation form in pdf format for use: Recommendation for Admission to Graduate School.

Mail all application materials to the following:

Graduate Programs Office

IUPUI - Purdue School of Engineering & Technology

799 West Michigan Street, ET 215
Indianapolis, IN 46202-5160

MS in Music Technology

The Master of Science in Music Technology (MSMT) curriculum provides post-baccalaureate education in areas of computer-based music technology, multimedia and interactive design and multimedia production techniques. The primary objective of the program is to bring new and emerging digital arts technologies to students as they relate to a new discipline defined as music technology. The curriculum establishes the creative application of multimedia technology to video, audio and graphic production of arts and educational materials. Included in this field are foundations, methods and theoretical courses which underpin the development of production skills required in using technology in a creative environment.

Application Requirements

- Submission of the online application to the University
- Submission of the Department of Music and Arts Technology application
- Bachelor's degree and evidence of substantial music instruction, performance and literacy
- All official transcripts of undergraduate and graduate study

- Minimum Grade Point Average of 3.0 (on a 4.0 scale) for the undergraduate degree
- Performance videotape, audio cassette, CD, DVD or on-campus audition on a musical instrument or conducting of a music ensemble
- Three letters of recommendation in support of the application (they may be on business letterhead, submitted through the online application link, or from the recommendation forms included in the Department of Music and Arts Technology application packet)
- Any additional information that demonstrates personal experience in music technology and musicianship (e.g., authored CDs or websites, original compositions)
- In-person or telephone interview with the Head of Graduate Studies
- $50 application fee ($60 for an International applicant), payable through the online application.

Please note: The GRE is NOT required for application to the MSMT program.
International applicants from other than English speaking countries must take the TOEFL.

Degree Requirements

30 credit hours* for degree, including:

- 18 credit hours in Core courses (at the 500 level or above);
- 6 credit hours in Cognate courses (at the 400 level) to be selected from Music, Business, Education, Communications, Computer Science, Fine Arts or Law;
- 6 hours of approved electives (at the 400 level or above) from the cognate field or other fields with approval of the head of the graduate studies.

Minimum grade point average:

- 3.0 average to continue;
- No grades lower than "B" in core courses and cognate fields will be counted toward the degree
- No grades lower than "C" will be counted toward the degree;
- Residency requirement (on-campus student only), 3 consecutive summers or 1 summer and a contiguous academic term.

Current Tuition Rates (Fall 2012 - Summer 2013)

Indiana Resident: $352.10 per credit hour
Non-Resident (out-of-state, international) $1007.00 per credit hour.

Download Information Guide

Click to download the Information Guide .
You might need to install Adobe Acrobat Reader to open the file.

Apply Now

You need to complete **both** the Department Application and the University online application.

MS in Music Therapy

The Master of Science in Music Therapy program is designed to provide professional board-certified music therapists (http://www.cbmt.org) with advanced research skills and clinical practice in music therapy, and to teach music therapists how to utilize the array of tools available in music technology for such purposes. Within music therapy clinical practice and research, music technology will: 1) facilitate the collection and analysis of data generated during clinical sessions; 2) apply compositional and improvisational techniques with patients, and; 3) exploit the multi-mediated environment of the MIDI workstation where visual, auditory, and tactile senses can work interchangeably to support therapeutic strategies.

Application Requirements

- Submission of the online application to the University
- Submission of the Department of Music and Arts Technology application
- Bachelor's degree and evidence of substantial music instruction, performance and literacy
- All official transcripts of undergraduate and graduate study
- Minimum Grade Point Average of 3.0 (on a 4.0 scale) for the undergraduate degree
- Performance videotape, audio cassette, CD, DVD or on-campus audition on a musical instrument or conducting of a music ensemble
- Three letters of recommendation in support of the application (they may be on business letterhead, submitted through the online application link, or from the recommendation forms included in the Department of Music and Arts Technology application packet)
- Any additional information that demonstrates personal experience in music technology and musicianship (e.g., authored CDs or websites, original compositions)
- In-person or telephone interview with the Head of Graduate Studies
- $50 application fee ($60 for an International applicant), payable through the online application.

Degree Requirements

30 credit hours* for degree, including:

- 18 credit hours in Core courses (at the 500 level or above);
- 6 credit hours in Cognate courses (at the 400 level) to be selected from Music, Business, Education, Communications, Computer Science, Fine Arts or Law;
- 6 hours of approved electives (at the 400 level or above) from the cognate field or other fields with approval of the head of the graduate studies.

Minimum grade point average:

- 3.0 average to continue;
- No grades lower than "B" in core courses and cognate fields will be counted toward the degree
- No grades lower than "C" will be counted toward the degree;
- Residency requirement (on-campus student only), 3 consecutive summers or 1 summer and a contiguous academic term.

Current Tuition Rates (Fall 2012- Summer 2013)

Indiana Resident: $352.10 per credit 1007.00 per credit hour.

Download Information Guide

Click to download the Information Guide .
You might need to install Adobe Acrobat Reader to open the file.

Apply Now

You need to complete **both** the Department application and the University online application.

MS in Technology (Facilities Management)

If you are currently working in the field of facility management (or have an interest in this career field) as a planner, property manager, plant manager, facility manager, plant engineer or other related areas you can enhance job opportunities while earning a formal credential sitting at your computer. This online program is designed for working professionals and can be completed in ONLY 2 years. You will share a virtual classroom with facility management professionals from around the world while earning a Purdue University degree. This is a unique program that will increase your knowledge and professionalism and therefore, your value as a facilities manager.

Description: The M.S. Degree in Technology, Facilities Management Emphasis is an on-line graduate program designed for the working student. The program provides an integrated experience in facilities management with emphasis on project and contract management, engineering systems management and energy management. The program also requires an independent direct project in the area of facilities management.

You may apply for admission to the program, if you:

- Have completed or will be completing a bachelor's degree from an accredited university.
- Coursework or knowledge of trigonometry and statistics.
- Obtained an undergraduate cumulative GPA of 3.0 or higher on a 4.0 scale.
- Have taken the GRE (Graduate Record Examination). General test and obtained scores above the 50th percentile for unconditional admission, or obtained scores above the 30th percentile for conditional admission.

Information about admissions and the GRE can be obtained from:
Office of Graduate Programs
Purdue School of Engineering and Technology
723 West Michigan Street, SL 164
Indianapolis, IN 46202
Telephone: 317/278-4960
Email: gradtech@iupui.edu
International students who are graduates of non-US institutions and whose first language is not English are required to take the Test of English as a Foreign Language (TOEFL). A minimum score of 550 on the paper version or 213 on the computer version is required.

Apply Now

Visit http://www.engr.iupui.edu/gradprogs/application.shtml to apply for admission to the **Masters in Technology** degree program. If you are a US Citizen, please select the domestic student application form. International students should download the Instruction sheet for application and review the required checklist.

MS in Technology

You are eligible to apply for admission to the program, if you:

- Have completed or will be completing a bachelor's degree from an accredited technology, engineering, or a related discipline.
- Obtained an undergraduate GPA (grade point average) of 3.0 or higher on a 4.0 scale, or overall "B" average equivalent.
- Have taken either GMAT, GRE, or MAT (Miller's Analogies Test) test.
- And for international applicant: Have taken the TOEFL test and met the minimum scores requirement.

PhD in Biomedical Engineering

While no single factor or score can characterize an applicant's probability for success, the following benchmarks may prove helpful.

Successful U.S. applicants typically have average undergraduate GPAs of approximately 3.60 (Prior graduate school GPAs, if applicable, are higher).

In the case of international students, successful applicants are typically in the top 5% of their graduating class, or higher, depending on the prior institution. Target GRE scores are 550 and higher for verbal and 750 and higher for quantitative.

Application Requirements

In order to be considered for admission to the Biomedical Engineering Graduate Program, the following forms are required to be completed by all applicants:

1. Complete the electronic application (Paper applications have been phased out).
2. Submit an non-refundable application ($60 for us citizens and permanent residents and $75 for international applicants).
3. Submit an online statement of approximately 300-500 words concerning your purpose for undertaking or continuing graduate study, your reasons for wanting to study at Purdue, and your professional plans, career goals, and research interests. You also may explain any irregularities or special circumstances applicable to your background and elaborate on your special abilities, awards, achievements, scholarly publications, and/or professional history.
4. Three (3) letters of recommendation are required for degree seeking applicants. The people submitting recommendation letters on your behalf may send their recommendations to Purdue University through the online recommendation system (preferred) or via paper. For recommenders wishing to complete a paper recommendation, please send the Graduate School recommendation form (PDF and Word).
5. Two official transcripts from each college or university you have attended must be submitted.*
6. Official TOEFL Score reported electronically by ETS, or Official IELTS Score reported to the Purdue University Graduate School. International degree-seeking applicants whose native language is not English are required to submit the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) scores for Purdue University Graduate School admission. Your

application is not complete until your TOEFL scores are received directly from ETS or your IELTS Scores are received from the Purdue University Graduate School. **

*NOTE: If colleges or universities attended do not provide transcripts in English, then official, original (native) language transcripts must be accompanied by certified English translations. An official transcript bears the original signature of the registrar and/or the original seal of the issuing institution. For completed degrees, if your transcript does not clearly indicate the date and from where the degree was obtained, you must also include a *copy* of the original degree certificate. This most often pertains to transcripts sent from universities in China and India, where degree certification is usually not indicated on the transcript. As with transcripts, if foreign institutions do not provide the degree certificate in English, then a copy of the original (native) language degree certificate must be accompanied by a copy of certified English translation. Transcripts cannot be returned. Transcripts should be mailed directly to the Weldon School.

**NOTE: Official TOEFL Score reported electronically by ETS to the Purdue University Graduate School. International non-native speakers of English must achieve a TOEFL score of 550 or higher on the paper-based examination or 213 or higher on the computer-based examination to be considered for admission to a degree program. These scores will only be accepted for up to two years after the date they were taken. For the new Internet-based Test of English as a Foreign Language (TOEFL iBT), non-English speaking applicants are required to have a minimum score in each of the four test areas as follows: Writing 18, Speaking 18, Listening 14, and Reading 19. An overall minimum score of 77 will be required. Purdue University's code for the TOEFL is 1631.

Official IELTS Score reported by IELTS International to the Purdue University Graduate School. International applicants must achieve a minimum score of 6.5 or higher to be considered for admission into the Weldon School of Biomedical Engineering. Have scores sent to the Graduate School at Purdue University.

You can check the status of your application online at the Graduate School Application website or inquiries can be sent to WeldonBMEGrad@purdue.edu. All records submitted by and on behalf of an applicant become the property of Purdue University and cannot be returned.

Application Deadlines

The deadline for receipt of a completed application (online application submitted, fee paid, and all required official documents received in the Weldon School) for priority consideration of admission and financial support is **December 15**.

Please note that **our program has NO spring or summer admissions**.

Our Graduate office will answer any questions that you may have. Please contact us at:

Biomedical Engineering Graduate Office
Purdue University
206 S. Martin Jischke Drive
West Lafayette, IN 47907-2032
Phone: 765-494-2982
Fax: 765-494-1193
Email: WeldonBMEGrad@purdue.edu

PhD in Electrical & Computer Engineering

To apply for admission to the Ph.D. program in Electrical and Computer Engineering, you must follow these specific steps and instructions to apply:

1. Complete the Purdue University online application and select *West Lafayette campus*.
2. Submit a Statement of Purpose (300-500 words) and Resume. Send hardcopies if you are unable to submit the your application.*
3. Send two (2) copies of official transcripts from the Registrar in a sealed envelope. Transcript/Class Rank Form
4. Send official GRE Test scores for ETS only (no photocopies).
5. For degree-seeking whose native language is not English, submit official TOEFL scores from ETS only, no photocopies. We also accept IELTS scores in place of TOEFL – please send the official score sheet.
6. Submit three (3) letters of recommendation.
7. In the supplemental ***ECE Web Application*** form where it asks for "Campus Preference", state as your campus preference.
8. Notify the Coordinator of Graduate Engineering and Technology Programs at IUPUI by email wvlim@iupui.edu after you have submitted the Purdue University application and have sent all application materials to the ECE Graduate Office at Purdue University.

*In your **Statement of Purpose** you must state clearly that you wish to be admitted to the Ph.D. program to study at the_. You should also specify in the Statement the research area/s you are interested in and the you wish to study with.

Go to the Purdue University ECE website to begin the application process.

NOTE: To inquire about your application status send email directly to the Admissions Representative in the ECE Graduate Office at Purdue University, West Lafayette: ecegrad@purdue.edu.

Bachelor's level students are normally considered for admission into the Master's program; however, bachelor's level students with exceptionally strong undergraduate records may apply for and be considered for direct admission into the Ph.D. degree program.

Doctoral Program Basic Requirements

- *Undergraduate Cumulative Grade Point Average:* 3.25 or equivalent required
- *Master's Degree Completion:* Required, with a grade point average of 3.3 or equivalent, or superior performance in a bachelor's program
- *Graduate Record Examination (GRE):* Required -- no minimum score set

International Applicant Requirements

- *TOEFL for Non-Native English Speakers:* Minimum Paper-Based Test (PBT) Score Required: 550

Minimum Internet-Based Test (IBT) Overall Score Required: 77
With the following minimum section requirements:
Reading: 19
Listening: 14
Speaking: 18
Writing: 18

- *IELTS (Academic Module):*
  An alternative to the TOEFL, scores of 6.5 or higher will be accepted
- *Pearson Test of English (PTE) (Academic Module):*
  An alternative to the TOEFL, scores of 58 or higher will be accepted
- *TWE for Non-Native English Speakers*
  Not required, but recommended
- *Or New IELTS*

Application Deadlines

Fall Admission:

- **January 5** (for completed applications for priority consideration for financial support)
- **May 1** (final deadline)

Spring Admission:

- **September 15** (for completed applications)

Summer Admission:

- Summer session is only available to applicants admitted for fall who wish to start research early through an agreement with their professor.

Contact Information

Name: Karen Jurss
Admissions Representative
Phone: (765) 494-3392
E-mail: ecegrad@ecn.purdue.edu

In order to expedite the processing of your application, we ask that you submit all supporting documents in ***one large envelope***.

Mail all required application materials directly to:

Graduate Office
School of Electrical and Computer Engineering
Purdue University
465 Northwestern Avenue
West Lafayette, IN 47907-2035
USA

PhD in Mechanical Engineering

Application Deadlines

Domestic Applicants (U.S. citizens and U.S. permanent residents)

The following is a list of items required for your application. Use this checklist to help you in gathering all the necessary documents.

1. Complete the online graduate application and submit a $50 application fee (pay online with a valid credit card).
2. A Statement of Purpose located in the online application. A 400-500 word essay detailing your specific area/s of focus in graduate study and summarizing your academic goals and career objectives in relation to your educational background and professional experience, if relevant.
3. Two (2) official sets of final academic transcripts (not photocopied) are required from **all** colleges/universities attended. You may print the Purdue University Graduate School Request for Official Transcript form for use to order your transcripts. Use one form for each institution that you are requesting official transcripts from. Transcripts must be sent directly to our office from the academic institution/s.
4. Certified copy of Bachelor's Degree (diploma) awarded, if degree conferred is not posted on final transcript.
5. Certified copy of Master's Degree (diploma) awarded, if degree conferred is not posted on final transcript.
6. Three (3) recommendations for graduate admission are required.*
7. Complete the program department application (for Mechanical Engineering only).
8. The GRE General Test is required if you are applying for admission to an engineering program. Official GRE score report from ETS needs to be sent directly to IUPUI. Institution code: 1325.

Foreign-born Naturalized U.S. Citizens and U.S. Permanent Residents: If you are either a foreign-born naturalized U.S. citizen or a U.S. permanent resident and have completed your Bachelor's (undergraduate) degree or Master's (graduate) degree from a university or college outside the United States of America, the official TOEFL test score report from ETS is required for your application. In addition, include with your application two (2) photocopies of your U.S. permanent resident card ("green card") or your U.S. Passport for verification.

*Persons writing your recommendations should be your present or former professors/instructors, advisors, project leaders, or managers/supervisors who you report to professionally, and are expected to comment on your academic performance, intellectual abilities, and scholastic aptitudes. Recommendations from friends, acquaintances, peers, or family members/relatives are **not acceptable**.

Recommenders may complete and submit web-based recommendations within your online application. Instructions are available in the online application on how a recommender may complete and submit an online recommendation; however, if a recommender prefers to complete a paper recommendation form, print the following Purdue University Graduate School recommendation form in pdf format for use: Recommendation for Admission to Graduate School.

Mail all application materials to the following:

Graduate Programs Office

IUPUI - Purdue School of Engineering & Technology

799 West Michigan Street, ET 215
Indianapolis, IN 46202-5160

International Applicants

The following is a list of items required for your application. Use this checklist to help you in gathering all the necessary documents.

1. Complete the online graduate application and submit a $60 application fee (pay online with a valid credit card).
2. A Statement of Purpose located in the online application. A 400-500 word essay detailing your specific area/s of focus in graduate study and summarizing your academic goals and career objectives in relation to your educational background and professional experience, if relevant.
3. Two (2) official sets of final academic transcripts (not photocopied) are required from **all** colleges/universities attended (Do not include secondary or high school transcripts). You may print the Purdue University Graduate School Request for Official Transcript form for use to order your transcripts. Use one form for each institution that you are requesting official transcripts from. Transcripts must be sent directly to our office from the academic institution/s.
4. Two (2) official sets of English translations of final academic transcripts, if official language of home country is not English.
5. Two (2) official copies of undergraduate (Bachelor's) and graduate (Master's) degree diplomas received in official language of home country.
6. Two (2) official English translations of undergraduate (Bachelor's) and graduate (Master's) degree diplomas received, if official language of home country is not English.
7. Three (3) recommendations for graduate admission are required.*
8. Complete the program department application (for Mechanical Engineering only).
9. The GRE General Test is required if you are applying for admission to an engineering program. Official GRE score report from ETS needs to be sent directly to IUPUI. Institution code: 1325.
10. Official TOEFL score report to be sent from testing agency (ETS) directly to IUPUI. Institution code: 1325
11. Form " Financial Information for International Students " to be completed by you and your sponsor.
12. Official letter or statement from a bank verifying that your sponsor has required funds to pay total expenses/cost for at least two years. Submit a recent, original bank letter or bank statement. Original only. Photocopies or fax copies are not acceptable.
13. If you have a government or institutional scholarship: Provide an official letter from the sponsoring agency that specifies the amount of the award or scholarship.
14. A photocopy of your current visa and/or I-20 documents, if you are already in the U.S.A.
15. Letter of financial support from your research advisor or major professor. Note: This letter of support will only be prepared and provided AFTER your application has been reviewed for admission AND a professor has indicated his/her interest in providing full financial support for your Ph.D. education.

*Persons writing your recommendations should be your present or former professors/instructors, advisors, project leaders, or managers/supervisors who you report to professionally, and are expected to comment on your academic performance, intellectual abilities, and scholastic aptitudes. Recommendations from friends, acquaintances, peers, or family members/relatives are **not acceptable**.

Recommenders may complete and submit web-based recommendations within your online application. Instructions are available in the online application on how a recommender may complete and submit an online recommendation; however, if a recommender prefers to complete a paper recommendation form, print the following Purdue University Graduate School recommendation form in pdf format for use: Recommendation for Admission to Graduate School.

Mail all application materials to the following:

Graduate Programs Office

IUPUI - Purdue School of Engineering & Technology

799 West Michigan Street, ET 215
Indianapolis, IN 46202-5160

Admissions

- Master's Programs
- MS in Music Technology
- MS in Music Therapy
- MS in Technology
- MS in Technology-Facilities Management Online
- PhD in Biomedical Engineering
- PhD in Electrical and Computer Engineering
- PhD in Mechanical Engineering

Departments & Centers

Departments

Engineering

- Department of Biomedical Engineering BS,MS (BME)
- Doctor of Philosophy in Biomedical Engineering (Ph.D.)

- Department of Electrical and Computer Engineering (ECE)
- Computer Engineering BS (CmpE)
- Electrical Engineering BS (EE)
- Electrical & Computer Engineering MS (ECE)
- Doctor of Philosophy in Electrical and Computer Engineering (Ph.D.)

- Department of Mechanical Engineering (ME)
- Energy Engineering BS (EEN)
- Mechanical Engineering BS (ME)
- Mechanical Engineering MS (ME)
- Doctor of Philosophy in Mechanical Engineering (Ph.D.)

Technology

- Department of Computer, Information, & Graphics Technology (CIGT)
- Computer & Information Technology BS (CIT)
- Computer Graphics Technology BS (CGT)

- Department of Technology Leadership & Communication (TLC)
- Organizational Leadersip & Supervision BS (OLS)

- Technical Communication (TCM)

- Department of Engineering Technology (ENT)
- Architectural Technology AS (ART) (Discontinued as of Summer 2013)
- Biomedical Engineering Technology AS, BS (BMET)
- Construction Engineering Management Technology BS (CEMT)
- Computer Engineering Technology BS (CpET)
- Electrical Engineering Technology BS (EET)
- Interior Design Technology AS, BS (INTR)
- Mechanical Engineering Technology BS (MET)
- Motorsports Engineering BS (MSTE)
- Quality Assurance Certificate Program

- Department of Music & Arts Technology (MAT)*
- Music Therapy MS (MSMTh)
- Music Technology MS (MSMT)
- Music Technology BS (BSMT)

Centers
New Student Academic Advising Center (NSAAC)

New Student Academic Advising Center (NSAAC)

Director: D. King
Assistant Professor of Engineering, Part-time and Academic Advisor: N. Lamm Senior Lecturer of Freshman Engineering: P. Orono Lecturer of Freshman Engineering: P. Gee

The New Student Academic Advising Center for the School of Engineering and Technology was formed in 2007. The center is the advising unit for all students new to the School of Engineering and Technology, including beginners, transfers, second degree, and returning students. The center provides services that include orientation programs, transfer credit analysis, and academic advising through the first year of student's enrollment. In addition to providing academic advising, the center coordinates the curriculum and teaching for the freshman engineering courses as well as the learning community courses required for all beginning students.

All qualified students interested in pursuing an engineering degree at IUPUI are admitted to the Freshman Engineering Program. This includes second-degree and transfer students as well as beginning students. While in this program, beginning students complete the basic sequence of courses common to all engineering majors. These courses include calculus I and II, chemistry and physics for science and engineering majors, English composition, and public speaking. Freshman engineering courses include: ENGR 19500 Introduction to the Engineering Profession, ENGR 19600 Introduction to Engineering, ENGR 19700 Introduction to Programming Concepts, and ENGR 29700 Computer Tools for Engineering. The Freshman Engineering Program provides students with an opportunity to explore the various engineering disciplines before making a commitment to a specific curriculum.

Biomedical Engineering (BME)

Chancellor's Professor: E. Berbari *(Chair)* **Professors:** G. Kassab, H. Yokota
Associate Professors: J. Schild, D. Xie, K. Yoshida
Assistant Professors: J. Ji, S. Na, C.C. Lin, J. Wallace
Clinical Associate Professor: W. Combs
Lecturer: K. Alfrey *(Director of the Undergraduate Program)*

Biomedical engineering is a discipline that advances knowledge in engineering, biology, and medicine to improve human health through cross-disciplinary activities that integrate the engineering sciences with the biomedical sciences and clinical practice. Students work in the development of new devices, algorithms, processes, and systems that advance biology and medicine and improve medical practice and health care delivery. Many students choose BME because it is people-oriented.

The mission of the Biomedical Engineering Department is to strive to attain world-class research and to provide the highest quality educational experience for our students. We expect and value excellence in conducting research, and training students to participate in research activities and professional practice. We accomplish our Mission as follows:

- **By exploiting the most modern and innovative approaches, we are leaders in interdisciplinary biomedical engineering research and discovery.**
- **By providing students with an education in engineering principles, design, and modern biomedical science, we develop in them the knowledge and skills for productive careers in biomedical engineering.**
- **By committing to service to advance biomedical engineering, we contribute to the field.**

Bachelor of Science in Biomedical Engineering

The bachelor's degree in Biomedical Engineering (B.S.B.M.E.) integrates the engineering analysis and design skills of the Purdue School of Engineering and Technology with the life sciences offered through the Purdue School of Science and with significant medical/clinical elements available through collaboration with the Indiana University School of Medicine.

The B.S.B.M.E. degree program combines a strong set of mathematics, science, and biomedical engineering courses into a demanding and rewarding four-year degree program aimed at solving contemporary problems in the life and health sciences. Outstanding features include instructional objectives that integrate the study of the fundamental principles of life and health sciences with rigorous engineering disciplines through a core of interdisciplinary courses that include biomechanics, biomeasurements, biomaterials, computational biology, and biosignals and systems analysis, among others. Many of the courses involve laboratory and problem solving recitation sections that lead the student through a practical encounter with methods of engineering analysis aimed at understanding and solving problems related to human health care and delivery. The Senior Design Experience is a two-semester sequence where a team approach is used to solve problems originating from the laboratories of faculty across the Schools of Engineering, Science, Dentistry, and Medicine, as well as from clinical and industrial partners. This approach will develop strong team-working skills among the students and enhance

their communication skills with professionals outside of their discipline.

The senior year electives enable the student to pursue course content that develops a depth of understanding in a number of biomedical engineering expertise areas such as tissue engineering, biomolecular engineering, imaging, bioelectric phenomena, biomechanics, and regenerative biology. Students interested in pursuing careers in medicine or dentistry may also use their electives to fulfill these respective preprofessional requirements. Highly motivated students with strong academic credentials will find biomedical engineering an excellent premedical or predental degree program.

This exciting and innovative curriculum forms the basis of our program vision, whereby our students will be well educated in modern biomedical engineering, and with this knowledge they will be prepared to develop new devices, technologies, and methodologies that lead to significant improvements in human health care and delivery. The Biomedical Engineering Web site (www.engr.iupui.edu/bme/) has the most up-to-date information concerning the plan of study for the B.S.B.M.E. degree program.

Biomedical Engineering Program Objectives

The program educational objectives of our biomedical engineering undergraduate program are to integrate engineering and life science principles into a comprehensive curriculum that produces graduates who can achieve the following career and professional accomplishments, if desired:

- **Meet employer expectations in medical device companies or other health or life science related industries.**
- **Pursue and complete advanced graduate degrees in biomedical engineering, or related engineering or life science areas.**
- **Pursue and complete advanced professional degree programs in medicine, law, business, or other professional areas.**

The above program objectives are based on achieving a set of assessable program outcomes at the time the students have completed the undergraduate curriculum and are outlined below:

Program Outcomes

Upon completing the undergraduate BME degree, our students will possess:

a. an ability to apply knowledge of mathematics, science, and engineering

b. an ability to design and conduct experiments, as well as to analyze and interpret data

c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d. an ability to function on multi-disciplinary teams

e. an ability to identify, formulate, and solve engineering problems.

f. an understanding of professional and ethical responsibility

g. an ability to communicate effectively

h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i. a recognition of the need for, and an ability to engage in life-long learning

j. a knowledge of contemporary issues

k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

l. an understanding of biology and physiology

m. the capacity to apply advanced mathematics (including differential equations and statistics), science and engineering to solve problems at the interface of engineering and biology

n. the ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and non-living materials and systems

Transfer Students

Transfer students are initially admitted to the Freshman Engineering Program. Subsequent transfer into the Department of Biomedical Engineering is permitted only after consultation with a Biomedical Engineering Advisor to ensure course equivalencies and to evaluate the student's overall academic achievement. Students requesting transfer into Biomedical Engineering must submit a brief application.

Admission into Biomedical Engineering

Freshman engineering students who declare a biomedical engineering major must apply to the Department of Biomedical Engineering for formal admission by April 1 of their first year. Acceptance into the department is competitive and is based on academic qualifications, advisor's recommendation, and available space.

Graduate Programs in Biomedical Engineering

Biomedical engineering is an interdisciplinary program and a joint effort of the Purdue School of Engineering and Technology, the Purdue School of Science, and the Indiana University Schools of Medicine and Dentistry at Indiana University-Purdue University Indianapolis (IUPUI). In addition to these participating academic units, the program operates in close collaboration with several centers and facilities on campus, and with the Department of Biomedical Engineering at Purdue University, West Lafayette.

Students interested in the M.S.B.M.E. degree should apply directly to the Graduate Programs Office of the Purdue School of Engineering and Technology in Indianapolis. Students with a master's degree, or who are solely interested in the Ph.D. degree, should apply to the Department of Biomedical Engineering at West Lafayette, even though they may be resident and study on the Indianapolis campus.

For more information about the M.S.B.M.E. visit http://engr.iupui.edu/bme/ms_bme_pos.shtml?menu=ms.

For more information about the Ph.D. program visit https://engineering.purdue.edu/BME/Academics/BMEGraduateProgram/Admissions/.

Plan of Study

Bachelor of Science Plan of Study

Guidelines for selecting General Education Electives, as well as a list of approved courses, can be found on the BME website (http://www.engr.iupui.edu/bme/). BME, science, and technical electives must be selected in consultation with an academic advisor. These courses may include upper-level science, BME, or other engineering courses not already included on the BME plan of study. The goal of these electives is to provide depth of education in a specific sub-discipline of Biomedical Engineering.

Freshman Year	**Credit Hours**
First Semester	
BIOL-K 101 Concepts of Biology I	5
ENGR 19500 Engineering Seminar	1
ENGR 19600 Engineering Problem Solving	3
MATH 16500 Integrated Calculus and Analytic Geometry	4
ENG W 131 Elementary Composition I	3
ENGR 19700 Intro to Computing (C Programming)	2
TOTAL	18
Second Semester	
CHEM-C 10500 Principles of Chemistry I	3
CHEM 12500 Experimental Chemistry I	2
PHYS 15200 Mechanics	4
MATH 16600 Integrated Calculus and Analytic Geometry II	4
MATH 17100 Multidimensional Mathematics	3
ENGR 29700 Intro to Computing (MATLAB)	1
TOTAL	17
Sophomore Year	
First Semester	
MATH 26100 Multivariate Calculus	4
PHYS 25100 Elec., Heat, Optics	5
BME 22200 Biomeasurements	4
CHEM-C 106 Principles of Chemistry II	3
TOTAL	16
Second Semester	
MATH 26200 Linear Algebra Differential Eqns.	3
BIOL K32400 Cell Biology	3
BIOL K32500 Cell Biology Lab	2
BME 24100 Intro. Biomechanics	4
Comm. R110 Fund of Speech Communication	3
General Education Elective	3
TOTAL	18
Junior Year	
First Semester	
CHEM-C 34100 Organic Chemistry I	3
CHEM-C 34300 Organic Chemistry Lab I	2
BME 38100 Implantable Materials & Biological Response	3
BME 38300 Problems in Implantable Materials & Biological Response	1
BME 33100 Biosignals and Systems	3
BME 33400 Biomedical Computing	3
General Education Elective	3
TOTAL	18
Second Semester	
BME 32200 Probability & Statistics for BME	3
BME 35200 Tissue Behavior and Properties	3
BME 35400 Problems in Tissue Behavior and Properties	1
BME Gateway Elective*	3
General Education Elective	3

BME 40200 BME Seminar	1
TCM 36000 Communications in Engineering Practice	2
TOTAL	16

Senior Year

First Semester

BME 49100 Biomedical Engineering Design I	3
BME 41100 Quantitative Physiology	3
BME 44200 Biofluid and Biosolid Mechanics	3
BME/SCI/TECH Elective*	3
BME/SCI/Tech Elective	3
TOTAL	15

Second Semester

BME 49200 Biomedical Engineering Design II	3
BME 46100 Transport Processes in BME	3
BME/Tech Elective	3
BME 40400 Ethics for Biomedical Engineers	1
General Education Elective	3
TOTAL	13

*The four BME/SCI/Tech electives must be selected in consultation with an advisor to form an appropriate Depth Area.

Computer, Information, & Graphics Technology (CIGT)

Chair: Eugenia Fernandez, Associate Professor of Computer & Information Technology
Associate Chair: Dan Baldwin, Director and Assistant Clinical Professor of Computer Graphics Technology

The Department of Compute, Information and Graphics Technology houses degree and certificate programs in Computer and Information Technology (CIT), Computer Graphics Technology (CGT), anda Master of Science in Technology.

Our department partners two dynamic programs, bringing together talented faculty and staff who continue to develop innovative and creative opportunities for teaching and learning both on and off campus. CIT's Living Lab programs all serve as powerful tool for experiential learning for our students, and are exemplars of IUPUI's RISE to the Challenge Initiative.

Both CGT and CIT degree programs are accredited by ABET Inc. (Accreditation Board for Engineering and Technology), a process involving voluntary review to ensure the program meets established quality standards. By participating in ABET accreditation, we focus on continuous quality improvement, a hallmark of all successful organizations.

As a CIGT student, graduate, or industrial partner, you are an integral part of tomorrow's technology community. Technical skills and professional leadership competencies continue to make our graduates distinctive, unique, and highly marketable in meeting the needs of employers today. All industries seek strong, effective, and mature leaders with the technological knowledge to compete in a global workforce. CIGT programs will be the resource of choice to meet that need and each of you will benefit from the synergy created in our department.

Computer & Information Technology

Professors: A. Jafari **Associate Professors:** E. Fernandez (*Chair*), J. Starks, H. Wu
Assistant Professor: F. Li
Clinical Assistant Professor: C. Justice **Lecturers:** S. Catlin, J. Clark, R. Elliott, N. Evans, C. Minns

The Computer and Information Technology (CIT) program offers a Purdue Bachelor of Science Degree. This degree is available with four concentrations: Web Development, Data Management, Networking Systems, and Information Security These concentrations are designed to provide an applications-oriented, practical education that prepares students for careers as application developers (people who design, write, install and maintain a variety of IT systems, with an emphasis on Web applications); data managers (people who, design, implement, program and maintain databases); network systems specialists (people who to design, configure, secure and maintain IT networks); and information security specialists (people who protect information assets of an organization).

Students who must interrupt their course of study for two calendar years or more will be required to meet all requirements for the program as it stands at the time of their return. Computer and Information Technology (CIT) courses over 10 years old may have to be repeated. Students should check with a CIT advisor.

CIT has been a leader in offering degree courses that can be completed via distance education. Selected courses may be taken either partially or completely via the Web.

CIT offers a minor in computer technology to students majoring in other areas of study at IUPUI. The computer information technology minor provides a basic set of computer concepts and programming courses along with a sequence of computing specialty courses.

CIT also offers Web-based certificate programs, which can be completed via distance education. The IT Certificate for Web Development focuses on the principles and techniques used to develop Web-based business applications. The six courses that comprise the program cover the application development process including analysis, design, Web programming, database integration and implementation.

The E-Commerce Development Certificate focuses on Web-based application development. Interested students

should have at least two to three years of application development experience or have completed the IT Certificate for Web Development. Students in the E-Commerce Development certificate can choose to develop their programming skills using either ASP, NET or Java. Upon completion of the E-Commerce Development Certificate, students will have the skills and knowledge to build and maintain data driven e-commerce sites.

CIT offers a Network Security Certificate (NSC) program accredited by The Committee on National Security Systems (CNSS) that addresses the ever-growing need in security. The NSC provides information assurance and security education and training to students and professionals. This program is hands-on and requires students to have some networking and systems experience. Completion of the NSC provides students with a solid foundation in security techniques and prepares participants to work in information assurance and network security. The certificate consists of six courses and is designed so that it can be completed within three semesters.

CIT offers a Computer Technology Applications Certificate (CTAC). CTAC is a six-course, 18-credit-hour sequence of classes designed to give you a strong background in computer applications. It will equip you with technology expertise to support your professional academic endeavors and help you transition to the technology of the future. In the required courses, you will use software applications rather than programming to build web sites, develop software training modules, create other interactive IT products, and complete a service learning project. Electives allow you to explore personal-use topics such as IT for the consumer, home networking, and protecting yourself in cyberspace or professional topics such as ethics, IT fundamentals, HTML, and desktop publishing.

Courses in any of the certificate programs may be applied directly to the Bachelor's degree in Computer and Information Technology.

For more information, visit our Web site at cit.iupui.edu or contact Computer and Information Technology at (317) 274-9705 or via email: cit@iupui.edu.

Bachelor of Science in Computer & Information Technology

This program is accredited by the Computing Accreditation Commission, ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202, (410) 347-7700.

The Program Objectives for the B.S. in Computer and Information Technology are:

1. Apply appropriate information technologies and methodologies to enable an organization to meet its goals.
2. Create, maintain and secure the information technology infrastructure of an organization.
3. Communicate effectively in oral, written, and visual modes in interpersonal and group environments.
4. Act professionally and ethically both as individuals and as members of diverse workplace teams.
5. Engage in ongoing professional development and learning activities.

General Requirements

Completion of the CITBS requirements of a selected concentration and a minimum of 121 credit hours.

1. A minimum of 39 credit hours must be earned in courses at the 300 level or higher. Students must verify upper-level credit with a CIT advisor.
2. Students are required to complete at least two of the four RISE experiences - research, international, service learning, and experiential learning. See an advisor for details.

Requirements for Bachelor of Science in Computer and Information Technology (CITBS)

The bachelor's degree requirements are fulfilled by meeting all of the requirements of a selected concentration. Four concentrations are available for a student to select: Data Management, Information Security, Networking Systems, and Web Development.

Overall - completion of 121 credit hours, meeting the following minimums:

- 39 credit hours in upper level courses
- 32 credit hours in residency in the School of Engineering & Technology
- 12 credit hours in upper level CIT courses
- 2.0 GPA

Core Requirements - 63 credit hours

- CIT Core - 36 credit hours
- CIT Concentration - 21 credit hours
- CIT Selectives - 6 credit hours

Leadership Core - 10 credit hours

- Human Behavior (3 credit hours)
- Ethics (3 credit hours)
- Project Management (3 credit hours)
- Career Planning (1 credit hour)

General Education - 30 credit hours

- Communications (composition, speech, and report writing) - 12 credit hours
- Mathematics/Science - 18 credit hours
- Science electives may come from chemistry, geology, physics, and life sciences; however, a laboratory must be associated with the course.

Free Electives - 18 credit hours

- Electives must include 9 units in the same (non-CIT) subject area with at least 3 units at the 300/400 level, but not ECON-E270, PSY-B 30500 or SOC-R 359.
- Minor or Certificates are recommended. See advisor for details.

Specific Concentration Areas

Data Management - Concentration Requirements (21 credits)

- **30000-level Programming** - 3 credit hours
- **CIT 49900** Database Programming - 3 credit hours
- **CIT 34400** Database Security - 3 credit hours
- **CIT 49900** Advanced Database Design - 3 credit hours

- **CIT 41200** XML-Based Web Applications - 3 credit hours
- **CIT 47900** Database Administration - 3 credit hours
- **CIT 49900** Data Warehouse and Mining - 3 credit hours

Information Security - Concentration Requirements (21 Credits)

- **CIT 35600** Network O/S Administration - 3 credit hours
- **CIT 40600** Advanced Network Security - 3 credit hours
- **CIT 41500** Advanced Network Administration - 3 credit hours
- **CIT 42000** Digital Forensics - 3 credit hours
- **CIT 43100** Applied Security Protocols - 3 credit hours
- **CIT 45100** IT Risk Assessment - 3 credit hours
- **CIT 46000** Wireless Security - 3 credit hours

Networking Systems - Concentration Requirements (21 Credits)

- **CIT 32700** Wireless Networking - 3 credit hours
- **CIT 40200** Design & Implementation of LANs - 3 credit hours
- **CIT 35600** Network O/S Administration - 3 credit hours
- **CIT 44000** Communications Network Design - 3 credit hours
- **CIT 41500** Advanced Network Administration - 3 credit hours
- **CIT 40600** Advanced Network Security - 3 credit hours
- **CIT 38100** Unix Programming & Admin - 3 credit hours

Web Development - Concentration Requirements (21 Credits)

- **CIT 27000 or CIT 21500 or CIT 24200** Programming - 3 credit hours
- **CIT 31200** Advanced Web Site Design - 3 credit hours
- **CIT 30000 Level Programming** - 3 credit hours
- **CGT Selective** - 3 credit hours
- **CIT 37400** Systems and Database Analysis - 3 credit hours
- **CIT 41200** XML-Based Web Applications - 3 credit hours
- **CIT 43600** Advanced E-Commerce or **CIT 34400** Database Programming - 3 credit hours

Minor in Computer Technology

A minor in computer technology requires the completion of either 18 or 19 credit hours of computer technology courses, plus prerequisite requirements in mathematics, and computer applications. Required courses in computer technology are provided in two groupings: (a) core requirements, and (b) a specialty sequence. At least 12 credit hours of the minor must be taken at IUPUI.

Students who wish to complete a minor in computer technology must already be accepted as a major by some other department on the IUPUI campus. Students should ask their department's academic advisor whether a minor in computer technology is acceptable with their major field.

A student who applies for a computer technology minor must have completed a mathematics competency as evidenced by completing MATH-M 118 and M 119 or MATH 15300 and 15400, or MATH 15900, and a college-level computer literacy course (equivalent to CIT 10600).

The computer technology minor's core requirements (12 credit hours):

- **CIT 10600** Using a Personal Computer - 3 credit hours
- **CIT 11200** Information Technology Fundamentals **or BUS S302** Management Information Systems - 3 credit hours
- **CIT 14000** Programming constructs Laboratory - 3 credit hours
- **CIT 21200** Web site Design - 3 credit hours

Prior to continuing into the specialty sequences, a student must have:

1. attained the mathematics and computer literacy ability evidenced by college-level courses,
2. completed the above computer technology minor's core requirements,
3. completed 30 credit hours toward his or her major,
4. earned a cumulative grade point average (GPA) of 2.0 or higher.

The student who has met these conditions then selects one of the specialty sequences below and proceeds to complete the three courses of that selected specialty.

The computer technology specialty sequences are:

Application Development (12 cr.)

- **CIT 21400** Intro to Data Management (3 cr.)
- **CIT 21300** Systems Analysis and Design **or BUS A337** Computer Based Accounting Systems Analysis (3 cr.)
- **CIT 21500** Web Programming **or CIT 27000** Java Programming I or **CIT 24200** Intro to ASP.Net Programming - (3 cr.)
- **CIT 37400** Systems & Database Analysis (3 cr.)

Network Systems (12 cr.)

- **CIT 20700** Data Communications (3 cr.)
- **CIT 20200** Network Fundamentals (3 cr.)
- **CIT 20300** - Information Security Fundamentals (3 cr.)
- **CIT 35600** Network O/S Administration (3cr.)

Web Technologies (12 cr.)

- **CIT 21400** Intro to Data Management (3 cr.)
- **CIT 21500** Web Programming (3 cr.)
- **CIT 31200** Advanced Web Site Design (3 cr.)
- **CIT 31300** Commercial Web Site Development (3 cr.)

Database Systems (12 cr.)

- **CIT 21400** Intro to Data management (3 cr.)

- **CIT 21500** Web Programming **or CIT 27000** Java Programming I **or CIT 24200** Intro to ASP.Net Programming (3 cr.)
- **CIT 49900** Database Programming (3 cr.)
- **CIT 49900** Advanced Database Design (3 cr.)

Information Security (12 cr.)

- **CIT 20700** Data Communications (3 cr.)
- **CIT 20300** Information Security Fundamentals (3 cr.)
- **CIT 40600** Advanced Network Security (3 cr.)
- C**IT 32700** Wireless Communication **or CIT 43100** Applied Secure Portocols **or CIT 45100** IT Risk Assessment (3 cr.)

IT Certificate for Web Development

The IT Certificate for Web Development program requires the completion of **18 credit hours**, all delivered over the Web. The courses cover the principles and techniques of the application development process as they apply to a Web environment.

Students who complete the Information Technology Certificate will be able to:

- Apply the tools and techniques for effective Web site planning and analysis
- Create dynamic data driven web sites
- Utilize both client and server side languages in developing e-commerce sites.
- Apply optimal Web design strategies to deploy e-commerce Web applications for a global audience
- Research, learn and apply new web technologies
-

The Information Technology Certificate requirements are:

- **CIT 21200** Web Site Design (3 cr.)
- **CIT 21300** Systems Analysis and Design (3 cr.)
- **CIT 21400** Intro to Data Management (3 cr.)
- **CIT 21500** Web Programming (3 cr.)
- **CIT 31200** Advanced Web Site Design (3 cr.)
- **CIT 31300** Commercial Web site Development (3 cr.)

For more information: IT Certificate for Web Development Web Page

Computer Technology Applications Certificate

The Computer Technology Applications Certificate (CTAC) requires the completion of **18 credit hours.** The courses cover intro and advanced use of computer applications.

Students who complete the Computer Technology Applications Certificate will be able to:

- Use traditional office application software at the highest level
- Customize and modify application software for end users
- Train end users of application software in best practices
- Research, learn, and apply new software techniques
- Create sophisticated and interactive Web interfaces using application software
- Use Web 2.0 tools to further their career

The Computer Technology Applications Certificate requirements are:

- **CIT 10600** Using a Personal Computer (3 cr.)
- **CIT 20600** Advanced Applications and Desktop Publishing (3 cr.)
- **CIT 30600** Computer Technology Applications Capstone (3 cr.)

Electives (Choose 3):

- **CIT 11200** Information Technology Fundamentals (3 cr.)
- **CIT 21200** Web Site Design (3 cr.)
- **CIT 30100** Digital Technologies for the Consumer (3 cr.)
- **CIT 34600** Desktop Publishing Applications (3 cr.)
- **OLS 26300** Ethical Decisions in Leadership (3 cr.)

For more information: Computer Technology Applications Certificate Web Page

E-Commerce Development Certificate

The E-Commerce Development Certificate requires the completion of 18 credit hours. The program covers the skills and knowledge to build and maintain data driven e-commerce sites.

Students who complete the E-Commerce Development Certificate will be able to:

- Apply the fundamental concepts of object-oriented programming
- Develop database-driven web applications for multiple browsers and platforms
- Design, describe, and develop a complex web-based software product

The E-Commerce Development Certificate requirements are:

- **CIT 21300** Web-Based Analysis & Design (3 cr.)
- **CIT 31200** Advanced Web Site Design (3 cr.)
- **CIT 41200** XML-Based Web Applications (3 cr.)
- **CIT 43600** Adv. E-Commerce Development (3 cr.)

A**SP.Net Programming Track**

- **CIT 24200** Introduction to ASP.Net Programming (3 cr.)
- **CIT 34700** Advanced ASP.Net Programming (3 cr.)

Java Programming Track

- **CIT 27000** Introduction to Java (3 cr.)
- **CIT 32900** Java Server Programming (3 cr.)

For more information: E-Commerce Development Certificate Web Page

Network Security Certificate

The Network Security Certificate requires the completion of 18 credit hours. The program covers information assurance and security. It requires students to have some networking and systems experience.

Students who complete the Network Security Certificate (NSC) will be able to:

- Apply information assurance and security principles to secure systems and networks
- Conduct accurate and comprehensive digital forensics investigations and apply appropriate rules of evidence
- Use an appropriate analytic framework to assess risk and recommend strategies for mitigation.

The Network Security Certificate requirements are:

- **CIT 20300** Information Security Fundamentals (3 cr.)
- **CIT 40600** Advanced network Security (3 cr.)
- **CIT 42000** Digital Forensics (3 cr.)
- **CIT 43100** Applied Secure Protocols (3 cr.)
- **CIT 45100** IT Risk Assessment (3 cr.)
- **CIT 46000** Wireless Security (3 cr.)

For more information: Network Security Certificate Web Page

Organizational Leadership and Supervision

Associate Professors S. Hundley, C. Feldhaus, T. Egan
Clinical Professors P. Fox (*Associate Chair*), T. Diemer
Senior Lecturer R. Wolter
Visiting Lecturer J, Little-Wiles, R Markoff
Program Advisor E. Wager

This program offers a broad based education for those students who desire leadership roles in business, government, technology and industry. A guiding vision of the department is to close the gap between theory and practice. In addition to a Bachelor of Science (B.S.) degree, OLS offers a Certificate in Human Resource Management, International Leadership, and Leadership Studies. The Certificate in Leadership Studies is only available to non-majors.

The degree programs are flexible to meet the needs of both traditional and nontraditional students. As part of a relevant and practical discipline, our programs integrate a series of core courses with a choice of concentration tracks. The core courses offer a strong foundation in leadership, communication and general education, mathematics, and science. Concentration tracks allow students to develop their interests and talents within a particular technical or related field. Students may select courses from the following related areas of study towards a minor, certificate, or concentration area:

- Architectural Technology (ART)
- Computer & Information Technology (CIT)
- Communication Studies (COMM)
- Computer Graphics Technology (CGT)
- Construction Engineering Management Technology (CEMT)
- Dental Assistant Program (DAST)
- Electrical and Computer Engineering Technology (ECET)
- Interior Design (INTR)
- Mechanical Engineering Technology (MET)
- Music Technology (MUS)
- Allied Health
- Business
- Engineering
- Informatics (INFO)
- Nursing, Dental hygiene
- Science (BIOL, CHEM, PHYS)
- School of Public and Environmental Affairs (SPEA)
- Tourism, Convention, & Events Management (TCEM)
- World Languages (WLAC)
- Ivy Tech & Vincennes University Associates Degrees (except General Studies)
- Ivy Tech & Vincennes University AAS Degrees

Students are encouraged to complete a minor, certificate, or dual baccalaureate degree through the completion of their related area of study.

The B.S. degree increases the range and depth of the student's education in technical and leadership areas. Graduates are prepared to assume leadership positions in a variety of organizational functions as well as to pursue graduate degrees. The degree requirements are arranged in three areas of study: leadership and supervision, math/science/technology (or related area of study), and general education requirements (communication, behavioral/social science, humanities, and electives.

Students working toward their B.S. degrees may earn two or more certificates in specialty areas in OLS. For example, by taking a combination of specific OLS course electives, students may earn a certificate in Human Resource Management without taking courses beyond the 120 credit hours required for the B.S. degree. Academic advisors will assist the student in selecting courses needed to meet the requirements in the concentration area.

The program learning outcomes for the B.S. in Organizational Leadership and Supervision are:

1. Demonstrate and apply knowledge of:

- the process and roles of leadership.
- leadership traits.
- leadership behavior concepts.
- situational approaches to leadership.
- power and influence.
- leading during times of uncertainty, turbulence, and change.

1. Design and conduct research, as well as analyze and interpret data in order to:

- evaluate their personal leadership effectiveness.
- evaluate their organization's effectiveness and sustainability.
- evaluate their organization's social and environmental impact.

1. Lead an organization, or processes and functions within it that meet or exceeds desird needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.
2. Function on multi-disciplinary teams.
3. Identify, formulate, and solve organizational problems.
4. Understand professional and ethical responsibility.

5. Communicate effectively verbally and nonverbally to all size audiences.
6. Understand the impact of leadership and supervision in a global, economic, environmental and societal context.
7. Demonstrate knowledge of contemporary organizational issues.
8. use the techniques, skills, tools and concepts necessary for effective strategic and tatical planning.

Transfer Students

Where Applicable, the OLS Department accepts credit hours earned at Ivy Tech, Vincennes University or other similarly accredited colleges and universities to satisfy up to 64.0 credit hours of general education, elective, and related concentration requirements for the Bachelor of Science degree in OLS. Students who have successfully completed an AS or AAS degree prior to their application to IUPUI with a GPA of 2.7 or higher and all math, science, and communication requirements complete may enroll in an accelerated leadership curriculum. Adult Programs in Leadership for Undergraduate Studies (A+PLUS) accepts 25 students each fall and spring. To be eligible for A+PLUS, students must complete the AS or AAS degree from a regionally accredited 2-year or 4-year college or university aft 1991 and meet with other IUPUI and OLS admission requirements. For more information, call (317) 278-0286 or email tlcgroup@iupui.edu.

Bachelor of Science in Organizational Leadership & Supervision

The B.S. degree in Organizational Leadership and Supervision requires a total of 120 credit hours. Of the 46 credit hours required in OLS, 25 must result from taking OLS 10000, 25200, 26300 or 34600, 27400, 32700, 37100, 39000, 48700, and 49000. The balance of the requirements for graduation are as follows:

1. 21 additional credit hours of OLS elective course work beyond the required courses above, for a total of 46 credit hours of OLS (one OLS elective must fulfill the IUPUI RISE requirement for learning drawn from research, international experience, service, or experiential learning such as internships or coops) completes the OLS Core.
2. 24 credit hours in an applied technology or related competency that complements OLS and directly relates to specific career interests such as CEMT, CIT, ECET, MET, business, nursing, allied health, SPEA, informatics, etc. These courses must be related to a second degree, a minor, a certificate, or reflect some logical combination of courses. Students will be directed to the appropriate advisor for a certificate, or minor; and the faculty in that department will counsel the student for those required courses. Note: Students must have the set of courses they plan to apply to the related technology area preapproved by an OLS academic advisor.
3. CIT 10600 or similar computer applications coursework, TECH 10200 or TCM 25000, 3 credit hours of any physical science, Economy Course (ECON-E 201, IET 35000), 3 credit of statistics, and 6 credit hours in mathematical skills (above MATH 11100) must be completed by all students to round out the mathematics, science, and Technology Core.
4. 3 credit hours in behavioral or social sciences, selected from courses in anthropology, psychology, sociology, economics,and/or geography; e credit hours in humanities, selected from courses in art, history, literature, music, religion, and/or theater; 12 credit hours in communication, including COMM R110, ENG W131, TCM 22000, and TCM 32000. Senior standing, TCM 32000, and OLS 48700 are prerequisites for OLS 49000 Senior Research Project.
5. 1.0 credit hour of learning community or career planning credit and 12 credit hours of electives from any department "round out" the degree and expose students to different disciplines and ways of thinking and improve their marketability in the workplace by fulfilling requirements for certificates/minors or master's degree prerequisites. Prior course approval by an OLS advisor is strongly recommended.

Certificate Programs

- To enroll in certificate programs, students must be formally admitted by the Office of Admissions on the IUPUI campus. Students must notify the department of intent to pursue each certificate or minor and sign paperwork for program admission and graduation. Credit may be given for applicable courses taken at other colleges or universities. Students may apply these courses toward degree programs in the Organizational Leadership and Supervision Program. To fulfill residency requirements, students must complete a minimum of 50% of coursework in OLS at IUPUI.

Human Resource Management Certificate Program

Although all resources are essential for success, people are an organization's principal resource. How skillfully an organization develops, allocates, and supervises its human resource governs its success or failure. This certificate provides a thorough explanation of the human resource manager's role in helping individuals, work groups, and organizations succeed. The focus of the courses is practical, and each course emphasizes the application of vital concepts so that students will acquire a comprehensive understanding of the subject matter. This Certificate is useful to students who seek careers in human resource management or in other disciplines.

Upon completion of the certificate in Human Resource Management, students should be able to:

- Describe, use, and evaluate tactical and strategic Human resource management principles.
- Develop, implement and provide a safe and effective work environment.
- Comply with local, state, and federal employment law and related public policies.
- Promote training and development of individuals, work teams, and organizations.
- Assess, design, develop, implement, and evaluate learning solutions in various organizational contexts.

- Promote positive, productive employer-employee relationships.
- Create, negotiate, and manage regulations concerning collective bargaining, grievance, and arbitration procedures.
- Leverage compensation, benefits, rewards, and recognition to attract, motivate, and retain talent.
- Develop policy, practice, and procedure to select talent aligned with the strategic direction of the organization.

A certificate will be presented to those who complete graduation paperwork and successfully complete all requirements.

- ***Admission***

  Candidates for this certificate are required to be formally admitted by the IUPUI Office of Admissions, but are not required to be students in the Purdue School of Engineering and Technology. Each student must meet with an OLS Advisor to declare their intent to pursue the certificate and complete the necessary forms.

  Curriculum

  Students are required to successfully complete a total of seven courses (21 credit hours) to earn the certificate. Each course must be completed with a grade of C or higher.

  Required Core Courses - Total Hours: 21

  All students must successfully complete all of the following courses:

  - **OLS 3830**0 Human Resources Management[1] - 3 credit hours
  - **OLS 33100** Occupational Safety and Health - 3 credit hours
  - **OLS 36800** Personnel Law - 3 credit hours
  - **OLS 37500** Training Methods - 3 credit hours
  - **OLS 37800** Labor Relations - 3 credit hours
  - **OLS 47600** Compensation Planning and Management - 3 credit hours
  - **OLS 47900** Staffing Organizations - 3 credit hours

- **Leadership Studies Certificate Program**

  The Certificate in Leadership Studies equips students with the knowledge, skills, experiences, attitudes, perspectives, and tools necessary to understand the broad-based concepts associated with leadership in a variety of individual, organizational, and community settings in an ever changing, pluralistic, global society. A unique feature of this certificate is its ability to attract a diverse group of students from across the myriad of disciplines taught at IUPUI. Such a strong mixture of interdisciplinary perspectives augments the richness of learning that occurs in certificate courses.

  Students who complete the certificate in Leadership Studies will be able to:

  - Define and defent their personal philosophy of leadership and ethical behavior.
  - Describe behavior in organizational settings at the individual, team/group, and macro-organization levels.
  - Identify the stages of team development that occurs within organizations.
  - Make leadership-oriented decisions that are ethically, legally, morally, and strategically sound.
  - Apply concepts of supervisory management, team building, personnel selection and development, decision-making, resource allocation, conflict resolution, and strategic planning to the solving of individual, team/group, and organizational problems.
  - Explain the importance of attracting, managing, and motivating a globally-diverse workforce.
  - Improve individual and organizational performance by applying the appropriate leadership theories and processes in practice.
  - Evaluate the appropriateness of leadership behaviors in given situations, and make suggestions for improving those behaviors.

- ***Admission***

  Candidates for this certificate are required to be formally admitted by the IUPUI Office of Admissions, but are not required to be students in the Purdue School of Engineering and Technology. Credit will be given for applicable courses taken at other colleges and universities. Credits earned while completing this certificate may be subsequently applied toward the B.S. degree in Organizational Leadership and Supervision (OLS). Each student must meet with an OLS Advisor to declare their intent to pursue the certificate and complete the necessary forms; however, **students with a declared major in OLS are not eligible to earn the leadership studies certificate, due to curricular redundancy.**

  Prerequisites

  English W131 and Communication R110 are *encouraged prerequisites* for enrollment in OLS 252, 263, and 274, and are *required prerequisites* for enrolling in any 300- or 400-level OLS course.

  Curriculum

  Students are required to successfully complete a total of six courses (18 credit hours) to earn the certificate. Each course must be completed with a grade of C or higher.

  - **OLS 25200** Human Behavior in Organizations[1] - 3 credit hour
  - **OLS 26300** Ethical Decisions in Leadership[1] - 3 credit hours

- **OLS 27400** Applied Leadership[1] - 3 credit hours
- **OLS 32700** Leadership for a Global Workforce - 3 credit hours
- **OLS 39000** Leadership Theories and Processes - 3 credit hours
- **OLS 3xx** Any OLS 30000 - or 40000-level Selective Course - 3 credit hours

- Students must complete 200-level courses prior to enrolling in OLS 32700 and OLS 39000 and meet with an OLS Advisor to complete paperwork and an application for graduation prior to enrolling in OLS 39000.

International Leadership Certificate

The interdisciplinary International Leadership Certificate is designed to provide the knowledge, skills, abilities, perceptions, and experiential learning opportunities appropriate for any student interested in supervising or leading individuals from different countries or preparing for international work assignments. Students who complete the International Leadership Certificate will develop the tools necessary to understand the broad-based concepts associated with leadership in a variety of individual, organizational, and community settings in an ever changing, pluralistic, global society.

Students who complete the Certificate in International Leadership will be able to:

- Demonstrate techniques to analyze and solve intercultural problems that typically occur within diverse organizations.
- Use knowledge and techniques to devise strategies for successfully managing diversity within an international organization.
- Apply knowledge and techniques to devise strategies for successfully leading a diverse workforce within an international organization.
- Demonstrate substantial knowledge of at least one foreign country, or region, (or distinct subculture within the USA), including demographic profile, economic status, political climate, commerce, history, language, and cultural norms as a result of intensive experience and/or study.

- ***Admission***

  Candidates for this certificate are required to be formally admitted by the IUPUI Office of Admissions, but are not required to be students in the Purdue School of Engineering and Technology. Credit will be given for applicable courses taken at other colleges and universities. Credits earned while completing this certificate may be subsequently applied toward the B.S. degree in Organizational Leadership and Supervision (OLS). Each student must meet with an OLS Advisor to declare their intent to pursue the certificate and complete the necessary forms.

Prerequisites

English W131 and Communication R110 are *encouraged prerequisites* for enrollment in any OLS 200-400 level courses.

Curriculum

Students are required to successfully complete a total of seven courses (21 credit hours) to earn the certificate. Each course must be completed with a grade of C or higher.

- **OLS 25200** Human Behavior in Organization[1] - 3 credit hours
- **OLS 32700** Leadership for a Global Workforce - 3 credit hours
- **OLS 32800** Principles of International Business - 3 credit hours
- **OLS 45400** Gender and Diversity in Management - 3 credit hours
-

- 9 credit hours of International Experience/Foreign Language to be fulfilled by taking a combination of course work in the following areas:

- 3•- 6 credit hours of a single foreign language
  3 - 6 credit hours of approved international experience* (OLS 42300, Mexico, Immersion, or OVST)

  **International Experience includes all IU/IUPUI Study Abroad, Service Learning work in a bi-lingual setting, or other approved international experience.*

Honors Minor in Leadership

The Honors Minor in Leadership consists of five Honors courses (15 credit hours), providing high-potential IUPUI undergraduates admitted to the new IUPUI Honors College or other degree programs exposure to current theory and practice designed to prepare students for future leadership roles and/or advanced degrees. Each of the Interdisciplinary Leadership Principles in the Honors Minor in Leadership directly relates to the IUPUI Principles of Undergraduate Learning. Students admitted to the Honors Minor in Leadership must take a sequence of five courses exploring topics covering a wide range of leadership principles including:

1. Foundations of Leadership (3 credit hours of **honors BUS-Z 174, OLS 25200**, BUS-Z 304, or SPEA-V 366)

2. Ethical, Social, and Political Components to Leadership (3 credit hours of **honors OLS 26300**, BUS-W 494, SPEA-V 412, SPEA-V 473, or other approved courses)

3. Diversity, Global, and Community Leadership (3 credit hours of **honors OLS 32700**, SPEA-V 382, POLS-Y 219, or ANTH-A 361)

4. Theoretical and Practical Aspects of Leadership (3 credit hours of **honors OLS 39000**, BUS-J 402, or SPEA-V 362)

5. Honors RISE Experience in Leadership (3 credit hours of approved honors Research, International, Service, or Experiential Learning coursework)

At least two Honors courses (6.0 credit hours) must be taken outside of the student's primary discipline (*recommended) and students must complete paperwork to declare their intent to pursue the minor and complete a formal Application for Graduation (ET 309: Organizational Leadership and Supervision) to ensure this credential is properly recorded on their official transcripts. Students not enrolling in a designated Honors section must complete the Honors Contract to ensure credit is properly denoted on transcript.

For more information, contact OLS at 317-278-0286 or the IUPUI Honors College at 317-274-7193.

- Web: http://honorscollege.iupui.edu.

Electrical and Computer Engineering (ECE)

Professors Y. Chen (*Chair*), S. Chien, M. El-Sharkawy, M. Rizkalla, D. Russomanno, P. Schubert, K. Varahramyan
Associate Professors E. Du, D. Kim, B. King, S. Koskie, J. Lee, S. Rovnyak, P. Salama
Assistant Professors L. Christophor, E. dos Santos, L. Li
Research Professors M. Agarwal, J. Saleem, S. Shrestha

The Department of Electrical and Computer Engineering offers programs at the bachelor's, master's, and doctoral levels. At the bachelor's degree level, the department offers programs leading to the Bachelor of Science in Engineering (B.S.E.), Bachelor of Science in Computer Engineering (B.S.Cmp.E.), and Bachelor of Science in Electrical Engineering (B.S.E.E.) degrees. The B.S.E. degree program is designed for students who desire broad flexibility and the opportunity for interdisciplinary study; it does not have a designated professional curriculum. Additional information about the B.S.E. program can be obtained from the faculty in the Department of Electrical and Computer Engineering. The programs leading to the B.S.E.E. and B.S.Cmp.E. are described in this section. Graduate programs in electrical and computer engineering are described in the section entitled "Graduate Engineering Programs" in this bulletin.

Electrical and computer engineering programs are designed to prepare students for careers in the commercial, government, and academic sectors, where electrical and computer engineering expertise is needed in hardware and software design, information processing, circuit and electronics, control and robotics, communications and signal processing, energy systems, and manufacturing. Programs in the department are enhanced by interaction with local industry. Students have direct and routine access to full-time faculty, which further strengthens and accelerates the learning process. These advantages and the metropolitan environment of the university lead to an application-oriented, practical education that prepares students for success.

The Department of Electrical and Computer Engineering regards research as an important catalyst for excellence in engineering education. Graduate research and undergraduate design projects in the areas of signal processing, communications, image processing, computational intelligence, networking, software engineering, embedded systems, high performance computing, control, robotics, manufacturing, biometrics, nanotechnology, and ASIC and FPGA based electronics offer opportunities for applying and deepening students' expertise.

An undergraduate education in electrical and computer engineering provides a strong foundation in the mathematical, physical, and engineering sciences. In acquiring this knowledge, students must also develop problem-solving skills. In addition, the general-education courses in the program provide communication skills and the appreciation of human and social issues necessary to translate engineering achievements into advances for society.

For more information, contact the Department of Electrical and Computer Engineering at (317) 274-9726.

B.S in Electrical Engineering

This program is accredited by the Engineering Accreditation Commission, ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202, (410) 347-7700.

The B.S.E.E. degree program prepares students for career opportunities in the hardware and software aspects of design, development, and operation of electronic systems and components, embedded systems, control and robotics, communications, digital signal processing, and energy systems. Challenging positions are available in the government, commercial, and education sectors, in the areas of electronics, communication systems, signal and information processing, power, automation, robotics and manufacturing, control, networking, information processing, and computing. Within these areas, career opportunities include design, development, research, manufacturing, marketing, operation, field testing, maintenance, and engineering management.

The Program Educational Objectives of the Electrical Engineering degree program are to prepare graduates who will be successful in their chosen career paths by:

1. becoming productive and valuable engineers in the private or public sector
2. pursuing and completing graduate studies, and/or
3. taking on leadership roles in their professions, as well as in their communities and the global society

The minimum number of credit hours for graduation is 126, distributed as follows for each discipline:

1. Mathematics and Physical Sciences
   - Calculus: MATH -16500, 16600, 17100, 26100, 26600 - 18 credit hours
   - Chemistry: CHEM C10500 - 3 credit hours

- Physics: PHYS 15200 and 25100 - 9 credit hours
- Math/Science elective - 3 credit hours

2. Communications and Ethics
- Speech: COMM R110 - 3 credit hours
- Writing: ENG W131 - 3 credit hours
- Communication in Engineering Practice: TCM 36000 - 2 credit hours
- Engineering Ethics and Professionalism: ECE 21000, ECE 40100 - 2 credit hours

3. General Education Electives
- ECON-E 201 or ECE 32700 - 3 credit hours
- Electives - 12 credit hours

4. Freshman Engineering Courses
- Introduction to the Engineering Profession: ENGR 19500 - 1 credit hour
- Introduction to Engineering: ENGR 19600 - 3 credit hours
- Comp Tools for Engr: ENGR 29700 - 1 credit hour

5. Engineering Science
- Circuits: ECE 20100, 20200, and 20700 - 7 credit hours
- Systems and Fields: ECE 30100, 30200, and 31100 - 9 credit hours
- C Programming: ECE 26100 and ECE 26300 - 4 credit hours
- ME 29500 - 3 credit hours

6. Engineering Design
- Electronics: ECE 20800 and 25500 - 4 credit hours
- Digital Systems: ECE 27000 and 36200 - 8 credit hours
- Communication Systems: ECE 44000 - 4 credit hours
- Control Systems: ECE 38200 - 3 credit hours
- Capstone Design: ECE 48700 and 48800 - 3 credit hours
- EE and Tech Electives - 15 credit hours

7. Restricted Electives - 3 credit hours

Semester by semester, the 126 total credit hours can be distributed as follows:

Freshman Year

First Semester (17 credit hours)

- ENGR 19500 Introduction to the Engineering Profession - 1 credit hour
- ENGR 19600 Introduction to Engineering - 3 credit hours
- CHEM C10500 Chemical Science I - 3 credit hours
- MATH 16500 Analyt. Geometry and Calc. I - 4 credit hours
- COMM R110 Fundamentals of Speech Communication - 3 credit hours
- General Education - 3 credit hours

Second Semester (17 credit hours)

- PHYS 15200 Mechanics - 4 credit hours
- MATH 16600 Analyt. Geometry and Calc. II - 4 credit hours
- Math 17100 Multidimentional Math - 3 credit hours
- ENG W131 Elementary Composition I - 3 credit hours
- General Education Elective[1] - 3 credit hours

Sophomore Year

Third Semester (17 credit hours)

- MATH 26100 Multivariate Calculus - 4 credit hours
- PHYS 25100 Electricity and Optics - 5 credit hours
- ECE 20100 Linear Circuit Analysis I - 3 credit hours
- ECE 20700 Electronic Measurement Techniques - 1 credit hour
- ECE 26300 C Programming - 3 credit hours
- ECE 26100 C Programming Lab - 1 credit hour

Fourth Semester (16 credit hours)

- MATH 26600 Ordinary Diff. Eqn - 3 credit hours
- ECE 20200 Circuit Analysis II - 3 credit hours
- ECE 25500 Introduction to Electronics Analysis and Design - 3 credit hours
- ECE 20800 Electronic Design and Devices Lab - 1 credit hour
- ECE 27000 Digital Logic Design and Lab - 4 credit hours
- ENGR 29700 Computer Tools for Engineers - 1 credit hour
- ECE 21000 Sophomore Seminar 1 - 3 credit hours

Junior Year

Fifth Semester (16 credit hours)

- ECE 30100 Signals and Systems - 3 credit hours
- ECE 31100 Electric and Magnetic Fields - 3 credit hours
- ECE 36200 Microprocessor Systems and Interfacing - 4 credit hours
- TCM 36000 Comm. In Engineering Practice - 3 credit hours
- Math/Science/Technical Elective[2]- 3 credit hours

Sixth Semester (15 credit hours)

- ECE 30200 Probabilistic Methods in Electrical Engineering - 3 credit hours
- ECE 38200 Feedback System Analysis - 3 credit hours
- ECE 32700 Engineering Economics - 3 credit hours
- ME 29500 Mechanicss and Heat - 3 credit hours
- EE Elective[4] - 3 credit hours

Senior Year

Seventh Semester (15 credit hours)

- ECE 44000 Introduction to Communication Systems Analysis - 4 credit hours
- ECE 48700 Senior Design I - 1 credit hour
- ECE 40100 Ethics - 1 credit hour

- EE Electives[4] - 6 credit hours
- Humanities or Social Science Elective[1] - 3 credit hours

Eighth Semester (14 credit hours)

- ECE 48800 Senior Design II - 2 credit hours
- EE Electives[4] - 6 credit hours
- Restricted Elective[5] - 3 credit hours
- General Education Elective[1] - 3 credit hours

After completing a rigorous, broad education in electrical and computer engineering during the first five semesters, juniors and seniors may select advanced electrical and computer engineering courses and technical elective courses from an approved list. Careful selection of these elective courses allows a student to concentrate in a specialized area of electrical engineering. A listing of acceptable electrical engineering and technical elective courses is given below. The actual course selection will depend on the schedule, as not every course is available every semester. Existing upper-level electrical engineering courses are offered in the areas of signal processing, imaging, robotics, control systems, VLSI, electronic circuits and manufacturing, nano technology, energy systems, network and data communication, software engineering, and embedded systems design. The Department of Electrical and Computer Engineering groups these and other allowable courses into several areas of tracks. An electrical and computer engineering student should file a plan of study with an academic advisor in the sophomore year to decide how to select these electives.

[1] From approved general education elective list.

[2] From approved math/science elective list.

[3] From approved technical elective list.

[4] From approved electrical engineering elective list.

[5] From lists 1-4.

EE Elective Courses choose 15 credit hours

Any non-required ECE 30000-level or above, except ECE 32600 or ECE 32700.

Students wishing to take a 50000-level course must meet with an academic advisor for permission to register for the course.

Math/Science/Technical Elective Courses: Choose 3 credit hours from the list of Math/Science Electives or the list of Technical Electives.

- MATH 33300: Chaotic Dynamical Systems
- MATH 35100: Elementary Linear Algebra
- MATH 51000: Vector Calculus
- MATH 52000: Boundary Value Prob. of Diff. Eqn.
- MATH 51100: Linear Algebra with Applications
- MATH 52300: Introduction to Partial Diff. Eqn.
- MATH 52500: Introduction to Complex Analysis
- MATH 52600: Principles of Math. Modeling
- MATH 52700: Advanced Math. Eng. & Physics I
- MATH 52800: Advanced Math. Eng. & Physics II
- MATH 53000: Functions of a Complex Variable I
- MATH 53100: Functions of a Complex Variable II
- MATH 54400: Real Analysis and Measure Theory
- BIOL K10100: Concepts of Biology I
- BIOL K10300: Concepts of Biology II
- BIOL K32400: Cell Biology
- CHEM C10600: Principles of Chemistry II
- CHEM C31000: Analytical Chemistry
- CHEM C34100: Organic Chemistry
- CHEM C36000: Elementary Physical Chemistry
- CHEM C36100: Phys. Chemistry of Bulk Matter
- CHEM C36200: Phys. Chemistry of Molecules
- PHYS 31000: Intermediate Mechanics
- PHYS 34200: Modern Physics
- PHYS 40000: Physical Optics
- PHYS 40000: Quantum Mechanics
- PHYS 52000: Mathematical Physics
- PHYS 53000: Electricity & Magnetism
- PHYS 54500: Solid State Physics
- PHYS 55000: Introduction to Quantum Mechanics

Any 30000-level or above math/science course with prior written approval of students' advisory committee

Technical Elective Courses

Any non-required course from lists of Electrical Engineering Elective or Computer Engineering Elective, or from the following courses.

- ECE 32600: Engineering Project Management
- CSCI 43700: Introduction to Computer Graphics
- ME 20000: Thermodynamics I
- ME 27000: Basic Mechanics I
- ME 27200: Mechanics of Materials
- ME 27400: Basic Mechanics II
- ME 30100: Thermodynamics II
- ME 34400: Introduction to Engineering Material, or
- Students complete three or more 1-credit sessions of either
- ENGR 20000, ENGR 25000, ENGR 30000, ENGR 35000, OR ENGR 40000
- ENGR 20010, ENGR 25010, OR ENGR 30010

*ECE 49500 Selected Topics in Electrical Engineering is generally used to offer new courses.

Restricted Elective: Choose 3 credit hours from any of the aforementioned elective lists.

B.S in Computer Engineering

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202, (410) 347-7700.

The Bachelor of Science in Computer Engineering (B.S.Cmp.E.) degree curriculum provides an in-depth education in the analytical skills, hardware, and software aspects of modern computer systems. The program builds on a strong foundation in engineering design, including traditional analog and digital circuit design. The three main

areas of emphasis within the computer-engineering program are embedded systems, telecommunications and networking, and software engineering and distributed computing. Extensive laboratory experiences support the theoretical aspects of the course work. Students gain valuable digital hardware design and software design experiences throughout the curriculum. The junior and senior years strengthens the student's expertise with courses in data structures, embedded systems, computer architecture, parallel and high performance computing systems, advanced digital systems, and computer communications networks and network security.

The Program Educational Objectives of the Computer Engineering degree program are to prepare graduates who will be successful in their chosen career paths by:

1. becoming productive and valuable engineers in the private or public sector
2. pursuing and completing graduate studies, and/or
3. taking on leadership roles in their professions, as well as in their communities and the global society.

The minimum number of credit hours for graduation is 126, distributed as follows for each discipline:

1. Mathematics and Physical Sciences
- MATH 16500, 16600, 17100, and 26100, 26600 - 18 credit hours
- Chemistry: CHEM C10500 - 3 credit hours
- Physics: PHYS 15200 and 25100 - 9 credit hours

2. Communications and Ethics
- Speech: COMM R110 - 3 credit hours
- Writing: ENG W131 - 3 credit hours
- Communication in Engineering Practice: TCM 36000 - 2 credit hours
- Engineering Ethics and Professionalism: ECE 21000 and 40100 - 2 credit hours

3. General Education Electives
- a. Electives - 15 credit hours

4. Freshman Engineering Courses
- Introduction to the Engineering Profession: ENGR 19500 - 1 credit hour
- Introduction to Engineering: ENGR 19600 - 3 credit hours
- Comp Tools for Engineers: ENGR 29700 - 1 credit hour

5. Engineering Science
- Circuits: ECE 20100, 20200, and 20700 - 7 credit hours
- Systems and Fields: ECE 30100, 30200 - 6 credit hours

6. Engineering Design
- Digital Systems: ECE27000, 36200, and 36500 - 11 credit hours
- Capstone Design: ECE48700, 48800 - 3 credit hours

7. Computer Science
- Computing II: ECE 26100, 26300, and CSCI 24000 - 8 credit hours
- UNIX Programming:ECE 28200 - 1 credit hour
- DiscreetMath: CSCI 34000 - 3 credit hours
- Data Structures: CSCI 36200 - 3 credit hours
- Operating Systems: ECE 40800 - 3 credit hours

8. CmpE Electives[4] - 9 credit hours
9. Advanced CmpE Electives[5] - 6 credit hours
10. Math/Science/Technical Electives[2or3] - 3 credit hours
11. Restricted Electives[6] - 3 credit hours

[1] From approved general education elective list.

[2] From approved math/science elective list.

[3] From approved technical elective list.

[4] From approved computer engineering elective list.

[5] From lists 1-4.

Semester by semester, the 126 total credit hours may be distributed as follows:

Freshman Year

First Semester (17 credit hours)

- ENGR 19500 Introduction to the Engineering Profession - 1 credit hour
- ENGR 196 Introduction to Engineering - 3 credit hours
- MATH 16500 Analytic Geometry and Integrated Calculus I - 4 credit hours
- CHEM C10500 Chemical Science I - 3 credit hours
- COMM R110 Fundamentals of SpeechCommunication - 3 credit hours
- General Education Elective - 3 credit hours

Second Semester (17 credit hours)

- PHYS 15200 Mechanics - 4 credit hours
- MATH 16600 Analytic Geometry and Integrated Calculus II - 4 credit hours
- MATH 17100 Multidimensional Math - 3 credit hours
- ENG W131 Elementary Composition I - 3 credit hours
- General Education Elective - 3 credit hours

Sophomore Year

Third Semester (17 credit hours)

- MATH 26100 Multivariate Calculus - 4 credit hours
- PHYS 25100 Electricity and Optics - 5 credit hours
- ECE 20100 Linear Circuit Analysis I - 3 credit hours
- ECE 20700 Electronic Measurement Techniques - 1 credit hour
- ECE 26100 C programming Lab - 1 credit hour
- ECE 26300 C Programming - 3 credit hours

Fourth Semester (16 credit hours)

- MATH 26600 Ordinary Differential Equations - 3 credit hours
- CSCI 24000 Advanced Programming - 4 credit hours
- ECE 20200 Circuit Analysis II - 3 credit hours

- ECE 27000 Digital Logic Design and Lab - 4 credit hours
- ENGR 29700 Computer Tools for Engineers - 1 credit hour
- ECE 21000 Sophomore Seminar - 1 credit hour

Junior Year

Fifth Semester (16 credit hours)

- ECE 30100 Signals and Systems - 3 credit hours
- ECE 36200 Microprocessor Systems and Interfacing - 4 credit hours
- CSCI 340 Discrete Math - 3 credit hours
- Math/Science/Tech Elective[2 or 3] - 3 credit hours
- General Education Elective[1] - 3 credit hours

Sixth Semester (15 credit hours)

- ECE 302 Probabilistic Methods in Electrical Engineering - 3 credit hours
- ECE 282 UNIX Programming for Engineers - 1 credit hour
- CSCI 362 Data Structures - 3 credit hours
- CmpE Elective[4] - 3 credit hours
- TCM 36000 Comm. In Engineering Practice - 2 credit hours
- ECE 32700 Engineering Economics - 3 credit hours

Senior Year

Seventh Semester (14 credit hours)

- ECE 365 Introduction to the Design of Digital Computers - 3 credit hours
- ECE 48700 Senior Design I - 1 credit hour
- ECE 40100 Engineering Ethics - 1 credit hour
- Advanced Computer Engineering Elect.[5] - 3 credit hours
- CmpE Elective[4] - 6 credit hours

Eighth Semester (14 credit hours)

- ECE 40800 Operating Systems - 3 credit hours
- ECE 48800 Senior Design - 2 credit hours
- Advanced CmpE Elective[4] - 3 credit hours
- CmpE Elective - 3 credit hours
- Restricted Elective[5] - 3 credit hours

[1] From approved general education elective list.

[2] From approved math/science elective list.

[3] From approved technical elective list.

[4] From approved computer engineering elective list.

[5]From approved advanced computer engineering elective list

[6] From lists 1-4.

Advanced Computer Engineering Elective Courses

- ECE 42100 Advanced Digital Systems Design
- ECE 46100 Software Engineering
- ECE 46300 Intro to Computer Communication Networks
- ECE 46800 Introduction to Compilers and Translation Engineering
- ECE 47100 Embedded Systems

Students may also use the 50000-level version of any of these classes

CmpE Elective Courses

Computer Engineering Elective: Choose 9 credit hours from the following list. At least 3 credit hours must be at or above 400-level.

Any non-required ECE 30000 or above courses, except ECE 32600 or ECE 32700

- ECE 25500: Intro. to Electronic Analysis & Design
- CSCI 35500: Intro. to Programming Languages
- MATH 41400: Numerical Analysis
- CSCI 43700: Intro. to Computer Graphics
- CSCI 43500: Multimedia Information Systems
- CSCI 43800: Computer Graphics II
- CSCI 48100: Data mining
- CSCI 44300: Database Systems

* Course ECE 49500 Selected Topics in Electrical Engineering is generally used to offer new courses.

Math/Science/Technical Elective Courses

- MATH 33300: Chaotic Dynamical Systems
- MATH 35100: Elementary Linear Algebra
- MATH 51000: Vector Calculus
- MATH 52000: Boundary Value Prob. of Diff. Eqn.
- MATH 51100: Linear Algebra with Applications
- MATH 52300: Introduction to Partial Diff. Eqn.
- MATH 52500: Introduction to Complex Analysis
- MATH 52600: Principles of Math. Modeling
- MATH 52700: Advanced Math. Eng. & Physics I
- MATH 52800: Advanced Math. Eng. & Physics II
- MATH 53000: Functions of a Complex Variable I
- MATH 53100: Functions of a Complex Variable II
- MATH 54400: Real Analysis and Measure Theory
- BIOL K10100: Concepts of Biology I
- BIOL K10300: Concepts of Biology II
- BIOL K32400: Cell Biology
- CHEM C10600: Principles of Chemistry II
- CHEM C31000: Analytical Chemistry
- CHEM C34100: Organic Chemistry
- CHEM C36000: Elementary Physical Chemistry
- CHEM C36100: Phys. Chemistry of Bulk Matter
- CHEM C36200: Phys. Chemistry of Molecules
- PHYS 31000: Intermediate Mechanics
- PHYS 34200: Modern Physics
- PHYS 40000: Physical Optics
- PHYS 40000: Quantum Mechanics
- PHYS 52000: Mathematical Physics
- PHYS 53000: Electricity & Magnetism

- PHYS 54500: Solid State Physics
- PHYS 55000: Introduction to Quantum Mechanics

Any 300-level or above math/science course with prior written approval of student's advisory committee

: Any non-required course from lists of Electrical Engineering Elective or Computer Engineering Elective or Advanced Computer Engineering Elective, or following courses.

- ECE 32600: Engineering Project Management
- CSCI 30000: Systems Programming
- CSCI 44100: Client-Server Database Systems
- CSCI 48700: Artificial Intelligence
- ME 29500: Engineering Mechanics & Heat

or student can complete three or more 1-credit sessions of either

- a. ENGR 20000, ENGR 25000, ENGR 30000, ENGR 35000, ENGR 40000, or
- b. ENGR 20010, ENGR 25010, OR ENGR 30010,

Restricted elective course: any course in the list of Technical electives, math/science electives, or General Education electives.

B.S in Engineering - Interdisciplinary Engineering

This program is not accredited by the Engineering Accreditation Commission of the ABET.

The Electrical and Computer Engineering Department offers a Bachelor of Science in Engineering (B.S.E.) degree program for students wishing to supplement a strong core curriculum in electrical and computer engineering science and design with courses from mathematics, science, business, biomedicine, or another engineering discipline. While not ABET-accredited, the B.S.E. degree program offers the student greater flexibility to create a plan of study to accommodate broad interdisciplinary interests and objectives. The plan coincides with the traditional B.S.E.E. curriculum through the sophomore year and then diverges to include ECE electives and courses from interdisciplinary areas in the remainder of the curriculum.

The minimum number of credit hours for graduation is 126, distributed as follows for each discipline:

1. Mathematics and Physical Sciences
- Calculus: MATH 16500, 16600, 26100, and 26600 - 18 credit hours
- Chemistry: CHEM C10500 - 3 credit hours
- Physics: PHYS 15200 and 25100 - 9 credit hours

2. Communications and Ethics
- Speech: COMM R110 - 3 credit hours
- Writing: ENG W131 - 3 credit hours
- Communication in Engineering Practice: TCM 36000 - 2 credit hours
- Engineering Ethics and Professionalism: ECE 21000 and 40100 - 2 credit hours

3. Humanities and Social Sciences
- Electives - 15 credit hours

4. Freshman Engineering Courses
- Introduction to the Engineering Profession: ENGR 19500 - 1 credit hour
- Introduction to Engineering: ENGR 19600 - 3 credit hours
- Programming Concepts: ENGR 19700 - 3 credit hours
- ENGR 29700 - 1 credit hour

5. Electrical Engineering Courses
- ECE Core: ECE 20100, 20200, 20700, 20800, 25500, 27000, 30100, and 36200 - 22 credit hours
- ECE Electives (any ECE 30000-, 40000-, or 50000-level course) - 9 credit hours

6. Technical Elective Course - 3 credit hours
7. Interdisciplinary Area
- Core Requirements - 12 credit hours
- Core Electives - 12 credit hours

Freshman Year

First Semester (15 credit hours)

- ENGR 19500 Introduction to the Engineering Profession - 1 credit hour
- ENGR 19600 Introduction to Engineering - 3 credit hours
- CHEM C10500 Principles of Chemistry I - 3 credit hours
- COMM R110 Fundamentals of Speech Communication - 3 credit hours
- MATH 16500 Analytic Geometry and Integrated Calculus I - 4 credit hours

Second Semester (18 credit hours)

- ENGR 19700 Programming Concepts - 3 credit hours
- CHEM C10600 Principles of Chemistry II - 3 credit hours
- ENG W13100 Elementary Composition I - 3 credit hours
- MATH 16400 Integrated Calculus and Analytic Geometry II - 5 credit hours
- PHYS 15200 Mechanics - 4 credit hours

The remainder of the interdisciplinary plan of study is individualized. Students should speak to their academic advisors regarding course selection.

Graduate Programs in ECE

Students can earn the Master of Science in Electrical and Computer Engineering (M.S.E.C.E.), and the Master of Science in Engineering (M.S.E.), through the Department of Electrical and Computer Engineering at the Purdue School of Engineering and Technology at IUPUI. The M.S.E.C.E. degree is organized into several areas of study, including computer engineering, controls and automation, communication, signal processing, VLSI/ASIC design, and power sytems, while the M.S.E. degree is interdisciplinary in nature and is primarily for non-electrical engineering undergraduates. Qualified students may be authorized to pursue the Ph.D. degree in electrical and computer engineering at IUPUI. Programs leading to the Ph.D. in electrical and computer engineering is jointly administered with the School of Electrical and Computer Engineering at Purdue University, West Lafayette. For more information

about graduate electrical and computer engineering programs
visit http://engr.iupui.edu/ece/graduate.shtml?menu=grad.

Engineering Technology (ENT)

Chair: E. Cooney, Professor of Electrical and Computer Engineering Technology **Program Directors: ART- J. Cowan BMET - B. Christe**

CEMT - T. Iseley

CpET - B. Lin

EET - E. Cooney

INTR - E. McLaughlin

MET - P. Yearling
MSTE - P. Hylton

The Department of Engineering Technology offers two degree program at the associate level and seven degree programs at the bachelor's level. ENT offers an Associate of Science degree with a major in Biomedical Engineering Technology (BMET) and Associate of Science with a mojor in Interior Design (INTR). Graduates from the BMET and INTR associate degree programs can continue their education for an additional two years and complete the course work leading to a Bachelor of Science degree. The department offers Bachelor of Science degrees in Biomedical Engineering Technology, Computer Engineering Technology, Construction Engineering Management Technology, Electrical Engineering Technology, Interior Design, Mechanical Engineering Technology, and Motorsports Engineering. The ENT programs are well-suited for individuals who are curious about how things work and want a practice-oriented education. The department faculty members all have practical engineering work experience in their fields of expertise and are able to offer an educational experience that provides graudates with the skills necessary to quickly become productive employees. The faculty is dedicated to teaching and is very focused on meeting the educational needs of students. Daytime, evening and selected web-based courses are offered.

For more information, contact the Department of Engineering Technology at (317) 274-2363, e-mail aland@iupui.edu, or visit our Web site at http://www.engr.iupui.edu/ent.

Biomedical Engineering Technology

Associate Professor B. Christe (*Program Director)*

Associate of Science in Biomedical Engineering Technology

This two-year program consists of a combination of courses in basic electrical circuits, analog and digital electronics, microprocessor fundamentals, mathematics, physics, medical instrumentation, human anatomy, and human physiology. The program is enhanced by the department's interaction with the Indiana University Hospital on the IUPUI campus and with other area hospitals.

The biomedical engineering technology (BMET) curriculum enables graduates to find employment as biomedical equipment technicians, medical equipment sales personnel, medical equipment servicing/maintenance technicians, and research technicians.

The curriculum satisfies the educational requirements of the Association for the Advancement of Medical Instrumentation (AAMI) and the Certified Biomedical Equipment Technician Examination. Courses are offered in the day, evening, and online. Not all courses are offered in all formats.

Graduates of this program may choose to work toward the Bachelor of Science degree program in biomedical engineering technology. Approximately two additional years of study are necessary to complete the requirements for the B.S. in Biomedical Engineering Technology.

Freshman Year

First Semester (14 credit hours)

- **BMET 10500** Introduction to Biomedical Electronics Technology: 1 credit
- **ECET 10900** Digital Fundamentals: 3 credits
- **MATH 15300** Algebra and Trigonometry I: 3 credits
- **ENG W131** Elementary Composition I: 3 credits
- **TECH 102** Discovering Technology: 1 credit
- **TECH 105** Introduction to Engineering Technology: 3 credits

Second Semester (16 credit hours)

- **ECET 10700** Introduction to Circuit Analysis: 4 credits
- **BMET 22000** Applied Human Biology: 3 credits
- **ECET 15500** Digital Fundamentals II: 3 credits
- **COMM R110** Fundamentals of Speech Communication: 3 credits
- **MATH 15400** Algebra and Trigonometry II: 3 credits

Sophomore Year

Third Semester (16 credit hours)

- **ECET 15700** Electronics and Circuit Analysis: 4 credits
- **BMET 20900** Introduction to Microcontrollers: 2 credits
- **BMET 24000** Introduction to Medical Electronics: 3 credits
- **MATH 22100** Calculus for Technology I: 3 credits
- **PHYS 21800** General Physics: 4 credits

Fourth Semester (17 credit hours)

- **CIT 20200** Network fundamentals: 3 credits
- **BMET 32000** Biomedical Electronics Systems: 4 credits
- **BMET 29000** BMET Practicum: 4 credits
- **CIT 17600** Information Technology Architectures: 3 credits
- **PSY B110** Introduction to Psychology: 3 credits

Bachelor of Science in Biomedical Engineering Technology

Building on the foundational coursework completed in the first two years of study in Biomedical Engineering Technology, students focus on developing skills to support technology used in patient care. Students integrate the technical/electrical/computer aspects of medical equipment

with the needs of the medical staff and patients. Graduates will be integral members of the health care team, demonstrating excellent problem solving skills blended with an emphasis on customer service toward the medical staff to result in safe and effective patient care. Some graduates may elect to work directly for medical equipment manufacturers, investigating device design, integration, sales or support.

Program Educational Objectives for Biomedical Engineering Technolgy

The program educational objectives of our department are to produce graduates who will hold these attributes, as measured in the early years of their careers following graduation:

1. Obtain and advance professionally in technical and multidisciplinary positions that require collaboration and customer service, successfully supporting the use of technology in healthcare.
2. Achieve recognition and/or advancement consistent with education.
3. Continue growth in professional knowledge through additional education, certification, or specialized training.

Junior Year

Fifth Semester (15 credit hours)

- **BMET 31000** Intro to Radiography Systems: 3 credits
- **MATH 22200** Calculus for Technology II: 3 credits
- **BUS A200** Foundations of Accounting: 3 credits
- **TCM 22000** Technical Report Writing: 3 credits
- **IET 15000** Quantitative Methods for Tech: 3 credits

Sixth Semester (16 credit hours)

- **CIT 20200** Network Fundamentals: 4 credits
- **BMET 42000** Techn & Patient Populations: 3 credits
- **TCM 32000** Written Comm for Sci & Industry: 3 credits
- **Communication, Humanities, and Social Science** Elective: 6 credits

Senior Year

Seventh Semester (16 credit hours)

- **CIT 40200** Design & Implem Local Area Network: 3 credits
- **BMET 44000** Codes Reg & Patient Safety: 3 credits
- **BMET 49000** Project Planning & Design: 1 credits
- **BMET 49300** Ethics and Professionalism for BMET: 1 credits
- **CHEM C110 and C115** The Chemistry of Life: 3 & 2 credits
- **TCM 38000** Tech Comm in the Healthcare Prof: 3 credits

Eighth Semester (14 credit hours)

- **BMET 47000** Special Topics in BMET: 3 credits
- **BMET 49100** Techinical Project: 2 credits
- **OLS** Elective: 3 credits
- **OLS** Elective: 3 credits
- **Communication, Humanities, and Social Science** Elective: 3 credits

Computer Engineering Technology

Professors E. Cooney *(Chair)*
Associate Professors B. Christe, K. Rennels
Clinical Associate Professor W. Lin

Bachelor of Science in Computer Engineering Technology

Accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, http://www.abet.org

The purpose of the Computer Engineering Technology Program is to train engineering technologists to design, develop, and implement computer-based applications. The CpET program is offered by a partnership between the Department of Engineering Technology and the Computer and Information Technology program. A major emphasis of the CpET program is practice-oriented, "hands-on" training in laboratories to provide students and graduates with a rich experience in computer applications.

B.S. degree graduates will be able to provide technical support for computer systems in advanced manufacturing systems, control systems, networks, telecommunication systems, embedded systems, product development, and instrumentation. Graduates of the B.S. CpET program will have titles such as software technologist, automation engineer, applications software engineer, systems analyst, telecommunications engineer, network administrator and system test engineer.

Program Educational Objectives for Computer Engineering Technology

Three to five years after graduation, alumni of the Computer Engineering Technology prograt at IUPUI will be able to:

1. Meet expectations of employers in technical and professional careers related to the field of Computer Engineering Technology.
2. Achieve recognition and/or advancement consistent with their education.
3. Continue growth in professional knowledge through additional education, certification or licensing.

The Bachelor of Science in Computer Engineering Technology study plan for the industrial computing option is as follows.

Freshman Year

First Semester (16 credit hours)

- **TECH 10200** Discovering Technology: 1 credits
- **TECH 10500** Introduction to Engineering Technology: 3 credits
- **TECH 10400** Tech Graphics Communciation: 3 credits
- **ECET 10900** Digital Fundamentals: 3 credits
- **MATH 15300** Algebra and Trigonometry I: 3 credits
- **ENG W131** Elementary Composition I: 3 credits

Second Semester (16 credit hours)

- **ECET 10700** Introduction to Circuit Analysis: 4 credits
- **CIT 14000** Programming Constructs Lab: 3 credits
- **MATH 15400** Algebra and Trigonometry II: 3 credits
- **TCM 22000** Technical Report Writing: 3 credits
- **ECET 15500** Digital Fundamentals II: 3 credits

Sophomore Year

Third Semester (17 credit hours)

- **ECET 20900** Intro to Microcontrollers: 4 credits
- **MATH 22100** Calculus for Tech I: 3 credits
- **ECET 15700** Electronics Circuit Analysis: 4credits
- **ECET 16400** Applied Object Oriented Programming: 3 credits
- **COMM-R 110** Fundamentals of Speech Communication: 3 credits

Fourth Semester (14 credit hours)

- **MATH 22200** Calculus for Tech II: 3 credits
- **ECET 28400** Computer Communications: 4 credits
- **CIT 28600** Operating Systems and Administration: 3 credits
- **PHYS 21800** General Physics I: 4 credits

Junior Year

Fifth Semester (15 credit hours)

- **ECET 35700** Real-Time Digital Signal Processing: 4 credits
- **Gen Ed Elective** See approved course list: 3 credits
- **ECET 23100** Electrical Power & Controls: 4 credits
- **ECET Elective**: 4 credits

Sixth Semester (17 credit hours)

- **ECET Elective**: 4 credits
- **ECET Elective**: 4 credits
- **CIT 27000** Java Programming: 3 credits
- **TCM 37000** Oral Practicum: 3 credits
- **OLS 26300** Ethical Decisions in Leadership: 3 credits

Senior Year

Seventh Semester (14 credit hours)

- **ECET Elective**: 4 credits
- **ECET 49000** Senior Design Project Phase I: 1 credit
- **CIT 21400**:Introduction to Data Management 3 credits
- **STAT Selective** See approved course list: 3 credits
- **Gen Ed** Elective: 3 credits

Eighth Semester (16 credit hours)

- **ECET 49100** Senior Design Project Phase II: 2 credits
- **ECET Elective**: 4 credits
- **CIT Selective***: 3 credits
- **ECET Elective**: 4 credits
- **Gen Ed Elective**: 3 credits

Construction Engineering Management Technology

Professor T. Iseley (Program Director), E. Sener
Assistant Professor B. Kinsey, D. Koo
Lecturer Bill White

The Construction Engineering Management Technology program offers students in the program a B.S. degree. Students may apply to enter the co-op or internship work programs following their freshman year.

For more information, contact the Department of Engineering Technology at (317) 274-2363 or email aland@iupui.edu. or visit our Web site at http://engr.iupui.edu/cemt/index.shtml?menu=home.

Bachelor of Science in Construction Engineering Management Technology

Accredited by the Engineering Technology Accreditation Commission (ETAC), of ABET http://www.abet.org.

The Construction Engineering Management Technology curriculum is intended to further students' knowledge in areas of construction contract administration, specification writing, construction field operations, construction scheduling/project control, construction costs and bidding, construction law and ethics, construction safety and inspection, construction project cost and project control, soils and foundations, construction economics, and construction management through further course work. Additional course work in microeconomics, mathematics, lab sciences, and training in written and oral communications is also included. Many students complete all or part of their course work on a part-time basis by taking a reduced course load during the semesters they are engaged in construction-related employment.

Graduates of the program are prepared for employment with contractors, building product companies, consulting engineering firms, construction material and equipment vendors, testing labs, utilities, and state and other government organizations. Occupations such as inspecting, estimating, project management, merchandising, supervising, and testing may also be filled by graduates of this program.

Program Educational Objectives in Construction Engineering Management Technology

The Program Educational Objectives reflect career and professional accomplishments of the program's graduates a few years after graduation. They are as follows:

1. Successfully support, manage or administer construction related operations.
2. Receive professional recognition / advancement consistent with the awarded degree.
3. Demonstrate continued interest in professional growth.

Graduates typically find employment with engineering firms, construction firms, consulting companies, surveying companies, contractors and subcontractors, builders, construction materials testing companies, building products, materials and equipment suppliers, land developers, highway departments, utilities, and various state, city, and governmental agencies and work with titles such as project manager or project supervisor, contract administrator, specifications writer, safety supervisor, project estimator, project scheduler, contractor, sub-contractor, builder, surveyor, designer, remodeller, testing supervisor, merchandiser of construction materials and equipment.

The curriculum is not intended to prepare students for registration as professional engineers.

Freshman Year

First Semester (16 credit hours)

- **TECH 10200** Discovering Technology:1 credit hours
- **TECH 10400**: Technical Graphics Communication: 3 credit hours

- **TECH 10500**: Introduction to Engineering Technology: 3 credit hours
- **CEMT 12000**: Construction Materials and Methods: 3 credit hours
- **ENG W131** Elementary Composition I: 3 credit hours
- **MATH 15300** Algebra and Trigonometry I: 3 credit hours

Second Semester (15 credit hours)

- **OLS Selective:** OLS 25200 or OLS 27400: 3 credit hours
- **CEMT 27500** Civil Eng Drafting: 3 credit hours
- **COMM R110** Fundamentals of Speech Communication: 3 credit hours
- **MATH 15400** Algebra and Trigonometry II: 3 credit hours
- **TCM 22000** Technical Report Writing: 3 credit hours

Sophomore Year

Third Semester (17 credit hours)

- **CEMT 21500** Constr Mech & Elec: 4 credit hours
- **CEMT 11000** Construction Accounting: 3 credit hours
- **TCM 34000** Correspondence in Bus & Ind: 3 credit hours
- **ECON E201** Microeconomics: 3 credit hours
- **PHYS 218** General Physics I: 4 credit hours

Fourth Semester (15 credit hours)

- **Gen Ed Elective**: 3 credit hours
- **CEMT 28000** Quantity Survey: 3 credit hours
- **CEMT 10400** Surveying Fundamentals: 3 credit hours
- **CEMT 16000** Statics: 3 credit hours
- **MATH 22100** Calculus for Technology I: 3 credit hours

Junior Year

Fifth Semester (14 credit hours)

- **CEMT 30200** Construction Law & Ethics: 3 credit hours
- **CEMT 34200** Construction Cost & Bidding: 3 credit hours
- **CEMT 31200** Construction Surveying: 3 credit hours
- **CEMT 26000** Strength of Materials: 3 credit hours
- **CEMT 26700** Materials Testing: 2 credit hours

Sixth Semester (16 credit hours)

- **CEMT 34700** Constr. Contract Admin & Specs: 3 credit hours
- **CEMT 34100** Construction Scheduling: 3 credit hours
- **CEMT 48400** Wood, Timber and Formwork Design: 3 credit hours
- **Science Elective:** 4 credit hours
- **Math/Stat/Phys/.Elective:** 3 credit hours

Senior Year

Seventh Semester (16 credit hours)

- **CEMT 45200** Hydraulics and Drainage: 3 credit hours
- **CEMT 33000** Construction Field Operations: 3 credit hours
- **CEMT 45500** Constr. Safety & Inspection: 3 credit hours
- **CEMT 48600** Reinfor Concrete Des & Const: 3 credit hours
- **Gen Ed Elective**: See approved course list: 3 credit hours
- **CEMT 39000** Construction Experience: 1 credit hours

Eighth Semester (15 credit hours)

- **CEMT 43000** Soils and Foundations: 3 credit hours
- **CEMT 49400** Engineering Economics for Construction: 3 credit hours
- **CEMT 44700** Project Management: 3 credit hours
- **CEMT 35000** Constr. Proj. Cost & Proj. Cntrl: 3 credit hours
- **Construction Elective:** 3 credit hours

Construction Management Certificate

This certificate is designed to provide educational opportunities for those who need or desire to learn contemporary construction management techniques and skills and employ the latest technology in doing so. This program emphasizes developing the skills required by the construction industry and relies on the use of computers, whenever possible, to provide a contemporary education in the use of the latest technology in the management process. Those who earn the certificate will qualify for entry-level positions as superintendents, project managers, estimators, or schedulers for construction-related firms and will be competent in using the latest technology.

Good candidates for the program are people who wish to acquire additional marketable skills in construction management, who wish to upgrade existing construction management skills, or who wish to earn tangible verification of acquired skills and bodies of knowledge related to construction management.

Curriculum (27 credit hours)

- **CEMT 11000** Construction Accounting: 3 credit hours
- **CEMT 28000** Quantity Survey: 3 credit hours
- **CEMT 33000** Construction Field Operations: 3 credit hours
- **CEMT 34100** Construction Scheduling and Project Control: 3 credit hours
- **CEMT 34200** Construction Cost and Bidding: 3 credit hours
- **CEMT 34700** Construction Contract Administration and Specifications: 3 credit hours
- **CEMT 44700** Construction Project Management: 3 credit hours
- **CEMT 45500** Construction Safety and Inspection: 3 credit hours
- **CEMT 49400** Engr Economics for Construction: 3 credit hours

Any student who has 8 credit hours in college-level technical mathematics, including algebra, trigonometry, and calculus; proven computer competency; the ability to read and interpret construction documents; and is formally admitted to the university, may be a candidate for this certificate. Courses taken at other universities may be recognized as equivalent to selected required courses. Course credit may be given for appropriate job experience.

Courses taken at other universities may be recognized as equivalent to selected required courses, as corequisites, or as prerequisites, and course credit may be given for appropriate job experience. Please see the department chair before starting this certificate to obtain the full certificate requirements and the flowchart for the certificate program of study, there may be other course requirements that circumstances may necessitate. Students pursuing a degree cannot be awarded a certificate.

Electrical Engineering Technology

Professors E. Cooney*(Chair)*
Clinical Associate Professor W.Lin
Assistant Professors Afshin Izadian, David Goodman

Bachelor of Science in Electrical Engineering Technology

Accredited by the Engineering Technology Accreditation Commission (ETAC) of ABE, http://www.abet.org.

Graduates of this program are qualified for high-level positions as technologists with job titles such as product engineer, process automation specialist, quality engineer, audio engineer, manufacturing system integration engineer, product engineer, field service engineer, substation engineer, controls engineer, calibration specialist, and sales engineer. The courses are offered both in the day and evening.

Program Educational Objectives for Electrical Engineering Technology

Three to five years after graduation, alumni of the Electrical Engineering Technology program at IUPUI will be able to:

1. Meet expectations of employers in technical and professional careers related to the field of Electrical Engineering Technology.
2. Achieve recognition and/or advancement consistent with their education.
3. Continue growth in professional knowledge through additional education, certification or licensing.

First Semester (16 credit hours)

- **TECH 10200** Discovering Technology: 1 credit hour
- **TECH 10400** Technical Graphics Communication: 3 credit hours
- **TECH 10500** Introduction to Engineering Technology: 3 credit hours
- **ECET 10900** Digital Fundamentals: 3 credit hours
- **MATH 15300** Algebra and Trigonometry I: 3 credit hours
- **ENG W131** Elementary Composition I: 3 credit hours

Second Semester (16 credit hours)

- **ECET 10700** Introduction to Circuit Analysis: 4 credit hours
- **ECET 15500** Digital Fundamentals II: 3 credit hours
- **TCM 22000** Technical Report Writing: 3 credit hours
- **MATH 15400** Algebra and Trigonometry II: 3 credit hours
- **Gen Ed Elective** See approved course list: 3 credit hours

Sophomore Year

Third Semester (16 credit hours)

- **ECET 15700 Electronics Circuit Analysis: 4 credit hours**
- **ECET 16400 Applied Object Oreinted Programming: 3 credit hours**
- **STAT Selective See approved course list: 3 credit hours**
- **MATH 22100 Calculus for Tech I: 3 credit hours**
- **COMM-R 110 Fundamentals of Speech Communication : 3 credit hours**

Fourth Semester (17 credit hours)

- **ECET 20700 AC Electronics Circuit Analysis: 4 credit hours**
- **ECET 28400 Computer Communications: 4 credit hours**
- **MATH 22200 Calculus for Tech II: 3 credit hours**
- **Gen Ed Elective See approved course list: 3 credit hours**
- **Tech Elective: See Approved course list: 3 credit hours**

Junior Year

Fifth Semester (15 credit hours)

- **ECET 20900 Introduction to Microprocessors: 4 credit hours**
- **ECET 23100 Electrical Power and Controls: 4 credit hours**
- **PHYS 21800 General Physics: 4 credit hours**
- **Technical Elective: see approved course list**
- **ECET Elective: 4 credit hours**
- **ECET Elective: 4 credit hours**
- **ECET 30700 Analog Network Signal Processing: 4 credit hours**
- **TCM 37000 Oral Practicum for Technology: 3 credit hours**

Senior Year

- **ECET Elective: 4 credit hours**
- **ECET 49000 Senior Design Project Phase I: 1 credit hour**
- **TECH Elective See approved course list: 3 credit hours**
- **CHEM C101 Elementary Chemistry I LEC: 3 credit hours**
- **CHEM C121 Elementary Chemistry I LAB: 2 credit hours**
- **Gen Ed Elective See approved course list: 3 credit hours**
- **ECET Elective: 4 credit hours**
- **ECET Elective: 4 credit hours**
- **ECET 49100 Senior Design Project Phase II: 2 credit hours**
- **OLS 26300 Ethical Decisions in Leadership: 3 credit hours**

- **TECH Elective See approved course list: 3 credit hours**

Minor in Electrical Engineering Technology
The minor in electrical engineering technology (EET) requires completion of a minimum of 22 credit hours of ECET courses. Required courses are ECET 107, 109, 157, 155, and 207. In addition, one course from the following list must be completed: ECET 209, 231 or 284 . At least 12 credit hours of minor must be completed in residence at IUPUI. Students with credit for ECET 116 should consult the ECET department.

Students who wish to complete a minor in electrical engineering technology should consult a department advisor about prerequisite courses or credit for courses taken at other universities.

Mechanical Engineering Technology

Associate Professors: D. Acheson, K. Rennels, P. Hylton, R. Chen
Assistant Clinical professor: P Yearling (Program Director)
Lecturer: R. Durkin, L. Silvian

The Department of Engineering Technology offers a Bachelor of Science degree in mechanical engineering technology. The short-duration certificate programs are offered in quality assurance and motorsports technology.

For more information, contact the Department of Engineering Technology at (317) 274-3428, or email aland@iupui.edu , or visit our Web site at: www.engr.iupui.edu/met.

Bachelor of Science in Mechanical Engineering Technology

Accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET. http://www.abet.org

This program is designed to satisfy a specific need of industry. Building on the A.S. background, selected practical and applied courses give students additional communicative and supervisory skills, interdisciplinary technical understanding, and greater expertise in their major area.

Program Educational Objectives for Mechanical Engineering Technology

Three to five years after graduation, alumni of the Mechanical Engineering Technology Program at IUPUI will be able to:

1. Work competently in technical and professional careers related to the field of Mechanical Engineering Technology.
2. Achieve recognition and/or advancement consistent with their education.
3. Continue growth in professional knowledge through additional education, certification, or licensing.

Freshman Year

First Semester (16 credit hours)

- **TECH 10200:** Technology Learning Community: 1 credit hour
- **TECH 10400**: Technical Graphics Communication: 3 credit hours
- **TECH 10500**: Introduction to Engineering Technology: 3 credit hours
- **IET 10400**: Industrial Organization: 3 credit hours
- **MATH 15300:** Algebra and Trigonometry I: 3 credit hours
- **ENG W131**: Elementary Composition I: 3 credit hours

Second Semester (17 credit hours)

- **MET 11100:** Applied Statics: 3 credit hours
- **MET 20400**: Introduction to Design: 3 credit hours
- **CHEM C101**: Elementary Chemistry I: 3 credit hours
- **CHEM C121:** Elementary Chemistry Laboratory I: 2 credit hours
- **TCM 22000**: Technical Report Writing: 3 credit hours
- **MATH 15400:** Algebra and Trigonometry II: 3 credit hours

Sophomore Year

Third Semester (17 credit hours)

- **MET 21100:** Applied Strength of Materials: 4 credit hours
- **MET 21300**: Dynamics: 3 credit hours
- **COMM R110:** Fundamentals of Speech Communication: 3 credit hours
- **PHYS 21800**: General Physics I: 4 credit hours
- **MATH 22100**: Calculus for Technology I: 3 credit hours

Fourth Semester (16 credit hours)

- **MET 21400**: Machine Elements: 3 credit hours
- **MET 22000**: Heat/Power: 3 credit hours
- **MET 23000**: Fluid Power: 3 credit hours
- **PHYS 21900**: General Physics II: 4 credit hours
- **MATH 222**: Calculus for Technology II: 3 credit hours

Junior Year

Fifth Semester (17 credit hours)

- **MET 32000 or MET 37000:** 3 credit hours
- **IET 15000:** Quantitative Methods for Technology: 3 credit hours
- **MET 32800**: CAD/CAM for Mechanical Design: 3 credit hours
- **MET 33800**: Manufacturing Processes: 4 credit hours
- **MET 34800**: Engineering Materials: 4 credit hours

Sixth Semester (16 credit hours)

- **MET 31000:** Computer-Aided Machine Design: 3 credit hours
- **MET 35000**: Applied Fluid Mechanics: 3 credit hours
- **ECET 16400:** Object Oriented Programming: 3 credit hours
- **IET 35000**: Engineering Economics: 3 credit hours
- **ECET 11600:** Electrical Circuits: 4 credit hours

Senior Year

Seventh Semester (16 credit hours)

- **ECET 35100:** Instrumentation and Controls: 4 credit hours

- **Gen Ed Elective:** See approved course list: 3 credit hours
- **Gen Ed Elective**: See approved course list: 3 credit hours
- **Technical Elective:** See approved course list: 3 credit hours
- **Technical Elective**: See approved course list: 3 credit hours

Eighth Semester (12 credit hours)

- **MET 41400**: Design of Mechanical Projects: 3 credit hours
- **OLS 26300**: Ethical Decisions in Leadership: 3 credit hours
- **Gen Ed Elective:** See approved course list: 3 credit hours
- T**echnical Elective:** See approved course list: 3 credit hours

Quality Assurance Certificate Program

Developed in conjunction with the Northeast Indiana Section of the American Society for Quality Control, this certificate program provides training and instruction in the use of measuring instruments and techniques of statistical quality control. The course work provides a basis for putting these techniques to work in the quality control system of an industrial organization. The program includes an investigation of the concept of quality control and the impact of quality costs, determination of customer needs, and follow-up on field performance and feedback. A certificate will be presented to those who successfully complete all course work and the transcript noted.

A total of 20 credit hours and cumulative grade point average of 2.0 on a 4.0 scale is required to receive the certificate.

All students must complete the following courses:

The courses are listed in the order in which they should be taken.

Curriculum (23 credit hours)

- MATH 15100 or MATH 15300/15400 Algebra and Trigonometry: 5 credit hours
- MET 10500 Intro to Engineering Technology: 3 credit hours
- IET 30000 Metrology for Quality Assurance: 3 credit hours
- IET 15000 Quantitative Methods for Technology: 3 credit hours
- IET 36400 Total Quality Control: 3 credit hours
- IET 37400 Nondestructive Testing or
- IET 47400 Quality Improvement of Products and Processes: 3 credit hours
- IET 45400 Statistical Quality Control: 3 credit hours

Motorsports Engineering

Associate Professor P. Hylton *(Program Director)*
Lecturer S. Raymond

IUPUI is the first University in the United States to offer a bachelor's degree in motorsports engineering

The motorsports industry is growing and expected to continue to grow at a rapid pace. By most accounts, Indiana, North Carolina, and England are recognized as the three leading local motorsports economies. Indianapolis, while generally known as the home of open-wheel racing has a broad appeal. It is also known for sprint cars, midgets, karting, NHRA, and many other forms of racing. It is estimated that there are over 400 motorsports-related firms in the Indianapolis region including companies that produce engines, brakes, shocks, springs, and other racing products.

Bachelor of Science in Motorsports Engineering

This 4-year Bachelor of Science of Degree in Motorsports Engineering degree program was just approved in May, 2008. This program, which aims to prepare graduates for careers in the motorsports industry, as well as automotive-related companies, will focus on teaching fundamentals of engineering and will include hands-on projects that involve designing, analyzing, and building of actual systems.

Freshman Year

First Semester (17 credit hours)

- ENG-W 131 - Elementary Composition: 3 credit hours
- Math 16500 - Calculus I: 4 credit hours
- ENGR 19500 - Learning Community: 1 credit hour
- CHEM C 10500 - Chemistry II: 3 credit hours
- MSTE 27200 - Intro to Motorsports: 3 credit hours
- Comm-R 110 - Fundamentals of Speech Communication

Second Semester (17 credit hours)

- MSTE 31200 - Business of Motorsporst: 4 credit hours
- MATH 16600 - Calculus II: 4 credit hours
- PHYS 15200 - General Physics I: 4 credit hours
- MSTE 29800 - Computer Modeling & Programming: 2 credit hours
- MATH 17100 - Multidimensional Math: 3 credit hours

Sophomore Year

Third Semester (17 credit hours)

- MSTE 26100 - Multivariate Calculus: 4 credit hours
- PHYS 25100 - General Physics II: 5 credit hours
- MSTE 35000 - Computer Aided Design and Mfg: 3 credit hours
- MSTE 21000 - Statics and Dynamics: 4 credit hours
- MSTE 21700 - Motorsports Practicum I: 1 credit hour

Fourth Semester (17 credit hours)

- MET 33800 - Manufacturing Processes: 3 credit hours
- ECE 20400 - Electrical & Electronics Circuits: 4 credit hours
- ME 27200 - Strength of Materials: 4 credit hours
- MSTE 32000 - Motorsports Design I: 3 credit hours
- ME 32000 - Thermodynamics: 3 credit hours

Junior Year

Fifth Semester (14 credit hours)

- MSTE 47200 - Vehicle Dynamics: 3 credit hours

- MSTE 33000 - Data Acquisition in Motorsports I: 3 credit hours
- MATH 26600 - Ordinary Diff. Equations: 3 credit hours
- ME 31000 - Fluid Mechanics: 4 credit hours
- MSTE 31700 - Motorsports Practiucm II: 1 credit hours

Sixth Semester (15 credit hours)

- MSTE I 4100 - Internship: 1 credit hour
- MSTE 33100 - Data acquisition in Motorsports II: 3 credit hours
- MSTE 3400 - Dynamic Systems and Signals: 3 credit hours
- IET 15000 - Statics: 3 credit hours
- ME 34400 - Materials: 3 credit hours
- TCM 36000 - Communications/Writing: 2 credit hours

Senior Year

Seventh Semester (18 credit hours)

- MSTE 48200 - Motorsports Aero: 3 credit hours
- ME 48200 - Control Systems Analysis and Des.: 3 credit hours
- Gen Ed Elective - See approved course list: 3 credit hours
- Technical Selective - See approved course list: 8 credit hours
- MSTE 41700 - Motorsports Practicum III: 1 credit hour

Eighth Semester (13 credit hours)

- ME 40100 - Ethics: 1 credit hour
- MSTE 41400 - Motorsports Design II: 3 credit hours
- MSTE 42600 - Internal Combustion Engines: 3 credit hours
- Tech Elective - See approved course list: 3 credit hours
- Gen Ed Elective - See approved course list: 3 credit hours

Motorsports Engineering Certificate

This certificate provides an educational opportunity in the basics of the motorsports industry. Motorsports is a rapidly expanding segment of the Indiana employment market. This certificate will assist in developing technical skills in this area. A certificate and transcript notation will be awarded upon completion of the course work.

A total of 27 credit hours and a cumulative grade point average of 2.0 on a 4.0 scale is required to receive the certificate

All students must complete the following courses or their equivalents:

- MATH 15900 - Algebra & Trigonometry or Math 153/154 Algebra & Trigonometry I&II: 5 credit hours
- MET 11100 - Statics: 3 credit hours
- MET 21300 - Dynamics: 3 credit hours
- MET 38800 - Thermodynamics & Heat and Power: 4 credit hours
- MET 27200 - Intro to Motorsports: 3 credit hours
- MSTE 42600 - IC Engines: 3 credit hours
- MET 47200 - Vehicle Dynamics: 3 credit hours
- An MET Project Course with a Motorsports related project: 3 credit hours
- (may be MET 41400, MET 49700 or MET 29900 project course)

Sustainable Technologies Certificate

Purpose

In the United States, sustainability has gained importance in business, industry, government, government agencies, higher education, and in the general public's consciousness. The goal of meeting today's needs without harming future generations' ability to realize their potential is a hallmark of sustainable practices, and there is widespread interest from many disciplines and sectors in developing, enhancing, and integrating sustainability into aspects of products, services, and solutions. Thus, the need to equp students with the knowledge, skills, and perspectives to make contributions tosustainability initiatives has never been greater. Green jobs are rapidly being created as the economy begins enbracing sustainable, energy efficiency, and low-carbon practices. The driving forces behind the development of green jobs are businesses wishing to maintain cutting edge technology, become more energy efficient, while lowering their carbon foot print, or becoming entirely carbon neutral. The governments of the world, the U.S. being one of them, support these developments through initiatives including: federal funding, subsidies, tax reform, and carbon markets. This certificate is designed to address a growing need for professionals who can contribute to the green global workforce with knowledge in sustainable practices in current technologies. The Sustainable Technologies Certificate will be beneficial to students who want to acquire knowledge in areas of renewable energies, green building, and sustainable design, and who may want to pursue a career in a sustainable technology. All of the Sustainable Technologies Certificate courses will be offered online.

Admission

Candidates for this certificate are required to be formally admitted by the IUPUI Office of Admissions, but not required to be a student in the Purdue School of Engineering Technology. To earn the Sustainable Technologies Certificate, or any other certificates, students must contact the department to complete paperwork to add the certificate to their program plan of study before they enroll in the last semester or sooner. Applications for graduation must be completed one semester prior to completion of the required curriculum.

Curriculum (18 credit hours)

Students are required to successfully complete a total of 6 courses (18 credit hours) to earn the certificate. No more than 6.0 units of transfer credit can be applied towards this certificate. All students must successfully complete all of the following required core courses:

- OLS 39900 (TECH 20100) Introduction to Sustainable Principles and Practices - 3 credit hours
- ECET 49900 (TECH 30100) Renewable Energy Technologies* - 3 credit hours
- ART 29900 (TECH 30200) Introduction to Green Building Technologies*[1] or

- ART 29900 (TECH 30400) Green Building: Information Modeling[1] - 3 credit hours
- ECET 49900 (TECH 30300) Energy Efficiency and Auditing - 3 credit hours
- ECET 49900 (TECH 40200)Emerging Green Technologies* - 3 credit hours

* SPEA Students will be taking these courses.

[1] For the certificate students choose just one of these courses.

Mechanical Engineering (ME)

Professors J. Chen *(Chair),* R. Nalim, N. Paydar
Associate Professors H. El-Mounayri, S. Anwar, T. Wasfy, T. Katona, A. Jones
Assistant Professors J. Xie, L. Zhu, Y. Kim, H. Yu, J. Zhang, A. Tovar
Lecturers A Razban

The Department of Mechanical Engineering offers programs at the bachelor's, master's, and doctoral levels. At the bachelor's level, programs described here lead to the Bachelor of Science in Mechanical Engineering (B.S.M.E.), the Bachelor of Science in Energy Engineering (B.S.E.E.N.), and the Bachelor of Science in Engineering (B.S.E.), an interdisciplinary degree. Students enrolled in the department study under faculty actively engaged in research in a variety of areas: advanced materials, biomechanics, combustion, composites, computational fluid dynamics, computer-aided design, control, experimental mechanics, fluid mechanics, finite element methods, fracture, heat transfer, manufacturing, renewable energy, battery technology, fuel cell technology, mechatronics, hybrid electric vehicles technology, robotics, solid and structural mechanics, turbomachinery, and vibration. For more information, contact the Department of Mechanical Engineering at (317) 274-9717 or visit the Department's website at **www.engr.iupui.edu/me.**

B.S. in Mechanical Engineering

The B.S.M.E. Program is accredited by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202, (410) 347-7700.

Mechanical engineering has its foundation in the basic sciences, including mathematics, physics, and chemistry, and requires an understanding of such areas as solid and fluid mechanics, materials, thermodynamics, heat and mass transfer, manufacturing processes, instrumentation, and control. Mechanical engineers are engaged in a variety of activities including design, manufacturing, research, development, testing, construction, operations, sales, management, consulting, and teaching.

The mechanical engineering curriculum provides a broad base on which to build an engineering career. Traditional subjects in mechanical engineering are complemented by extensive computer experience in such areas as computer-aided design and numerical problem solving. The program's flexibility allows students to specialize in their area of interest through choosing electives. Part-time employment is available to students in the research laboratories of the department. Such experience enhances course work and is particularly valuable to those who later undertake graduate study.

The Mechanical Engineering Program Educational Objectives are:

1. Serve as competent mechanical engineering professionals that meet or exceed the expectations of their employers.

2. Pursue advanced degrees in Mechanical or other related fields of engineering. Pursue other professional degrees, such as law or business.

3. Assume leadership roles in government and industry, as well as in their communities and the global society.

The number of credit hours required for graduation is 130, distributed as follows for each discipline:
1. Mathematics and Physical Sciences

- Calculus: **MATH 16500**, **16600**, **26100:** 12 credit hours
- Multidimensional Mathematics: **MATH 17100:** 3 credit hours
- Differential Equations: **MATH 26600:** 3 credit hours
- Chemistry: **CHEM-C 105:** 3 credit hours
- Physics: **PHYS 15200** and **25100:** 9 credit hours
- Science/TECH Elective (also listed under Technical Electives): 3 credit hours

2. Communications, Ethics and Contemporary Issues

- Speech: **COMM-R 110:** 3 credit hours
- Writing: **ENG-W 131:** 3 credit hours
- Communication in Engineering Practice: **TCM 36000:** 2 credit hours
- Engineering Ethics and Professionalism: **ME 40100:** 1 credit hour
- Seminar & Fundamentals of Engineering Review: **ME 40500:** 1 credit hour

3. General Education

- Engineering Economics: **ME 32700:** 3 credit hours
- Electives: 12 credit hours
- Free Elective 3 credit hours

4. Freshman Engineering Courses

- Introduction to the Engineering Profession: **ENGR 19500:** 1 credit hour
- Introduction to Engineering: **ENGR 19600: 3 credit hours**
- Introduction to Programming Concepts: **ENGR 19700: 2 credit hours**
- Computer Tools for Engineering: **ENGR 29700: 3 credit hours**

5. Mechanics and Materials

- Mechanics: **ME 27000** and **ME 27400: 6 credit hours**
- Materials: **ME 27200** and **ME 34400: 7 credit hours**

6. Design

- Mechanical Design: **ME 26200** and **37200: 7 credit hours**
- Capstone Design: **ME 46200: 3 credit hours**

- Thermal-Fluid Systems Design: **ME 41400: 3 credit hours**

7. Thermal-Fluid Sciences

- Thermodynamics: **ME 20000: 3 credit hours**
- Fluid Mechanics: **ME 31000: 4 credit hours**
- Heat and Mass Transfer: **ME 31400: 4 credit hours**

8. Electrical Engineering, Instrumentation and Control

- Electrical Engineering: **ECE 20400: 4 credit hours**
- Systems, Measurements and Controls: **ME 33000**, **34000**, and **48200: 9 credit hours**

9. Technical Electives

- TECH Electives: 9 credit hours
- Statistics Elective: 3 credit hours
- Science/TECH Elective (also listed under Mathematics and Physical Sciences): 3 credit hours

Semester by semester, the **130 total credit hours** are distributed as follows:

Freshman Year

First Semester (14 credit hours)

- **ENGR 19500** Introduction to the Engineering Profession: 1 credit hours
- **ENGR 19600** Introduction to Engineering: 3 credit hours
- **CHEM-C 10500** Chemical Science I: 3 credit hours
- **COMM-R 110** Fundamentals of Speech Communication: 3 credit hours
- **MATH 16500** Analytic Geometry and Calculus I: 4 credit hours

Second Semester (16 credit hours)

- **ENGR 19700** Introduction to Programming Concepts: 2 credit hours
- **ENG-W 131** Elementary Composition I: 3 credit hours
- **MATH 16600** Analytic Geometry and Calculus II: 4 credit hours
- **PHYS 15200** Mechanics: 4 credit hours
- **MATH 17100** Multidimensional Mathematics: 3 credit hours

Sophomore Year

Third Semester (16 credit hours)

- **ENGR 29700** Computer Tools for Engineering: 1 credit hours
- **ME 20000** Thermodynamics I: 3 credit hours
- **ME 27000** Basic Mechanics I: 3 credit hours
- **MATH 26100** Multivariate Calculus: 4 credit hours
- **PHYS 25100** Heat, Electricity, and Optics: 5 credit hours

Fourth Semester (16 credit hours)

- **ME 32700** Engineering Economics: 3 credit hours
- **ME 26200** Mechanical Design I: 3 credit hours
- **ME 27400** Basic Mechanics II: 3 credit hours
- **ECE 20400** Introduction to Electrical and Electronic Circuits: 4 credit hours
- **MATH 26600** Ordinary Differential Equations: 3 credit hours

Junior Year

Fifth Semester (17 credt hours)

- **ME 27200** Mechanics of Materials: 4 credit hours
- **ME 33000** Modeling and Analysis of Dynamic Systems: 3 credit hours
- **ME 31000** Fluid Mechanics: 4 credit hours
- Statistics Elective: 3 credit hours
- General Education Elective: 3 credit hours

Sixth Semester (17 credit hours)

- **ME 34400** Introduction to Engineering Materials: 3 credit hours
- **ME 31400** Heat and Mass Transfer: 4 credit hours
- **ME 37200** Mechanical Design II: 4 credit hours
- **ME 34000** Dynamic Systems and Measurements: 3 credit hours
- General Education Elective: 3 credit hours

Senior Year

Seventh Semester (17 credit hours)

- **ME 41400** Thermal-Fluid Systems Design: 3 credit hours
- **ME 48200** Control Systems Analysis and Design: 3 credit hours
- **TCM 36000** Communication in Engineering Practice: 2 credit hours
- TECH **Elective:** 3 credit hours
- **General Education Elective:** 3 credit hours
- **General Education Elective: :** 3 credit hours

Eighth Semester (17 credit hours)

- **ME 40100** Engineering Ethics and Professionalism: 1 credit hour
- **ME 40500** FE Exam Preparation and Seminar: 1 credit hour
- **ME 46200** Capstone Design: 3 credit hours
- TECH Elective: 3 credit hours
- TECH Elective: 3 credit hours
- Free Elective: 3 credit hours

The complete list of Approved Electives for the B.S.M.E. curriculum may be found by clicking here.

B.S. in Energy Engineering

Energy Engineering at IUPUI is an interdisciplinary engineering degree housed in the Mechanical Engineering Department. It is a four-year Purdue University Bachelor's degree that is only offered on the IUPUI campus in Indianapolis, IN. For more details, visit the Energy Engineering website: http://engr.iupui.edu/energy/index.shtml.

We combine courses from chemistry, mechanical engineering, physics and electrical engineering to create a strong knowledge base essential to success in this industry.

Students also have the opportunity to take courses concentrating on critical energy issues such as green building, hybrid and electric transportation, fuel cells and bio fuels, and energy systems such as wind, solar and nuclear.

Whether entering the workforce directly or continuing on to further education, graduates of this program will leave equipped to tackle the exciting and meaningful challenges ahead on the energy horizon.

The Energy Engineering Program Educational Objectives are:

1. Serve as competent energy engineering professionals that meet or exceed the expectations of their employers.
2. Pursue advanced degrees in energy or other related fields of engineering. Pursue other professional degrees, such as law or business.
3. Assume leadership roles in government and industry, as well as in their communities and the global society.

Click here to view the Student Learning Outcomes for the B.S. in Energy Engineering.

Semester by semester, the **129 total credit hours** are distributed as follows:

Freshman Year

First Semester (17 credit hours)

- **ENGR 19500 -** Introduction to Engineering Profession (1 cr.)
- **ENGR 19600** - Introduction to Engineering (3 cr.)
- **MATH 16500** - Integrated Calculus and Analytic Geometry (4 cr.)
- **CHEM-C 105** - Chemical Science I (3 cr.)
- **COMM-R 110** - Fundamentals of Speech Communication (3 cr.)
- **ENG-W 131** - Elementary Composition I (3 cr.)

Second Semester (16 credit hours)

- **ENGR 19700** - Introduction to Programming Concepts (2 cr.)
- **MATH 17100** - Multidimensional Mathematics (3 cr.)
- **MATH 16600** - Integrated Calculus and Analytic Geometry II (4 cr.)
- **PHYS 15200** - Mechanics (4 cr.)
- **Gen Ed Elec** - General Education Elective (3 cr.)

Sophomore Year

Third Semester (17 credit hours)

- **ENGR 29700** - Computer Tools for Engineering (1 cr.)
- **MATH 26100** - Multivariate Calculus (4 cr.)
- **PHYS 25100** - Heat, Electricity, and Optics (5 cr.)
- **EEN 22000** - Fundamentals of Electrochemical Materials & Energy Engineering (4 cr.)
- **ME 20000** - Thermodynamics I (3 cr.)

Fourth Semester (17 credit hours)

- **ECE 20400** - Introduction to Electrical and Electronic Circuits (4 cr.)
- **MATH 26600** - Differential Equations (3 cr.)
- **EEN 24000** - Basic Mechanics (4 cr.)
- **EEN 26000** - Sustainable Energy (3 cr.)
- **ME 32700** - Engineering Economics (3 cr.)

Junior Year

Fifth Semester (16 credt hours)

- **ECE 49500** - Fundamentals of Electrical Energy Engineering (3 cr.)
- **EEN 33000** - Dynamic Systems Modeling and Measurements (4 cr.)
- **ME 27200** - Strength of Materials (4 cr.)
- **EEN 31000** - Fluid Mechanics and Heat Transfer (5 cr.)

Sixth Semester (15 credit hours)

- **ECE 32100** - Electromechanical Motion Devices (3 cr.)
- **EEN 33500** - Electric Power Networks and Interfaces (3 cr.)
- **EEN 34500** - Renewable Energy Systems and Design (3 cr.)
- **EEN ELEC** - Energy System Elective (3 cr.)
- **GEN ED ELEC** - General Education Elective (3 cr.)

Senior Year

Seventh Semester (17 credit hours)

- **EEN 41000** - Clean Power Generation (3 cr.)
- **ME 48200/ECE 38200** - Control Systems Analysis and Design (3 cr.)
- **EEN ELEC** - Energy Systems Elective (3 cr.)
- **EEN ELEC** - Energy Systems Elective (3 cr.)
- **TECH ELEC** - Technical Elective (3 cr.)
- **TCM 36000** - Communication in Engineering Practice (2 cr.)

Eighth Semester (14 credit hours)

- **ME 40500** - FE Preparation and Seminar (1 cr.)
- **ME 46200/EEN 46200** - Capstone Design (3 cr.)
- **ME 40100** - Engineering Ethics and Professionalism (1 cr.)
- **TECH ELEC** - Technical Elective (3 cr.)
- **EEN ELEC** - Energy Systems Elective (3 cr.)
- **GEN ED ELEC** - General Education Elective (3 cr.)

Electives

Energy Systems Electives
* 3 cr. Unless noted otherwise

ECE 49500 - Electronic Fundamentals of hybrid and Electric Vehicles
ECE 59500 - Modeling, Analysis and Control of Electric and Hybrid Vehicles
ECE 59500 - Energy Systems
ME 50400 - Automotive Control
ME 49700 - Powertrain Integration
ME 59700/EEN 4xx00 - Renewable Energy and Fuel Cells

EEN 3xx00 - Thermal and Hydro Generation (*Under Development*)
EEN 3xx00 - Wind and Solar Generation (*Under Development*)

EEN 3xx00 - Hybrid & Electric Transportation (*Under Development*)
EEN 3xx00 - Energy Storage Devices and Systems (*Under Development*)
EEN 3xx00 - Power Electronics (*Under Development*)

EEN 4xx00 - Fuel Cell & Battery Engineering (*Under Development*)
EEn 4xx00 - Nuclear Power Systems (*Under Development*)
EEN 4xx00 - Power train Modeling and Simulation (*Under Development*)

EEN xxx00 - Energy Systems Instrumentation (*Under Development*)
EEN xxx00 - Bio-fuels Extraction & Conversion (*Under Development*)
EEN xxx00 - Fuel Reforming & Reactor Design (*Under Development*)
EEN xxx00 - Materials for Energy Conversion (*Under Development*)
EEN xxx00 - Geothermal HVAC (*Under Development*)
EEN xxx00 - Zero and Lew-Energy Building Design (*Under Development*)

Technical Electives

**3 cr. unless noted otherwise*

ME 34400 - Introduction to Engineering Materials
ME 37200 - Mechanical Design II

ME 41800 - Heating and Air-Conditioning Analysis and Design
ME 43000 - Power Engineering
ECE 43200 - Power System I
ME 43300 - Principles of Turbomachinery
ME 44600 - CAD/CAM Theory and Applications
ME 45000 - Computer-Aided Engineering Analysis
ME 45100 - Computational Methods in Thermal Sciences
ME 45800 - Composite Materials
ME 47200 - Advanced Mechanics of Materials
ME 47400 - Vibration Analysis

ME 50500 - Intermediate Heat Transfer
ME 50900 - Intermediate Fluid Mechanics
ME 51000 - Gas Dynamics
ME 52500 - combustion
ME 55000 - Advanced Stress Analysis
ME 55100 - Finite Element Analysis
ME 55200 - Advanced Applications of Finite Element Methods
ME 56300 - Mechanical Vibrations
ME 56900 - Mechanical Behavior of Materials
ME 58100 - Numerical Methods in Mechanical Engineering
ME 59700 - Selected Topics in Mechanical Engineering

ENGR 20000, 25000, 30000, 35000, 40000 - Cooperative Education Practice I-V (1 cr each)
ENGR 20010, 25010, 30010, - Career Enrichment Internship I-III (1 cr each)
ECE - Power Electronics (*Under Development*)
ECET - Industrial Energy Systems Design (*Under Development*)

B.S. in Engineering - Interdisciplinary Engineering

Interdisciplinary engineering provides an opportunity for students whose interests and talents, while oriented toward engineering and science, do not coincide with the plan of study outlined for the B.S.M.E. student. Interdisciplinary engineering does not have a designated professional curriculum, but it is constituted to accommodate a degree objective with broad flexibility and opportunity for interdisciplinary studies.

Students cooperate with their faculty advisors to develop a personalized plan of study leading to the Bachelor of Science in Engineering (B.S.E.) degree with interdisciplinary engineering identified as the major field of study. The Department of Mechanical Engineering has prepared plans of study with such major program areas as Bioengineering, Structural Design, Construction Engineering Management and Engineering Management. The "Major Area" on a B.S.E. Plan of Study includes a minimum of 25 credit hours to complement at least 30 credit hours of Engineering Science/Design. At least 15 of the engineering credits must be at the 300 level or higher.

A description of the Engineering Management program follows as an example. For information about other available options, please consult faculty in the Department of Mechanical Engineering or visit the Department's Undergraduate Programs website.

B.S. in Engineering - Engineering Management

The School of Engineering and Technology and the Indiana University School of Business offer a joint program in engineering management. This program prepares students to begin careers that may lead to administrative or management positions in technological, engineering, or manufacturing operations. The program also prepares students for careers in large nontechnological organizations such as financial institutions, which may require skills generally associated with both engineering and business. The engineering management program provides a solid background in both engineering and management. To complete the graduation requirements, students take courses in electrical, industrial, and mechanical engineering, as well as accounting, business law, economics, finance, marketing, and management.

Students who finish this four-year degree have several options for continuing their education. With approximately three additional semesters of study, they can also complete an undergraduate program in industrial, electrical, or mechanical engineering. With approximately six additional undergraduate courses they can enroll in a master's degree program in industrial, electrical, or mechanical engineering. They may also apply for direct admission to law school. Students interested in any of these options for continued education should consult their advisors when determining their plans of study.

The number of credit hours required for graduation is 127, distributed as follows for each discipline:

1. Mathematics and Physical Sciences

- Calculus: MATH 16500, 16600, 26100: 12 credit hours

- Multidimensional Mathematics: MATH 17100: 3 credit hours
- Differential Equations: MATH 26600: 3 credit hours
- Chemistry: CHEM-C 10500: 3 credit hours
- Physics: PHYS 15200 and 25100: 9 credit hours

2. Communications, Ethics and Contemporary

- Speech: COMM-R 110: 3 credit hours
- Writing: ENG-W 131: 3 credit hours
- Communication in Engineering Practice: TCM 36000: 2 credit hours
- Engineering Ethics and Professionalism: ME 40100: 1 credit hour
- Seminar & Fundamentals of Engineering Review: ME 40500: 1 credit hours

3. General Education

- Electives: 12 credit hours

4. Freshman Engineering Courses

- Introduction to the Engineering Profession: ENGR 19500: 1 credit hour
- Introduction to Engineering: ENGR 19600: 1 credit hour
- Introduction to Programming Concepts: ENGR 19700: 2 credit hours
- Computer Tools for Engineering: ENGR 29700: 1 credit hour

5. Engineering Courses

- Electrical Engineering: ECE 20400 and 26600: 2 credit hours
- General Engineering: 9 credit hours
- Mechanical Engineering: ME 20000, 27000, 27200, 27400, and 33000: 16 credit hours
- Materials: ME 34400: 3 credit hours
- Design: ME 46200: 3 credit hours

6. Economics: ECON E201, E202: 6 credit hours

7. Business

- Accounting: A200: 3 credit hours
- Business Law: BUS L203: 3 credit hours
- Finance: BUS F300: 3 credit hours
- Management: BUS Z302: 3 credit hours
- Marketing: BUS M300: 3 credit hours
- Operations and System Management: BUS P300: 3 credit hours
- Computer: BUS K201: 3 credit hours
- Statistics: STAT 35000: 3 credit hours

Semester by semester, the **127 total credit hours** are distributed the same as the B.S.M.E. curriculum during the first two semesters, as shown below, and the student works with his or her advisor to make an individualized plan of study for the remaining semesters.

Freshman Year

First Semester

- **ENGR 19500** Introduction to the Engineering Profession: 1 credit hours
- **ENGR 19600** Introduction to Engineering: 3 credit hours
- **CHEM-C 10500** Chemical Science I: 3 credit hours
- **COMM-R 110** Fundamentals of Speech Communication: 3 credit hours
- **MATH 16500** Analytic Geometry and Calculus I: 4 credit hours

Second Semester

- **ENGR 19700** Introduction to Programming Concepts: 2 credit hours
- **ENG-W 131** Elementary Composition I: 3 credit hours
- **MATH 16600** Analytic Geometry and Calculus II: 4 credit hours
- **PHYS 15200** Mechanics: 4 credit hours
- **MATH 17100** Multidimensional Mathematics: 3 credit hours

NOTE: The Third through Eighth semesters are scheduled on an individual basis.

Graduate Programs in Mechanical Engineering

The Department of Mechanical Engineering has an outstanding and up-to-date engineering faculty with expertise and research interests in the areas of advanced manufacturing, biomechanics, composites, computational fluid dynamics, computer-aided design, computer-aided manufacturing, combustion, controls, elasticity, fluid mechanics, finite element analysis, fracture, heat transfer, renewable energy, mechatronics, advanced vehicle tech., battery, fuel, cell, robotics, solid and structural mechanics, stress analysis, and turbomachinery.

The department offers graduate programs of study that lead to the degrees of Master Science (M.S.), Master of Science in Engineering (M.S.E.), Master of Science in Mechanical Engineering (M.S.M.E.), and Ph.D. The program leading to the Ph.D. in mechanical engineering is jointly administered with the School of Mechanical Engineering at Purdue University, West Lafayette.

The department also offers combined bachelor's and master's degree programs, in which students can receive both B.S. and M.S. degrees in five years at IUPUI. These degree programs are open to qualified undergraduates at IUPUI, leading to either: 1) B.S. and M.S.M.E. degrees (B.S./M.S.M.E.) for mechanical engineering undergraduates, or 2) a B.S. degree in physics and an M.S. degree in mechanical engineering (B.P.M.M.E.) for physics undergraduates. The combined degrees prepare students for advanced engineering careers with two degrees (bachelor's and master's) in five years.

For more information about graduate programs visit http://engr.iupui.edu/me/bulletin/GraduatePrograms.shtml?menu=academics.

Music and Arts Technology (MAT)

Chair: Fred J. Rees, Professor of Music & Arts Technology

The Department of Music and Arts Technology reflects urban culture, contemporary and digital arts. Special courses on American popular music, contemporary music performance styles, music technology and music therapy are delivered

by innovative instructional technology. The department's technology facilities have captured national attention.

The Department of Music and Arts Technology is committed to delivering quality music instruction to the undergraduate and graduate students at the nation's premiere urban institution. Most undergraduate courses carry no prerequisites and are open to all students. Performance ensembles are open to students, staff, faculty, and community members.

Ensemble groups include the IUPUI Jazz Ensemble, IUPUI Jazz Combos, Pep Band, University Choir, IUPUI Percussion Ensemble, Guitar Ensemble, Steel DrumEnsemble, Afro-Cuban Percussion Ensemble, Chamber Ensemble, Telematic Performing Ensemble, and Laptop Orchestra.

This department awards degrees from Indiana University.

For more information, call or write: Department of Music and Arts Technology, IUPUI, 535 W. Michigan Street, Indianapolis, IN 46202, (317) 274-4000.

Web: music.iupui.edu

Undergraduate Programs

Music Minor

The Department of Music and Arts Technology welcomes students whose majors are outside the department, but who wish to minor in music. There is no audition required to minor in music, but students must declare music as their minor at the appropriate time in their undergraduate studies.

Music minors should participate in music ensembles within the Department of Music and Arts Technology and should register (or audition when required) for these ensembles during undergraduate orientation or the first week of class. The IUPUI Flute Choir, Jazz Ensemble, Pep Band, University Choir, Guitar Ensemble, and Urban Drum Experience are open to all students.

Music Minor in Musical Theatre

The Music Minor in Musical Theatre program (M.M.M.T.) is designed for students seeking to immerse themselves in the art of musical theatre.

This program provides opportunity in the creative process as well as becoming more in tune with the human experience.

Emphasis will be placed on performance that includes singing, acting (character development) and staging.

This course of study includes an annual performance open to family and friends.

Bachelor of Science in Music Technology

The Bachelor of Science in Music Technology degree is designed to provide professional training for students seeking careers that employ music technology. The program builds skills and knowledge common to the music industry and professional fields. The program is broad in scope and enables students to function effectively in the changing, contemporary musical world. It fosters leadership skills in the areas of creativity, entrepreneurship, self-reliance, and resourcefulness. The BSMT graduate will be able to adapt knowledge gained from this program to related disciplines beyond traditional music specializations. It will serve as a platform for students seeking the IUPUI Master of Science in Music Technology degree and will prepare graduates for advanced musical and technical study.

Overview

One hundred and thirty (130) hours of course work are required for this IU Degree. Students are engaged in making music with technology, performing, composing and producing digital music formatted materials. Students study musicianship during the first two years of the degree program, which combines music theory, history, keyboard and aural training. They participate in music ensembles and applied music lessons each semester of this four-year course of study.

Students also develop an outside concentration related to the degree. Examples might be in Business, Computer Technology, Informatics, Communication Studies, Mathematics, or Languages.

Admission Requirements

- High School Diploma
- SAT Scores
- Admittance into IUPUI: Bachelor's degree admission requirements
- TOEFL: a provisional minimum of 61+ (internet-based version/iBT), 173+ (computer-based version/CBT), or 500+ (paper-based version/PBT) http://www.toefl.org. You must request that official score reports be sent to IUPUI. Use school code 1325.
- Completed BSMT Application send to Department of Music and Arts Technology
- Audition
- Interview
- Basic Musical Skills Test
- Additional information may be requested to document musical skills or experience with technology.

Music Therapy Equivalency Program

The music therapy equivalency program is designed to assist students who already have an undergraduate degree in music in obtaining the needed competencies to become board-certified music therapists.

Admission Requirements

- Bachelor's degree in music from NASM-approved school
- Minimum grade point average of 3.0 (4.0 scale)
- Submission of a university and a department application
- Official transcripts of all college course work
- Evidence of musicianship through performance videotape, audio cassette, CD/DVD, or live audition
- Three letters of recommendation required tosupport the admission application
- In-person or telephone admission interview withthe music therapy faculty
- Non-native speakers must demonstrate English language proficiency with a minimum TOEFL score of 600/97. International students will also need to meet the application requirements of the IUPUI Office of International Affairs.

Admission Categories

Upon receipt of the completed application, letters of recommendation, transcript, evidence of musicianship, and the interview, the Graduate Admissions Committee of the IU Department of Music and Arts Technology at IUPUI may grant regular admission, grant admission on probation, or reject the application.

Admission on Probation

Students who do not have an undergraduate average of 3.0 or higher may be admitted on probation in exceptional cases. The probationary status continues until 9 credit hours of course work have been successfully completed. Students who are admitted on probation and incur academic probation during their first semester of study are subject to dismissal.

Program Requirements

Program requirements vary depending on the student's background and educational needs. The American Music Therapy Association and the Certification Board for Music Therapists have identified minimum competencies needed to become board certified as a music therapist. The faculty and student will determine which competencies have not been addressed during previous course work, this needs and strength analysis will determine the courses needed to meet the standards.

Minimum Grade Point Average

- 3.0 average to continue
- No grades lower than C in music therapy core courses are counted toward equivalency

Music Therapy Equivalency Curriculum

There are 22 credit hours of music therapy core courses and 7 credit hours of practicum courses (including internship) required for the equivalency program. In addition, courses in clinical (psychology and anatomy) and musical foundations may be required, depending on the student's previous educational background.

M.S. in Music Technology

On-Campus Program

The Master of Science in Music Technology provides graduate students an academic background in digital music production, instructional design, and multimedia development. Current graduates of this master's program have found employment in a wide range of business and educational settings. Participants develop skills in designing software, using authoring tools and languages, applying multimedia concepts, and managing technology facilities and projects. This degree is offered as an on-campus or online program.

Admission Requirements

1. Bachelor's degree (with demonstrated musicalskills)
2. Minimum grade point average of 3.0 (4.0 scale)
3. Submission of a university and a department application
4. Official transcripts of all undergraduate and graduate study
5. Evidence of musicianship through performance videotape, audio cassette, CD/DVD, or live audition
6. Three letters of recommendation required tosupport the admission application
7. In-person or telephone admission interview withthe Head of Graduate Studies
8. Non-native speakers must demonstrate English language proficiency with a minimum TOEFL score of 550/79 International students will also need to meet the application requirements of theIUPUI Office of International Affairs

Admission Categories

Upon receipt of the completed application, letters of recommendation, transcript, evidence of musicianship, and the interview, the Graduate Admissions Committee of the IU Department of Music and Arts Technology at IUPUI may grant regular admission, grant admission on probation, or reject the application.

Admission on Probation

Students who do not have an undergraduate and graduate grade point average of 3.0 or higher may be admitted on probation in exceptional cases. The probationary status continues until 9 credit hours of course work have been successfully completed. At this time student admission requests are re-evaluated. Students who are admitted on probation and incur academic probation during their first semester of study are subject to dismissal.

Degree Requirements

- 30 credit hours (18 credit hours at the 500 level or above)
- 6 credit hours in cognate courses (at the 400 level or above) to be selected from music, business, communications, computer science, education, fine arts, or law
- 6 credit hours of approved courses (at the 400 level or above) from the cognate field or other fields with the approval of the Head of Graduate Studies

Minimum Grade Point Average

- 3.0 average to continue
- No grades lower than B in core courses arecounted toward the degree
- No grades lower than C are counted toward thedegree

Residency Requirements (for on-campus students only)

- Three consecutive summers, two contiguous academic terms

Core Courses

The following courses, totaling 18 credit hours, are required of all students enrolled in the Master of Science in Music Technology program:

Class/Credit Hours

- N512 Foundations of Music Production - 3 cr.
- N513 Principles of Multimedia Technology - 3 cr.
- N514 Music Technology Methods - 3 cr.
- N515 Multimedia Design Applications in the Arts - 3 cr.
- N516 Advanced Interactive Design Applications in the Arts - 3 cr.
- N517 Internship in Arts Technology or N518 Arts Technology Major Project - 3 cr.

Total Credit Hours - 18

Cognate Field Courses
Six (6) credit hours are required in an approved cognate field within or outside the Department of Music and Arts Technology. Students may choose to complete the remaining 6 credit hours with emphasis in one of the following areas: music, business, communications, computer science, education, fine arts, law, or others with the approval of the department. The cognate field may become a minor if at least 12 credit hours are taken in one field.

Internship or Technology Project
Students may elect to enroll in an internship (N517) or develop a multimedia project (N518) as the summative experience in the program. Either option is supervised by the student's academic advisor and requires a full report. (These courses are part of the core courses listed previously.) Students participating in the internship are placed in an academic technology setting or an industry setting for one semester of experience working with technology and multimedia experts. No thesis is required for the degree.

Online Program: Master of Science in Music Technology
The IUPUI Department of Music and Arts Technology offers the entire M.S.M.T. Program "live," using streaming video, videoconferencing and audio through the Internet. All course and degree requirements are the same as the on-campus program.

Admission Requirements
- Bachelor's degree (with demonstrated musical skills)
- Minimum grade point average of 3.0 (4.0 scale)
- Submission of a university and a department application
- Official transcripts of all undergraduate and graduate study
- Evidence of musicianship through performance videotape, audio cassette, or CD/DVD
- Three letters of recommendation are required tosupport the admission application
- In-person or telephone admission interview withthe Head of Graduate Studies
- Non-native speakers must demonstrate English language proficiency with a minimum TOEFL score of 550/79 International students will also need to meet the application requirements of theIUPUI Office of International Affairs

Admission Categories
Upon receipt of the completed application, letters of recommendation, transcript, evidence of musicianship, and the interview, the Graduate Admissions Committee of the IU Department of Music and Arts Technology at IUPUI may grant regular admission, grant admission on probation, or reject the application.

Admission on Probation
Students who do not have an undergraduate and graduate grade point average of 3.0 or higher may be admitted on probation in exceptional cases. The probationary status continues until 9 credit hours of course work have been successfully completed. At this time student admission requests are re-evaluated. Students who are admitted on probation and incur academic problems during their semesters of study are subject to dismissal.

Degree Requirements
- 30 credit hours (18 hours at the 500 level orabove)
- 6 credit hours in cognate courses (at the 400 level or above) to be selected from music, business, communications, computer science, education, fine arts, or law
- 6 credit hours of approved courses (at the 400 level or above) from the cognate field or other fields with the approval of the Head of Graduate Studies

Minimum Grade Point Average
- 3.0 average to continue
- No grades lower than B in core courses arecounted toward the degree
- No grades lower than C are counted toward thedegree

Virtual Residency Requirement
Course enrollment during three consecutive summers, or one summer and a contiguous academic term.

Core Courses
The following courses, 18 credit hours, are required of all students enrolled in the M.S.M.T. program:

Class/Credit Hours

- N512 Foundations of Music Production - 3 cr.
- N513 Principles of Multimedia Technology - 3 cr.
- N514 Music Technology Methods - 3 cr.
- N515 Multimedia Design Applications in the Arts - 3 cr.
- N516 Advanced Interactive Design Applications in the Arts - 3 cr.
- N518 Arts Technology Major Project - 3 cr.

Total Credit Hours - 18

Cognate Field Courses
Six (6) credit hours are required in an approved cognate field within or outside the Department of Music and Arts Technology. Students may choose to complete the remaining 6 credit hours with emphasis in one of the following areas: music, business, communications, computer science, education, fine arts, law, or others with the approval of the department. The cognate field may become a minor if at least 12 credit hours are taken in one field.

Technology Project
Students develop a multimedia project (N518) as the summative experience in the program. This project is supervised by the student's academic advisor and requires a full report. (This course is part of the core courses listed previously.) No thesis is required for the degree.

M.S. in Music Therapy
The Master of Science in Music Therapy program is designed to provide professional music therapists with advanced research skills and clinical practice in music therapy, and to teach music therapists how to utilize the array of tools available in music technology for such purposes. This degree is offered on campus and online.

Admission Requirements
1. Bachelor's degree in music therapy or its equivalent
2. Board certified by the Certification Board for Music Therapists

3. Minimum grade point average of 3.0 (4.0 scale)
4. Submission of a university and adepartment application
5. Official transcripts of all undergraduate and graduate study
6. Three letters of recommendation
7. In-person or telephone admission interview withmusic therapy faculty
8. Videotaped music therapy session (with accompanying documentation, the function oftherecording is equivalent to a music audition;it will not be an actual session)
9. Non-native speakers must demonstrate English language proficiency with a minimum TOEFL score of 600/97. International students will also need to meet the application requirements of theIUPUI Office of International Affairs.

Admission Categories

Upon receipt of the completed application, letters of recommendation, transcript, evidence of musicianship, and the interview, the Graduate Admissions Committee of the IU Department of Music and Arts Technology at IUPUI may grant regular admission, grant admission on probation, or reject the application.

Admission on Probation

Students who do not have an undergraduate and graduate grade point average of 3.0 or higher may be admitted on probation in exceptional cases. The probationary status continues until 9 credit hours of course work have been successfully completed. At this time student admission requests are re-evaluated. Students who are admitted on probation and incur academic probation during their first semester of study are subject to dismissal.

Degree Requirements

- A total of thirty (30) credit hours are required for completion of the degree, including:
- 12 credit hours in music therapy (at the 500 level or above);
- 9 credit hours in core music technology courses (at the 500 level or above);
- 6 credit hours of cognates (at the 500 level or above);
- 3 credit hours of thesis

Minimum Grade Point Average

- Minimum 3.0 average to continue
- No grades lower than B in core courses arecounted toward the degree
- No grades lower than C are counted toward thedegree

Core Courses

The following courses are required of all students enrolled in the Master of Science in Music Therapy program:

Class/Credit Hours

- N512 Foundations of Music Production - 3 cr.
- N513 Principles of Multimedia Technology - 3 cr.
- N514 Music Technology Methods - 3 cr.
- N521 Research Methods in Arts and Music Technology - 3 cr.
- N530 Philosophy and Theory in Music Therapy - 3 cr.
- N531 Music Therapy Quantitative and Qualitative Research - 3 cr.
- N532 Music in Medicine - 3 cr.
- N533 Advanced Clinical Techniques in Music Therapy - 3 cr.
- N600 Music Therapy Thesis
-

Music Therapy Thesis

The thesis is the final academic requirement for the degree. The thesis proposal must be approved by a faculty committee before enrollment in the thesis will be permitted.

Other Information

IUPUI Music Academy

The IUPUI Music Academy is a non-profit community music school committed to providing high quality, professional music instruction to area residents of all ages and levels of ability. The academy serves over 500 people each year, ages 18 months through adulthood, by offering music classes for children and adults, ensembles, and private lessons. The academy is a member of the National Guild of Community Schools of the Arts.

Music at the Center for Young Children

Children attending the IUPUI Center for Young Children (CYC) can participate in preschool music classes during the weekday. Classes are held at the CYC after lunch, so students do not miss any instruction time from the CYC program.

For more information, contact:

E.J. Choe, Director
IUPUI Music Academy
535 W. Michigan Street, Room 378
Indianapolis, IN 46202

musacad@iupui.edu
Phone: (317) 278-4139
Fax: (317) 278-2590
Web: www.musicacademy.iupui.edu

International Music Technology Conference and Workshop

The Annual International Music Technology Conference and Workshop is hosted in Indianapolis during the latter part of June. Participants may register for graduate credit. During the International Computer Music Technology Conference, they will be able to see and experiment with the latest technology. There is a technology facility and three labs to which they may have access.

The IUPUI Computer Music Technology Facility includes two fully-networked computer music technology laboratories with video-streaming equipment for Internet-based participants. Eachworkstation is equipped with a multimedia computer and an Axiom 61keyboard. The Digital Keyboard Lab is equipped with 16Roland keyboards, a Roland controller audio system, Dell XPS-one computers, and a Teacher Station.

The Graduate Multimedia Lab has full production capabilities, including a digital flatbedscanner, video and photographic digital cameras, sound- and video-editing software, multimedia authoring tools and CD/DVD-ROM burner hardware and software. Both PC and Macintosh computers are available.

The Digital Sound Design Lab provides capabilities for all aspects of digital audio and MIDI-based production for sound tracks, multimedia design, sound sampling, sound design, and collaborative composition over the Internet.

Participants have the opportunity to work with both Macintosh and Windows applications. Topics include the following:

- Multimedia applications
- CD/DVD technology
- Music notation, sequencing and sampling
- Internet resources and Web design
- Computer-based music instruction
- Music workstation design and construction
- Grant writing and fundraising for technology support
- Computer-based music curriculum design
- Special topics (e.g., podcasting, wikis, distance learning, new music software products)

Technology, Leadership & Communication (TLC)

Chair: M. Bannatyne
Associate Chair: W. Worley, Associate Professor of Technical Communication

It would be an understatement to say that the world about us is changing at a pace unprecedented in any other era of history. If I were to try and identify the most significant influence that has pushed these changes along, I would have to name the computer.

The amazing changes in our world have not resulted simply due to the invention of the computer itself, but rather from the multitude of applications that computer has opened up to us for our own use and pleasure. Once only viewed as a means to calculate answers to complex equations, we now look in awe at the way visual information on a computer screen is hurdled across the arch of heaven from one nation to another in an endless stream of digital bits and bytes. Indeed, the computer and its associated networks have made information available to us in such quantities that a hundred lifetimes would never be long enough to capture even the smallest fraction of it all. At times, I am sure that many of us may feel this flood of information may seem more of "a solution in search of a problem" rather than the means of bringing any inquiry to a successful conclusion.

"What are we to do with this plethora of data and images?" The answer is simple, "Use what we need, and pass the rest along to other areas of discovery and learning!" With the vast wealth of visual information available to us via the computer, we can now reach out to colleagues and students in ways that were only a mere generation ago still a dream of things yet in the distant future. While an argument might certainly be made that the computer's greatest value is shown through the visual graphics it can provide to support education, we must be careful that we do not attribute to the computer any prowess that does not exist.

Perhaps the most significant change the computer has made in our lives is the way we think about it. Where once we were told, "The computer cannot make a mistake", we now view the computer as a valuable resource that assists us to get a job done in a manner that suits our needs. We now accept the technological change that the computer caused, not so much as a miracle that is only understood by a few, but as a tool that has become a part of our natural domain...a tool that is expected to solve many of our problems. In the final analysis, perhaps ultimately this change in our perception will be seen as the greatest change of all in our world.

We live in a remarkable technological age, but stay tuned for the best is yet to come. Join us in DCT where we will help prepare you to meet the design and communication challenges of living in the future with confidence.

Architechtural Technology

Associate Professor and Director: J. Cowan
Assistant Professor: B. Kelceoglu
Assistant Clinical Professor: D. Nickolson

The Architectural Technology (ART) curriculum offers a two-year associate degree program designed to provide students with the skills to work in the areas of architectural visualization, detailing, building information modeling (BIM), fundamental structural design, space planning, materials testing, inspection, and sales. The curriculum is not intended to prepare students for registration as professional architects.

Emphasis is on building science and technical design, residential and commercial construction drawings, mechanical and electrical systems in buildings, and the graphic depiction of these systems using building information modeling software. Also included are courses in mathematics, physical sciences, social sciences, communications, interior design, and the humanities.

Graduates typically find employment with architectural firms, design agencies, construction firms, building material suppliers, and various governmental agencies. Graduates are also eligible to pursue a Bachelor's degree in Computer Graphics Technology with an emphasis on Architectural Visualization. This combination of courses and skills also prepares students to apply for graduate programs in the design field (e.g., architecture, computer graphics).

The career educational objectives for Architectural Technology are:

- Demonstrate excellent technical capabilities in architectural technology and related fields.
- Be responsible citizens.
- Continue professional advancement through life-long learning
- Apply sound design methodology in multidisciplinary fields of architectural technology that is sensitive to the health, safety and welfare of the public.
- Competently use mathematical, measurement, instrumentation, and testing techniques.
- Practice effective oral, written and visual communication skills.
- Understand the environmental, ethical, diversity, cultural and contemporary aspects of their work.
- Work effectively and collaboratively in architectural, engineering and construction industries.

Associate of Science in Architecture Technology

Freshman Year

First Semester (17 credit hours)

- ART 16500 Building Systems and Materials, 3 credits
- ART 10500 Intro to Design Technology, 3 credits*
- MATH 15900 Pre-Calculus, 5 credits**
- ENG-W131 Elementary Composition I, 3 credits
- COMM-R 110 Fundamentals of Speech Communication, 3 credits

Second Semester (18 credit hours)

- ART 11700 Intro to Construction Graphics with CAD, 3 credits
- ART 12000 Architectural Presentation, 3 credits
- INTR 20200 INTR Materials & Applications, 3 credits
- INTR 12500 Color and Lighting of Interiors, 3 credits
- CEMT 10400 Fundamentals of Surveying, 3 credits
- Humanities/Social Science Elective, 3 credits

Sophomore Year

Third Semester (17 credit hours)

- ART 15500 Residential Construction, 3 credits
- CEMT 16000 Statics, 3 credits
- CEMT 21500 Mechanical & Electrical Systems, 4 credits
- Lab Science Selective, 4 credits
- INTR 12400 Space Plan for Interiors, 3 credits

Fourth Semester (17 Credits)

- ART 21000 History of Architecture, 3 credits
- ART 22000 Commercial Construction, 3 credits
- CGT 21100 Raster Imaging for Computer Graphics, 3 credits
- TCM 22000 Technical Report Writing, 3 credits
- CEMT 26000 Strength of Materials, 3 credits
- CEMT 26700 Materials Testing, 2 credits

**Co-Listed with INTR 10300*

***MATH 15300 and 15400 are can be substituted for MATH 15900*

Computer Graphics Technology

Associate Professor: M. Bannatyne
Clinical Assistant Professor: D. Baldwin
Lecturer: C. Koch
Visiting Lecturer: B. Hansen

Computer Graphics Technology (CGT) prepares visually oriented students to succeed in a wide range of industries, spanning careers in animation and film to multimedia and design. CGT students are visual problem solvers who develop the technological and aesthetic skills a booming industry demands in this exciting and rewarding field of study. Students can choose to study animation or multimedia from outstanding teaching faculty, rich with industry experience.

Consistent with the criteria set by the Accreditation Board for Engineering and Technology (ABET), the Program Educational Objectives of the CGT program within the Department of Design and Communication Technology (DCT) are "*To produce graduates who, during the first few years of professional practice, will...*":

- Show their ability to solve problems related to the workplace through their application of excellent technical capabilities in visual communication, computer systems, and related supporting field
- Be responsible citizens in the workplace through their demonstrated ethical and professional conduct and appreciation for diversity in its various forms
- Continue their professional advancement through life-long learning opportunities, in-service training, and engagement with professional organizations
- Practice effective oral and written communication skills
- Show their ability to address diverse environmental, ethical, legal, cultural diversity, and contemporary social aspects of their work
- Work collaboratively and effectively in diverse enterprises where they may be asked to act as a liaison between their company and the client
- Have the ability to function both as an individual, and within the dynamics of a group environment, in the workplace

Bachelor of Science in Computer Graphics Technology

Interactive Multimedia Developer Track

Freshman Year

1st Semester (16 hours required)

Course	*Hrs*
*CGT 10100 - Introduction to CGT	3
*CGT 11100 - Design for Visualization & Comm.	3
*CGT 11200 - Sketching for Visualization & Comm.	3
ENG-W 131 - Elementary Composition I	3
TECH 10200 - Discovering Technology	1
MATH-M 11800 - Finite Mathematics	3

2nd Semester (15 hours required)

Course	*Hrs*
*CGT 11600 - Geometric Mod. for Visual. & Comm.	3
*CGT 11700 - Illustrating for Visual. & Comm.	3
COMM-R 110 - Fund. of Speech Communication	3

Human./Social Science Elective	3
**MATH-M 11900 - A Brief Survey of Calculus I	3

1st Semester (15 hours required)

Course	*Hrs*
*CIT 21200*** - Website Design	3
*CGT 21100 - Raster imaging for Computer Graphics	3
*CGT 21600 - Vector Imaging for Computer Graphics	3
Science Elective	3
TCM 34000 - Correspondence in Business & Industry	3

2nd Semester (15 hours required)

Course	*Hr*
*CGT 24100 - Introduction to Animation	3
*CGT 25100 - Principles of Creative Design	3
*CGT 29900 - Seminar: Portfolio Review	2
TCM 25000 - Career Planning	1
Free Elective	3
PSY-B 104 - Psychology as a Social Science	3

Junior Year

1st Semester (15 hours required)

Course	*Hr*
*CGT 35100 - Multimedia Authoring I (or CGT 353)	3
*CGT 35600 - Dynamic Content Development I	3
CIT 21400 - Using a Database Management System	3
Human./Social Science or Liberal Arts Elective	3
TCM 37000 - Oral Practicum for Technical Managers	3

2nd Semester (15 hours required)

Course	*Hr*
*CGT 34600 - Digital Video & Audio	3
*TECH 20010 - Career Enrichment Internship I	3
* CGT 45100 - Multimedia Application Development	3
* CGT 45600 - Dynamic Content Development II	3
CIT 21500 - WEB Programming	3

Senior Year

1st Semester (16 hours required)

Course	*Hr*
Business/Economics/Marketing Selective	3
*CGT 41100 - Contemporary Problems in A.C.G.	3
*TECH 30010 - Career Enrichment Internship III	3
*CGT 49900 - Senior Seminar	1
Technical Elective	3
Technical Elective	3

2nd Semester (16 hours required)

Course	*Hr*
*CGT 41500 - Seminar for Senior Design Project	1
*CGT 41600 - Senior Design Project	3
Free Elective	3
Human./Social Science or Liberal Arts Elective	3

OLS 27400 - Applied Leadership	3
Technical Elective	3
Total Hours for Baccalaureate Degree	123

Technical Animation and Spatial Graphics Track

Freshman Year

1st Semester (16 hours required)

Course	*Hrs*
*CGT 10100 - Introduction to CGT	3
*CGT 11100 - Design for Visualization & Comm.	3
*CGT 11200 - Sketching for Visualization & Comm.	3
ENG-W 131 - Elementary Composition I	3
TECH 10200 - Discovering Technology	1
MATH-M 11800 - Finite Mathematics	3

2nd Semester (15 hours required)

Course	*Hrs*
*CGT 11600 - Geometric Mod. for Visual. & Comm.	3
*CGT 11700 - Illustrating for Visual. & Comm.	3
COMM-R 110 - Fund. of Speech Communication	3
Human./Social Science Elective	3
**MATH-M 11900 - Brief Survey of Calculus I	3

Sophomore Year

1st Semester (15 hours required)

Course	*Hrs*
*CIT 21200*** - Website Design	3
*CGT 21100 - Raster imaging for Computer Graphics	3
*CGT 21600 - Vector Imaging for Computer Graphics	3
Science Elective	3
TCM 34000 - Correspondence in Business & Industry	3

2nd Semester (15 hours required)

Course	*Hrs*
*CGT 24100 - Introduction to Animation	3
*CGT 25100 - Principles of Creative Design	3
*CGT 29900 - Seminar: Portfolio Review	2
TCM 25000 - Career Planning	1
Free Elective	3
PSY-B 10400 - Psychology as a Social Science	3

Junior Year

1st Semester (15 hours required)

Course	*Hr*
*CGT 34100 - Motion for Computer Animation	3
*CGT 35100 (MM Auth. I) or CGT 356 (Hyper. Auth. I)	3
*CGT 39000 - Seminar: Storyboarding & Preproduction	3
Human./Social Science Elective	3
TCM 37000 - Oral Practicum for Technical Managers	3

2nd Semester (15 hours required)

Course	*Hr*
*CGT 34000 - Digital Light. & Render. For Com. Anim.	3

*CGT 44400 - Visual Effects in Film and Animation	3
*TECH 20010 - Career Enrichment Internship I	3
*CGT 44200 - Production for Computer Animation	3
Free Elective	3

1st Semester (16 hours required)

Course	*Hr*
Business/Economics/Marketing Selective	3
*CGT 41100 - Contemporary Problems in A.C.G.	3
*TECH 30010 - Career Enrichment Internship III	3
*CGT 49900 - Senior Seminar	1
Technical Elective	3
CGT 34600 - Digital Video & Audio (VideoI)	3

2nd Semester (16 hours required)

Course	*Hr*
*CGT 41500 - Seminar for Senior Design Project	1
*CGT 41600 - Senior Design Project	3
*CGT 44600 - Digital Postproduction (Video II)	3
Human./Social Science or Liberal Arts Elective	3
OLS 27400 - Applied Leadership	3
Technical Elective	3
Total Hours for Baccalaureate Degree	123

**CGT CORE courses require a grade of C- or higher to pass*

***Math 118 & 119 or Math 153 & 154 may be used in place of Math 159*

****CSCI-N 241 may be substituted for this course*

Interior Design Technology

Assistant Clinical Professor: E. McLaughlin (Program Director)
Assistant Clinical Professor: D. Nickolson
Assistant Professor: B. Kelceoglu
Lecturer: M.A. Frank

Associate of Science in Interior Design Technology

The Interior Design curriculum is a two year Associate of Science (A.S.) degree program that uses the latest technology while employing faculty from the areas of interior design, architecture, fine arts, and computer graphics to provide students with the skills necessary to work as interior design assistants and be able to sit for the National Council for Interior Design Qualification (NCIDQ) exam after approximately four years of work experience.

The emphasis is on technical knowledge, methodology, and aesthetic appreciation of interior design for the health, safety, and welfare of the public; equipping students with visual presentation and communication skills; imparting awareness for environmental, business, ethical, and other contemporary issues; and linking classroom knowledge to applications in the field. These graduates can address complex design problems and manage projects.The educational objective for the A.S. Interior Design are:

1. Demonstrate technical knowledge and application of the design process.
2. Solve problems that are quantitative in nature.
3. Analyze complex issues and apply sound design methodology in multidisciplinary fields of interior design technology.
4. Practice effective communication skills in, oral, written and visual presentations.
5. Increase knowledge and demonstrate solutions sensitive to health, safety and welfare of the public.
6. Work collaboratively and effectively in technology and design related industries.
7. Continue professional advancement through life-long learning.
8. Understand the environmental, ethical, diversity, cultural and contemporary aspects of their work.
9. Be responsible citizens.

Graduates typically find employment in residential design fields in retail settings as sales associates or as manufactur's reps for products, in the kitchen and bath industry, as CAD technicians for the interior design or architecture fileds, or as self-employed designers.

Freshman Year

First Semester (15 credits)

- **COMM-R 110:** Fundamentals of Speech Communication, 3 credits.
- **ENG-W 131**: Elementary Composition I, 3 credits.
- **MATH 15300:** Algebra & Trig I, 3 credits.
- **HER E109**: Color and Design, 3 credits.
- **INTR 10300:** Introduction to Interior Design, 3 credits.

Second Semester (15 credits)

- **ART 11700:** Introduction to Construction Drafting with CAD, 3 credits.

- **ART 12000**: Architectural Presentation, 3 credits.
- **INTR 15100**: Textiles for Interiors, 3 credits.
- **CGT 21100**: Raster Imaging for Computer Graphics, 3 credits.
- **HER-E 209**: Drawing for Interior Design, 3 credits.

Sophomore Year
Third Semester (15 credits)

- **ART 15500:** Residential Construction, 3 credits.
- **INTR 12400:** Space Planning for Interiors, 3 credits.
- **INTR 12500**: Color and Lighting, 3 credits.
- **INTR 20200**: Interior Materials and Applications, 3 credits.
- **INTR 20400**: History of Interiors and Furniture, 3 credits.

Fourth Semester (15 credits)

- **ART 21000:** History of Architecture, 3 credits.
- **ART 22200**: Commercial Construction, 3 credits.
- **INTR 22400:** Residential I, Kitchen and Bath, 3 credits.
- **INTR 22500**: 3D Interior Design Studio, 3 credits.
- **INTR 22600**: Commercial Systems I, 3 credits.

Bachelor of Science in Interior Design Technology

The Interior Design curriculum is a four-year Bachelor of Science (B.S.) degree program that employs faculty from the areas of interior design, architecture, fine arts, computer graphics, construction and organizational leadership to provide students with the skills necessary to work as professional interior designers and be able to sit for the National Council for Interior Design Qualification (NCIDQ) exam after approximately two years of work experience.

The emphasis is on technical knowledge, methodology, and aesthetic appreciation of interior design for the health, safety, and welfare of the public; equipping students with visual presentation and communication skills; imparting an awareness for environmental, business, ethical, and other contemporary issues; and linking classroom knowledge to application in the field. These graduates can address complex design problems and manage projects.

The educational objectives for the B.S. Interior Design are:

1. Demonstrate technical knowledge and application of the design process.
2. Solve problems that are quantitative in nature.
3. Analyze complex issues and apply sound design methodology in multidisciplinary fields of interior design technology.
4. Practice effective communication skills in, oral, written and visual presentations.
5. Increase knowledge and demonstrate solutions sensitive to health, safety and welfare of the public.
6. Work collaboratively and effectively in technology and design related industries.
7. Continue professional advancement through life-long learning.
8. Understand the environmental, ethical, diversity, cultural and contemporary aspects of their work.
9. Be responsible citizens.

Graduates typically find employment in residential or commercial design fields as designers, in retail or manufacturing settings as sales associates, in design and construction industries as manufacturer's reps for products, as CAD technicians for the interior design or architecture fields, or as self-employed designers.

Freshman Year
First Semester (15 credits)

- **COMM-R 110:** Fundamentals of Speech Communication, 3 credits.
- **ENG-W 131**: Elementary Composition I, 3 credits.
- **MATH 15300:** Algebra & Trig I, 3 credits.
- **HER E109**: Color and Design, 3 credits.
- **INTR 10300:** Introduction to Interior Design, 3 credits.

Second Semester (15 credits)

- **ART 11700**: Introduction to Construction Drafting with CAD, 3 credits.
- **ART 12000**: Architectural Presentation, 3 credits.
- **INTR 15100:** Textiles for Interiors, 3 credits.
- **CGT 21100**: Raster Imaging for Computer Graphics, 3 credits.
- **HER-E 209**: Drawing for Interior Design, 3 credits.

Sophomore Year
Third Semester (15 credits)

- **ART 15500**: Residential Construction, 3 credits.
- **INTR 12400**: Space Planning for Interiors, 3 credits.
- **INTR 12500**: Color and Lighting, 3 credits.
- **INTR 20200**: Interior Materials and Applications, 3 credits.
- **INTR 20400**: History of Interiors and Furniture, 3 credits.

Fourth Semester (15 credits)

- **ART 21000**: History of Architecture, 3 credits.
- **ART 22200**: Commercial Construction, 3 credits.
- **INTR 22400**: Residential I, Kitchen and Bath, 3 credits.
- **INTR 22500**: 3D Interior Design Studio, 3 credits.
- **INTR 22600:** Commercial Systems I, 3 credits.

Junior Year
Fifth Semester (15 credits)

- **INTR 30400:** History of American Interiors and Furn., 3 credits
- **INTR 32400**: Residential Interior Design Studio II, 3 credits.
- **INTR 32500:** Environmental Lighting Design, 3 credits.
- **CGT 22000**: Graphical Represent. in Arch. Docs, 3 credits.
- **OLS 25200**: Human Behavior in Organizations, 3 credits.

Sixth Semester (15 credits)

- **INTR 32600:** Commercial Interiors II, 3 credits.
- **CGT 32100**: Advanced Digital Pictorial Illustration, 3 credits.
- **ART History Selective:** See approved list, 3 credits.
- **TECH 30010**: Internship, 3 credits.
- **TECH Selective:**, Suggest TCM 220 or TCM 340, 3 credits.

Senior Year

Seventh Semester (15 credits)

- **CEMT 34700:** Construction Contract Admin. and Specifications, 3 credits.
- **Humanities or Social Science Elective:**, 3 credits.
- **INTR 42600**: Healthcare Design Studio, 3 credits.
- **INTR 45200**: Building Systems, 3 credits.
- **INTR 45300**: Business Practices, 3 credits.

Eighth Semester (15 credits)

- **INTR 42800**: Capstone, 3 credits.
- **INTR 48000**: Senior Thesis, 3 credits.
- **INTR 49500:** Sustainable Design, 3 credits.
- **OLS 37100:** Project Management, 3 credits.
- **Humanities/Soc. Science Elective**: See Approved List, 3 credits.

NOTE: A grade of a C or higher must be obtained in all INTR courses in order to progress in the program.

Plan of Study effective fall 2013.

Technical Communication

Associate Professor: W. Worley (Director)
Associate Professor: M. Hovde
Visiting Assistant Professor: C. Renguette

The Technical Communication Program offers specialized courses for students in engineering and technology programs that help them prepare for the writing and speaking tasks they will perform as part of their professional work. These courses build on students' previous experiences in written and oral communication and help them learn to present technical information effectively to audiences in organizational settings. In addition, the program works with other schools and local industry to prepare students for careers as technical communicators.

Certificate in Technical Communication

The undergraduate Technical Communication Certificate is offered by the Purdue School of Engineering and Technology. Any student formally admitted to the university may be a candidate for the certificate.

Students who earn the certificate will have demonstrated they have the core competencies necessary for entry-level positions as technical communicators: the ability to gather and transform technical information for a variety of audiences and the ability to design, develop, and edit effective products using rhetorical principles and current technology.

Technical or Scientific Specialty

A technical or scientific major or minor or technical interest demonstrated by 6 credit hours of courses, including CIT 10600 or CIT 11200 or an equivalent introductory computer course.

Required Courses: 13 credits

One course selected from each of these five areas:

1. Introduction to Technical Communication (choose one) - 3 credits
- TCM 22000 Technical Report Writing (online sections available)
- TCM 23000 Principles and Practices of Technical Communication (under development)
- TCM 32000 Written Communication in Science and Industry (online sections available)
- TCM 38000 Technical Communication in the Healthcare Professions (online only)

2. Visual Technical Communication - 3 credits
- TCM 35000 Visual Elements of Technical Documents

3. Editing - 3 credits
- ENG-W 365 Theories and Practices of Editing

4. Advanced Applications of Technical Communication (choose one) - 3 credits
- TCM 39500 Independent Study
- TCM 42000 Field Experience
- TCM 42500 Managing Document Quality (offered fall semester)
- TCM 45000 Research Approaches for Technical & Professional Communication (offered spring semester)
- ENG-W 315 Writing for the Web (online only)

5. Career Development (choose one) - 1 credit
- TCM 25000 Internship and Career Planning
- TCM 43500 Portfolio Preparation

Professional Preparation

Near the end of their coursework, students may complete a professional portfolio, suitable for job hunting, which includes three to five deliverables that demonstrate a range of skills and competencies. Practicing technical communicators will review the portfolio and provide responses. As an alternative, students may take TCM 25000 Career Planning in Engineering and Technology, a course that prepares them for professional employment.

Supplemental Course

- ENG-W 412 Technology and Literacy
- IET 36400 Total Quality Control
- INFO-I 270 Introduction to Human-Computer Interaction Principles and Practices
- INFO-I 275 Introduction to Human-Computer Interaction Theory
- INFO-I 300 Human-Computer Interaction
- JOUR-J 390 Corporate Publications
- JOUR-J 463/563 Desktop Publishing
- OLS 27400 Supervisory Management
- OLS 37500 Training Methods
- OLS 38500 Leadership for Quality & Productivity
- TCM 37000 Oral Practicum for Technical Managers
- TCM 49900 Selected Topics in TCM

Policies & Procedures

Undergraduate Policies

Academic Warning

A student whose semester grade point average (GPA) falls below a 2.0, but whose cumulative GPA is a 2.0 or higher, will be placed on academic warning. Students on academic warning will be required to meet with their academic advisor before being able to register for classes. A student will be advised of academic warning status by the Office of the

Associate Dean for Academic Affairs and Undergraduate Programs.

Academic Probation

A student whose cumulative grade point average (GPA) falls below a 2.0 will be placed on probation. Students on academic probation will be required to meet with their academic advisor before being able to register for classes. The student may continue studies provided the student achieves a semester GPA of at least 2.0 for each semester while on probation. Once the cumulative GPA is at least 2.0, the student will be removed from probationary status. A student will be advised of probationary status and the possibility of dismissal by the Office of the Associate Dean for Academic Affairs and Undergraduate Programs.

Dismissal

A student on probation who has completed a minimum of 12 IUPUI grade point average (GPA) hours is subject to dismissal from the School if the student fails to attain a GPA of at least 2.0 in any two consecutive IUPUI semester (fall and spring), including the semester that the student was first placed on probation.

A student can also be dismissed from the School when, in the opinion of the Associate Dean for Academic Affairs and Undergraduate Programs in consultation with the student's major department, the student has ceased making progress in the degree program. Examples of lack of progress may include, but are not limited to, average GPA in courses in the major below 2.0, multiple semesters with semester GPA below 2.0, and repeated failures in core courses in the curriculum. Students in danger of dismissal due to failure to make academic progress will be required to meet with their academic advisor.

A student will be notified of dismissal by the Office of the Associate Dean for Academic Affairs and Undergraduate Programs.

Readmission

A student dismissed for the first time from the Purdue School of Engineering and Technology or another Purdue School must remain out of school at least one regular (fall or spring) semester. During the semester out of school, the student may petition the School of Engineering and Technology for readmission. A student dismissed for the second time must remain out of school at least two regular semesters (fall and spring), but may petition for readmission during the second semester out of school. Readmission after a second dismissal is extremely rare.

A student readmitted will be informed by the Office of the Associate Dean for Academic Affairs and Undergraduate Programs. The notification will specify any conditions and restrictions affecting readmission and continuance in the degree program. Readmitted students will be placed on probation. Readmitted students must earn a GPA of at least 2.0 each semester whil on probation or they will be dismissed again. Readmitted student will be removed from probation when their cumulative GPA is raised to 2.0. Students may contact Kelly Keelen at (317) 274-2761 or keelen@iupui.edu for a Petition for Readmission. Deadlines for submitting the petition is June 1 for fall and October 1 for spring.

Acceptance of Grade Replacement & Repeating Courses

Repeated Courses (Grade Replacement Policy)

Students enrolled in the School of Engineering and Technology are permitted to apply only the provisions of the IUPUI Grade Replacement Policy that pertain to repeating a course in order to achieve a higher grade. This replacement will affect a student's academic record only at the Purdue School of Engineering and Technology at IUPUI. If the student subsequently transfers to another academic unit at IUPUI or another campus, different interpretations of the grade replacement policy may be in place.

An undergraduate student who retakes any course may elect to have only the final grade counted in computation of the cumulative semester index, in accordance with the limitations listed below. After retaking the course, the enrollment and original grade will be removed from calculations used to determine the student's cumulative GPA. The student's transcript, however, will continue to show the original enrollment in the course and all grades earned for each subsequent enrollment.

This policy is subject to the following limitations:

- Students may exercise the grade replacement option for no more than 15 credit hours, including any courses in which the former FX option was used for their 1st undergraduate degree.
- A grade may be replaced only by another grade for the same class.
- A student may exercise the Grade Replacement Policy a maximum of two times for a single course.
- The request to remove a grade from the cumulative GPA calculation by this method is irreversible.
- The second enrollment for any course covered by this policy must have occurred during fall semester 1996 or later.

Students who plan to use the grade replacement option must complete and submit the grade replacement form to the Recorder in the Office of Academic Programs for processing after retaking the course.

Academic Regulations

E&T Course Drop Policy (Effective 3/27/2012)

Undergraduate students admitted to the School of Engineering and Technology in fall 2012 and beyond may not drop more than one course per semester. Furthermore, these students are limited to a total of eight withdrawals over the course of their academic career after admission to the School of Engineering and Technology. If extenuating circumstances warrant an exception to this policy, the exception must be approved both by the student's academic advisor and by the Associate Dean for Academic Affairs and Undergraduate Programs.

If due to extenuating circumstances a student must withdraw from school (drop every class) during an in-progress semester, the withdrawals in that semester will count as only a single withdrawal toward the career maximum of eight.

This policy does not apply to course adjustments made during the Add/Drop (100% refund) period. For first-year students (those with less than 26 total credit hours, both beginners and transfers) served by the New Student

Academic Advising Center, courses from which a student has been administratively withdrawn will not be counted toward the one-drop-per-semester limit.

For the purposes of this policy, linked lecture-lab courses taught under two different numbers are considered a single course. Likewise, the dropping all courses that make up a themed learning community will count as a single drop.

Grades and Grade Reports

Students are responsible for completing all required work in each of their courses by the last scheduled class meeting, unless course assignments have been properly cancelled. Students receive a grade in each course in which they are enrolled at the close of the session. Grades indicate what a student has achieved with respect to the objectives of the course, and instructors are required, by action of the Faculty Senate, to record the grade a student has earned in a course. Grades that have been officially recorded will be changed only in cases of instructor error or subsequent finding of student academic dishonesty.

Basis of Grades

The School of Engineering and Technology uses a grading system that may include plus and minus grades as well as straight letter grades for all undergraduate and graduate courses. These grades and their grade point values are indicated below.

For credit courses:

A or A+	4.0
A–	3.7
B+	3.3
B	3.0
B–	2.7
C+	2.3
C	2.0
C–	1.7
D+	1.3
D	1.0
D–	0.7
F	0.0 (no credit)

For credit courses taken under the Pass/Fail option:

P: Pass; equivalent to grade A through D– (no grade point value assigned).
F: Failure; failure to achieve minimal objectives of the course. The student must repeat the course satisfactorily in order to obtain credit for it. The F is factored into the student's grade point average.

For noncredit courses, including thesis research:

S: Satisfactory; meets course objectives (no grade point value assigned).
F: Unsatisfactory; does not meet course objectives (is factored into grade point average).
Note that no separate grades are given for course laboratory sections that have been given separate course designations for scheduling purposes.

Incomplete, Deferred, or Withdrawal grades for credit or noncredit courses (no grade point value assigned):

I: Incomplete, no grade; a temporary record indicating that the work is satisfactory as of the end of the semester but has not been completed. The grade of Incomplete may be assigned only when a student has successfully completed at least three-fourths of the work in a course and unusual circumstances prevent the student from completing the work within the time limits previously set. An instructor may require the student to secure the recommendation of the dean that the circumstances warrant a grade of Incomplete. When an Incomplete is given, the instructor will specify the academic work to be completed and may establish a deadline of up to one year. If the student has not completed the required work by the end of the following year, the registrar will automatically change the I to an F.
R: Deferred; a grade given for those courses that normally require more than one academic session to complete, such as project, thesis, and research courses. The grade indicates that work is in progress and that the final report has not been submitted for evaluation.
W: Withdrawal; a grade of W is recorded on the final grade report.

Withdrawing from Classes

During the first half of a semester or session, students may officially withdraw from classes without penalty if they obtain the approval of their advisor. During the third quarter of a semester or session, students may withdraw from classes if they obtain the approval of their advisor and the appropriate instructors; during the last quarter of the semester, students will be allowed to withdraw from classes only under extenuating circumstances. At that time they must obtain the approval of the appropriate instructors, their advisor, and the dean, and must also present a written justification from a doctor, member of the clergy, advisor, or similar person of authority. The fact that a student merely stops attending a class will not entitle the student to a grade of W.

Uses of the Pass/Fail Option

To provide students with the opportunity to broaden their education with less worry about the grades they may earn, an alternate grading system, the Pass/Fail option, is permitted for a limited portion of the required credit hours. The following general rules are currently applicable; individual departments may impose further restrictions.

- Subject to the regulations of divisions or departments, students may choose this option in any course that does not already appear on their academic record and that they are otherwise eligible to take for credit with a letter grade. Students may use this option for not more than 20 percent of the total credit hours required for graduation.
- Students taking a course under this option have the same obligations as those taking the course for credit with a letter grade. When instructors report final grades in the course, any student who would have earned a grade of A through D– will receive a P, and any student who has not passed will receive an F. The registrar will note either result on the student's academic records, but will not use the course in computing the grade point average unless the student receives an F.
- This option is not available to students on probation.
- This option is available for a maximum of two courses in any one semester and one course during a summer session.

- Students receiving the grade of Pass in a course taken under the Pass/Fail option may not retake the same course for a letter grade.
- Courses taken under Pass/Fail option and courses taken by correspondence may not be used to fulfill graduation requirements for engineering students. Whether the courses are accepted for technology students is up to each major department.

These rules are general or minimum guidelines for those electing this option. There are certain specific limitations on registration for the Pass/Fail option. This option may be elected only during continuing student registration, late registration, and the drop/ add period at the beginning of a semester or session. Changes from letter grade to Pass/Fail and vice versa may not be made after the second week of classes during the regular semester or after the first week of classes during the summer sessions.

Absence from Campus

Students who interrupt their course of study for more than one calendar year may be required to meet all departmental curriculum requirements for the program offered at the time of their return.

Scholastic Indexes

The scholarship standing of all undergraduate degree regular students is determined by two scholastic indexes: the semester index and the graduation index.

Semester Index

The semester index (semester grade point average) is an average determined by weighting each grade received (4.0 for an A, 3.7 for an A–, etc.) during a given semester and multiplying it by the number of credit hours in the course, adding up all the figures, and then dividing the sum by the total number of course credit hours obtained during that semester. Grades of P and S are not included in the computation; grades of F are included. The cumulative semester index is the weighted average of all courses taken by a student, except those to which the FX policy is applied. See “Repeated Courses (FX Policy)” above in this section of the bulletin.

Graduation Index

The graduation index (degree grade point average) is the weighted average of grades in only those courses that are used to meet the graduation requirements for the program in which the student is enrolled. When a student retakes a course with the advisor’s approval or later substitutes an equivalent course for one previously taken, only the most recent course grade is used by the school in calculating the graduation index. Since certain courses previously completed by the student may on occasion be omitted from a program of study, the graduation index and the cumulative semester index may differ.

Graduation Index Requirements

For all bachelor’s degrees in the School of Engineering and Technology, a minimum graduation index of 2.0 is required for graduation. Candidates for graduation from engineering programs must also have an index of 2.0 for all required engineering courses.
For the Associate of Science degree, a minimum graduation index of 2.0 is required for graduation.

Good Standing

For purposes of reports and communications to other institutions and agencies and in the absence of any further qualification of the term, students are considered in good standing unless they have been dismissed, suspended, or dropped from the university and have not been readmitted.

Graduate and Professional Policies

Academic Probation and Academic Dismissal

Academic standards for probation (warning status) and dismissal are established by the faculty for each specific academic program. Therefore, a student is subject to the regulations applicable to all students enrolled in a particular program at the time of registration. If students are experiencing academic difficulty, they are urged to consult their academic advisor as soon as possible.

Students will be notified by IUPUI e-mail from the Office of the Associate Dean for Academic Programs, School of Engineering and Technology, when they are placed on academic probation. The e-mail will also inform the student of the conditions that must be met for removal from academic probation. Students who are dismissed for academic reasons will also be notified by letter from the Office of the Associate Dean for Academic Programs.

The following standards are currently applicable for students enrolled in the School of Engineering and Technology.

Academic Probation

Graduate degree-seeking students are placed on academic warning and probation when either the cumulative index or the semester index is below 3.00 (B). Graduate students must maintain a semester and cumulative grade point average of at least 3.00 each semester to be in good standing. Academic probation will be removed when students achieve a semester and cumulative grade point average of 3.00. The minimum grade acceptable for a graduate-level course is C (2.00).

Full-time undergraduate students are automatically on academic probation when either the cumulative semester index or the semester index is below 2.0 (C). Part-time students are automatically on academic probation when either the cumulative semester index or the grade point average for the last 12 credit hours of consecutive enrollment is below 2.0 (C). All students on probation are automatically placed on academic checklist. Students on checklist must obtain the signature of a departmental advisor in order to register.
Students who, in subsequent enrollments, do not improve significantly may receive a letter stating that they will be subject to dismissal if an index of 2.0 (C) or higher is not earned in the current enrollment period. Such students may register only after their grades have been posted and their departmental checklist clearance form has been approved by the dean.

Removal from Probation

Students are removed from academic probation when they complete 12 credit hours of consecutive enrollment with a minimum grade point average of 2.0, provided their overall grade point average is also at or above 2.0.

Academic Dismissal

Full-time students may be dismissed when they fail to attain a 2.0 semester grade point average in any two consecutive semesters or when their cumulative semester index has remained below 2.0 (C) for any two consecutive semesters. Part-time students may be dismissed when their cumulative semester index or grade point average for the last 18 credit hours of consecutive enrollment is below 2.0 (C).

Readmission

A student who has been dropped due to scholastic deficiency may petition the Faculty Committee on Readmission for readmission. If readmitted, the student will be placed on probation. Students may contact the particular department for specific rules and regulations.

Acceptance of Grade Replacement & Repeating Courses

Students enrolled in the School of Engineering and Technology are permitted to apply only the provisions of the IUPUI Grade Replacement Policy that pertain to repeating a course in order to achieve a higher grade. This replacement will affect a student's academic record only at the Purdue School of Engineering and Technology at IUPUI. If the student subsequently transfers to another academic unit at IUPUI or another campus, different interpretations of the grade replacement policy may be in place.

An undergraduate student who retakes any course may elect to have only the final grade counted in computation of the cumulative semester index, in accordance with the limitations listed below. After retaking the course, the enrollment and original grade will be removed from calculations used to determine the student's cumulative GPA. The student's transcript, however, will continue to show the original enrollment in the course and all grades earned for each subsequent enrollment.

This policy is subject to the following limitations:

- Students may exercise the grade replacement option for no more than 15 credit hours, including any courses in which the former FX option was used.
- A grade may be replaced only by another grade for the same class.
- A student may exercise the Grade Replacement Policy a maximum of two times for a single course.
- The request to remove a grade from the cumulative GPA calculation by this method is irreversible.
- The second enrollment for any course covered by this policy must have occurred during fall semester 1996 or later.

Students who plan to use the grade replacement option must inform the engineering and technology recorder after they have retaken a course and wish to apply the policy.

Academic Regulations

Grades and Grade Reports

Students are responsible for completing all required work in each of their courses by the last scheduled class meeting, unless course assignments have been properly cancelled. Students receive a grade in each course in which they are enrolled at the close of the session. Grades indicate what a student has achieved with respect to the objectives of the course, and instructors are required, by action of the Faculty Senate, to record the grade a student has earned in a course. Grades that have been officially recorded will be changed only in cases of instructor error or subsequent finding of student academic dishonesty.

Basis of Grades

The School of Engineering and Technology uses a grading system that may include plus and minus grades as well as straight letter grades for all undergraduate and graduate courses. These grades and their grade point values are indicated below.

For credit courses:

A or A+	4.0
A–	3.7
B+	3.3
B	3.0
B–	2.7
C+	2.3
C	2.0
C–	1.7
D+	1.3
D	1.0
D–	0.7
F	0.0 (no credit)

For credit courses taken under the Pass/Fail option:

P: Pass; equivalent to grade A through D– (no grade point value assigned).F: Failure; failure to achieve minimal objectives of the course. The student must repeat the course satisfactorily in order to obtain credit for it. The F is factored into the student's grade point average.

For noncredit courses, including thesis research:

S: Satisfactory; meets course objectives (no grade point value assigned).
F: Unsatisfactory; does not meet course objectives (is factored into grade point average).
Note that no separate grades are given for course laboratory sections that have been given separate course designations for scheduling purposes.

Incomplete, Deferred, or Withdrawal grades for credit or noncredit courses (no grade point value assigned):

I: Incomplete, no grade; a temporary record indicating that the work is satisfactory as of the end of the semester but has not been completed. The grade of Incomplete may be assigned only when a student has successfully completed at least three-fourths of the work in a course and unusual circumstances prevent the student from completing the work within the time limits previously set. An instructor may require the student to secure the recommendation of the dean that the circumstances warrant a grade of Incomplete. When an Incomplete is given, the instructor will specify the academic work to be completed and may establish a deadline of up to one year. If the student has not completed the required work by the end of the following year, the registrar will automatically change the I to an F.
R: Deferred; a grade given for those courses that normally require more than one academic session to complete, such

as project, thesis, and research courses. The grade indicates that work is in progress and that the final report has not been submitted for evaluation.
W: Withdrawal; a grade of W is recorded on the final grade report.

Withdrawing from Classes

During the first half of a semester or session, students may officially withdraw from classes without penalty if they obtain the approval of their advisor. During the third quarter of a semester or session, students may withdraw from classes if they obtain the approval of their advisor and the appropriate instructors; during the last quarter of the semester, students will be allowed to withdraw from classes only under extenuating circumstances. At that time they must obtain the approval of the appropriate instructors, their advisor, and the dean, and must also present a written justification from a doctor, member of the clergy, advisor, or similar person of authority. The fact that a student merely stops attending a class will not entitle the student to a grade of W.

Uses of the Pass/Fail Option

To provide students with the opportunity to broaden their education with less worry about the grades they may earn, an alternate grading system, the Pass/Fail option, is permitted for a limited portion of the required credit hours. The following general rules are currently applicable; individual departments may impose further restrictions.

- Subject to the regulations of divisions or departments, students may choose this option in any course that does not already appear on their academic record and that they are otherwise eligible to take for credit with a letter grade. Students may use this option for not more than 20 percent of the total credit hours required for graduation.
- Students taking a course under this option have the same obligations as those taking the course for credit with a letter grade. When instructors report final grades in the course, any student who would have earned a grade of A through D– will receive a P, and any student who has not passed will receive an F. The registrar will note either result on the student's academic records, but will not use the course in computing the grade point average unless the student receives an F.
- This option is not available to students on probation.
- This option is available for a maximum of two courses in any one semester and one course during a summer session.
- Students receiving the grade of Pass in a course taken under the Pass/Fail option may not retake the same course for a letter grade.
- Courses taken under Pass/Fail option and courses taken by correspondence may not be used to fulfill graduation requirements for engineering students. Whether the courses are accepted for technology students is up to each major department.

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Good Standing

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Student Organizations & Services

Engineering and technology students have the opportunity to participate in the activities of the following student societies or chapters:

- American Society of Engineering Education (ASEE)

- American Society of Mechanical Engineers (ASME)
- Associated General Contractors of America (AGC)
- Biomedical Engineering Society
- Engineering and Technology Student Council
- Engineers Without Borders
- Formula SAE
- Global Design Students
- Institute of Electrical and Electronics Engineers (IEEE)
- Motorsports Club
- National Society of Black Engineers (NSBE)
- NET
- Pi Tau Sigma Honor Society
- SIGGRAPH
- Society of Hispanic Professional Engineers
- Society of Human Resource Management (SHRM)
- Society of Student Constructors (SSC)
- Society of Women Engineers (SWE)
- Student Design Organization (SDO)
- Tau Alpha Pi Honor Society
- Tau Beta Zeta

Minority Engineering Advancement Program (MEAP)

The Minority Engineering Advancement Program (MEAP) was established in 1974 to encourage minority students to pursue studies in engineering and engineering technology. Through the annual MEAP summer workshops, the school identifies and recruits talented secondary school students and provides them with information about engineering careers and college requirements. Since 1976, approximately 100 students participate each summer in the program.

MEAP also provides support services to minority undergraduates enrolled in the School of Engineering and Technology. In addition, some scholarships are available to American Indian, African American, and Hispanic students, people from groups that have been historically underrepresented in engineering and technology. For more information, students should contact the Office for Academic Programs, School of Engineering and Technology, 799 W. Michigan Street, IUPUI, Indianapolis, IN 46202-5160; www.engr.iupui.edu/meap; phone (317) 274-2943.

Opportunities to Study Abroad

The School of Engineering and Technology International Engineering Program offers credit and noncredit internship opportunities abroad. Internships are full-time positions, and work assignments last from the middle of May until the middle of July. These internships allow students to gain technical experience in international companies, knowledge of a foreign culture, improved foreign language skills, and other benefits of an intercultural experience. Juniors or seniors with grade point averages of 3.0 or higher and specific language skills are eligible to apply. Participants receive a stipend to cover a major part of their expenses. Living accommodations are arranged, usually with a host family. Free time for travel, study, and recreation is available at the end of the program. For more information, contact the Office for Academic Programs, School of Engineering and Technology, 799 W. Michigan Street, Indianapolis, IN 46202-5160; phone (317) 274-2533.

Individual departments also offer short- and long-term study abroad opportunities. Check with the department you're interested in to learn more about its study abroad programs.

Faculty

Administrative Officers

- **David Russomanno**, Dean
- **Wanda Worley**, Interim Associate Dean for Academic Affairs and Undergraduate Programs
- **M. Razi Nalim**, Associate Dean for Graduate Programs and Research
- **John Mainella**, Assistant Dean for Development and External Relations
- **Sherri Alexander**, Assistant Dean for Finance and Administration
- **Terri Talbert-Hatch**, Assistant Dean for Student Services
- **Eugenia Fernandez**, Chair of the Department of Computer, Information and Graphics Technology
- **Yaobin Chen**, Chair of the Department of Electrical and Computer Engineering
- **Elaine Cooney**, Chair of the Department of Engineering Technology
- **Jie Chen**, Chair of the Department of Mechanical Engineering
- **Stephen Hundley,** Chair of the Department of Technology Leadership and Communication Technology
- **Edward Berbari**, Chair of the Department of Biomedical Engineering
- **Wanda L. Worley**, Director of Technical Communication
- **Tim Diemer**, Director of International Services
- **Joe Abella**, Director of Industry Relations
- **Danny King**, Director of New Student Academic Advising Center
- **Marilyn Mangin**, Director of Student Recruitment
- **Jennifer Williams**, Director of Career Services and Professional Development

Faculty Emeriti

Akay, Hasan U., Chancellor's *Professor Emeritus of Mechanical Engineering (1981); B.S. Civil Engineering, 1967, Middle East Technical University, Turkey; M.S. Civil Engineering, 1969, Ph.D. Civil Engineering, 1974, University of Texas at Austin*

Ansty, William T., *Associate Professor Emeritus of Organizational Leadership and Supervision (1973); B.S. Foreign Service, 1955, Georgetown University; M.B.A. Business Administration, 1957, Harvard University*

Arffa, Gerald L., *Professor Emeritus of Organizational Leadership and Supervision (1979); A.A.S. Chemical Technology, 1950, Broome County Technical College; B.S. Chemical Engineering, 1955, Clarkson College of Technology; M.B.A. Production Management, 1958, Syracuse University; Ph.D. Administrative and Engineering Systems, 1980, Union College; P.E., New York*

Beck, Richard J., *Associate Professor Emeritus of Civil Engineering Technology (1962); B.S., Light Building, 1951, University of Wisconsin; M.S. Structures, 1959, University of Illinois; P.E., Indiana*

Bostwick, W. David, *Professor Emeritus of Organizational Leadership and Supervision (1976); B.S. Mathematics, 1961, Northern Illinois University; M.A. Educational Administration, 1964, Roosevelt University; Ph.D. Educational Administration, 1970, University of Kentucky (Deceased)*

Bluestein, Maurice*, Professor Emeritus of Mechanical Engineering Technology (1991); B.S. Mechanical Engineering, 1962, City College of New York; M.S. Mechanical Engineering, 1964 New York University; Ph.D. biomedical Engineering, 1967, Northwestern University*

Bowman, Michael S., *Associate Professor Emeritus of Mechanical Engineering Technology (1964); B.S. Mechanical Engineering, 1959, Purdue University; M.B.A. 1961, Indiana University*

Close, Sam, *Professor Emeritus of Mechanical Engineering Technology (1966); B.M.E. Mechanical Engineering, 1947, Cleveland State University; P.E., Indiana, Ohio (Deceased)*

Crozier, Robert G., *Professor Emeritus of Computer Technology (1972); B.S. Forestry, 1961, University of Missouri; M.S. Forestry, 1962, Ph.D. Entomology, 1966, Purdue University*

Dault, Raymond A., *Professor Emeritus of Restaurant, Hotel, Institutional, and Tourism Management (1950); B.A. Hotel Administration, 1950, Michigan State University; M.B.A. Management, 1969, Indiana University (Deceased)*

Dunipace, Kenneth R., *Professor Emeritus of Electrical Engineering (1977); B.S. Secondary Education, 1951, The Ohio State University; B.S. Mechanical Engineering, 1956, Massachusetts Institute of Technology; M.E. Electrical Engineering, 1965, University of Florida; Ph.D. Electrical Engineering, 1968, Clemson University; P.E., Massachusetts, Missouri*

Ecer, Akin, *Professor Emeritus of Mechanical Engineering (1979); B.S. Civil Engineering, 1966, M.S. Civil Engineering, 1967, Middle East Technical University, Turkey; Ph.D. Engineering, 1970, University of Notre Dame*

Eberhart, Russell*, Professor Emeritus of Electrical and Computer Engineering; B.S. Electrical Engineering, 1965, M.S. electrical Engineering, 1969, Ph.D. Electrical Engineering, 1972, Kansas State University*

Ebling, Daniel W., *Associate Professor Emeritus of Organizational Leadership and Supervision (1967); B.S. Economics, 1955, Albright College; M.B.A. General Business, 1956, Indiana University*

Fleenor, Edgar, *Professor Emeritus and Chair of Construction Technology (1997); B.S. Industrial Education, 1955, M.A. Education, 1960, Indiana State University; Ph.D. Education, 1974, The Ohio State University (Deceased)*

Gersting, John*, Computer and Engineering Science (1970), B.S. Engineering Science, Purdue University (1962); M.S. Engineering Science, Arizona State University (1964); Ph.D., Engineering Science, Arizona State University (1970)*

Goodwin, Clifford*, Associate Professor of Organizational Leadersyp and Supervision (1979); A.A.S. Aviation Technology, 1969; B.S. Supervision, 1970, Purdue University; M.S. Education, 1980, Ball State University; Ed.D., 1997, Indiana University*

Ho, Thomas I.M.*, Professor Emeritus of Computer and Information Technology (1999), Emertius, B.S. Computer Science, 1970, M.S. Computer Science, 1971, Ph.D. Computer Science, 1974, Purdue University*

Max, Abraham M., *Mechanical Engineering (1968); B.S., 1934, M.S., 1935, Ph.D., 1937, University of Wisconsin*

Maxwell, Michael P., *Associate Professor Emeritus in Construction Technology (1977); B.A.E. Architectural Engineering, 1955, University of Detroit; Reg. Architect, Indiana, Illinois*

Moll, Richard E., *Associate Professor Emeritus of Mechanical Engineering Technology (1958); B.S. Industrial Education, 1955, M.S. Industrial Education, 1963, Purdue University*

Naghdi, Amir K.,*Professor Emeritus of Mechanical Engineering and Mathematical Sciences (1966); B.S. Mechanical Engineering, 1951, University of Tehran, Iran; M.S. Mechanical Engineering, 1958, University of Illinois; Ph.D. Engineering Sciences, 1964, Purdue University*

Needler, Marvin A., *Professor Emeritus of Electrical and Computer Engineering Technology and of Electrical and Computer Engineering (1964); B.S. Electrical Engineering, 1963, M.S. Electrical Engineering, 1964, Purdue University; Ph.D. Systems Science, 1971, Michigan State University; Professional Engineer License, Indiana*

O'Loughlin, Carol L., *Associate Professor Emerita of Electrical Engineering (1984); B.S. Physics/Mathematics, 1957, Marquette University; M.S. Physics, 1962, Purdue University; Ph.D. Solid-State Physics, 1968, Tulane University; P.E., Indiana*

O'Loughlin, John R., *Professor Emeritus of Mechanical Engineering (1969); B.E. Mechanical Engineering, 1955, Youngstown State University; M.S. Mechanical Engineering, 1958, University of Pittsburgh; Ph.D. Mechanical Engineering, 1961, Purdue University; M.B.A. Business Administration, 1977, Indiana University; P.E., Indiana*

Orr, Robert H., *Professor Emeritus of Computer Technology (1985); B.S. Engineering Sciences, 1964, United States Military Academy; M.S. Information and Computer Science, 1973, Georgia Institute of Technology*Renda, R. Bruce, *Electrical and Mechanical Engineering (1974); B.S. Mechanical Engineering, 1952, M.S. Mechanical Engineering, 1957, Ph.D. Mechanical Engineering, 1957, Purdue University*

Peale, Robert*, Professor Emeritus of Mechanical Engineering Technology (1963), B.A. Mechanical Engineering, 1952;M.S. Industrial Engineering, 1953, Purdue University; P.E. Indiana; C.Mfg.E.*

Renda, R. Bruce*, Dean Emeritus and Professor Emeritus of Mechanical Engineering(1974); B.S. Mechanical Engineering, 1952; M.S. Mechanical Engineering, 1957; Ph.D. Mechanical Engineering, 1959, Purdue University*

Sharp, P. Kent, *Professor Emeritus of Electrical Engineering Technology (1966); B.S. Electrical Engineering, 1957,*

Rose-Hulman Institute of Technology; M.S. Electrical Engineering, 1964, University of Colorado; P.E., Indiana

Silence, Judith O., Retired Associate Professor of *Computer Technology (1978); A.B. Mathematics, 1962, M.S.Ed. Vocational Education, 1982, Indiana University*

Sinha, Akhouri S. C., *Professor Emeritus of Electrical Engineering (1977); B.S. Mathematics, 1957, Bihar University, India; B.S. Electrical Engineering, 1961, Banaras Hindu University, India; M.S. Electrical Engineering, 1966, Ph.D. Electrical Engineering, 1969, University of Missouri*

Solinski, Edward M., *Associate Professor Emeritus of Computer Technology (1973); B.S. Engineering, 1960, Cleveland State University; M.S. Engineering Administration, 1964, Case Western Reserve University*

Tharp, Robert E., *Associate Professor Emeritus of Mechanical Engineering Technology (1969); A.A.S. Mechanical Engineering Technology, 1960, B.S. Industrial Education, 1965, M.S. Industrial Education, 1968, Purdue University; C.Mfg.E.*

Westcott, Roy E., *Professor Emeritus of Mechanical Engineering Technology (1981); B.S. Industrial Education, 1979, Purdue University; M.S.Ed. Vocational Education, 1981, Indiana University (Deceased)*

Wilkins, Harriet A., *Associate Professor Emerita of Technical Communication (1983), and Associate Professor of English (1996); B.A. English, 1959, College of Emporia; M.A. Linguistics, 1975, Louisiana State University; Ph.D. Language Education, 1991, Indiana University*

Yokomoto, Charles F., *Professor Emeritus of Electrical and Computer Engineering (1970); B.S. Electrical Engineering, 1964, M.S. Electrical Engineering, 1966, Ph.D. Electrical Engineering, 1970, Purdue University*

Yurtseven, H. Oner, *Dean Emeritus and Professor Emeritus of Electrical and Computer Engineering (1977); B.S. Electrical Engineering, 1967, Middle East Technical University, Turkey; Ph.D. Electrical Engineering, 1974, The Johns Hopkins University*

Resident Faculty

Acheson, Douglas, *Associate Professor of Computer Graphics Technology (1997); B.S. Technical Graphics, 1993, M.S. Educational Computing, 1995, Purdue University*

Albright, Bruce Randall, *Lecturer of Music; B.A., 1992, Indiana University Bloomington; M.S.M.T., 2002, Indiana University-Purdue University Indianapolis*

Alfrey, Karen, *Lecturer of Biomedical Engineering, Director of the Undergraduate Program in Biomedical Engineering, B.S.E.E. 1993 Cornell University; M.S. 1997 Rice University; Ph.D. 2000 Rice University*

Alvarado, John, *Lecturer of Music; B.M. in Classical Guitar Performance, 1998, DePaul University; M.M. in Performance, 2000, Arizona State University*

Anthony, Thomas, *Visiting Assistant Professor (2012); Bachelor of Electrical Engineering, 2003, Florida A&M University; M.S. Industrial Engineering, 2006, Ph.D. Industrial Engineering, 2012, Florida State University*

Anwar, Sohel, *Associate Professor of Mechanical Engineering (2004); B.S. in Mechanical Engineering, Bangladesh University of Engineering & Tech, 1986, M.Sc.Eng. in Mechanical Engineering, Bangladesh University of Engineering, 1988, M.S. in Mechanical Engineering, Florida State University, 1990, Ph.D. in Mechanical Engineering, The University of Arizona, 1995, Professional Engineer (P.E), Michigan, 2004*

Bailey, Darrell, *Professor of Music; B.M. in Organ Performance, 1974, B.A. in Music, 1975, M.M.T., 1976, Oberlin College; D.M.E. University of Illinois at Urbana-Champaign*

Baldwin, Daniel, *Clinical Assistant Professor of Computer Graphics Technology (2006), B.F.A, Painting, 1996, Indiana University; M.F.A, Illustration, 2000, Savannah College of Art and Design*

Bannatyne, Mark, *Associate Professor of Computer Graphics Technology (2004), B.S., Trade & Technical Education, 1988, Utah State University; M.S., Technology Education, 1992, Utah State University; Ph.D., Curriculum and Instruction, 1997, Purdue University*

Berbari, Edward, *Chancellor's Professor of Biomedical Engineering, Chair of Department of Biomedical Engineering, and Professor of Medicine (1994); B.S.E.E. Electrical Engineering, 1971, Carnegie-Mellon University; M.S. Biomedical Engineering, 1973, University of Miami; Ph.D. Electrical Engineering, 1980, University of Iowa*

Burns, Debra, *Associate Professor of Music; B.A. in Music Education, 1987, Glenville State College; M.M. in Music Therapy, Illinois State University; Ph.D. in Music Education and Music Therapy, 1999, University of Kansas*

Catlin, Sally, *Lecturer of Computer and Information Technology (2003); B.A. History, 1986, University of California; M.S. Education, 2003, Indiana University*

Chen, Jie, *Professor of Mechanical Engineering, Chair of the Department of Mechanical Engineering, Professor of Orthodontics, School of Dentistry (1990); B.S. Mechanical Engineering, 1982, Tianjin University, China; M.S. Biomedical Engineering, 1984, Shanghai Second Medical College, China; Ph.D. Mechanical Engineering, 1989, Drexel University*

Chen, Rongrong, *Associate Professor of Mechanical Engineering Technology (2008), B.S. Physical Chemistry, 1983, Xiamen University, Ph.D. Electrochemistry, 1993, Case Western Reserve University*

Chen, Yaobin, *Professor of Electrical and Computer Engineering, Chair of the Department of Electrical and Computer Engineering (1990); B.S. Electrical Engineering, 1982, Nanjing Institute of Technology, China; M.S. Electrical Engineering, 1986, Ph.D. Electrical Engineering, 1988, Rensselaer Polytechnic Institute*

Chien, Y. P. Stanley, *Professor of Electrical and Computer Engineering (1989); B.S. Electrical Engineering, 1984, University of Wisconsin; M.S. Electrical Engineering, 1985, Ph.D. Electrical and Computer Engineering, 1989, Purdue University*

Choe, E.J., *Assistant Professor of Music and Director, IUPUI Music Academy; B.M. in Piano Performance, 1987, M.A. in*

Piano Performance and Pedagogy, 1990, The University of Colorado at Boulder; D.M. in Piano Pedagogy and Literature, 2008, Indiana University Bloomington

Christe, Barbara, *Associate Professor*, *Program Director of Biomedical Engineering Technology Program (1998); B.S. Engineering, 1984, Marquette University; M.S. Clinical Engineering, 1986, Rensselaer at Hartford; PhD ABD, Higher Education Administration, 2013, Marquette University* (* Anticipated Graduation, May 2013)*

Christopher, Lauren, *Assistant Professor of Electrical and Computer Engineering (2008); B.S. Electrical Engineering, 1982, Massachusetts Institute of Technology; M.S. Electrical Engineering, 1982, Massachusetts Institute of Technology; Ph.D. Electrical Engineering 2003; Purdue University*

Chu, Tien-Min (Gabriel), *Assistant Professor of Biomedical Engineering (2003); D.D.S. Dental Surgery, 1989, Kaohsiung Medical College, Ph.D. Materials Science, 1999, University of Michigan*

Clark, Jerome A., *Lecturer of Computer and Information Technology (1999); B.S. Computer Technology, 1992, IUPUI; M.S. Management 1996, Indiana Wesleyan University*

Conrad, William, *Professor of Electrical and Computer Engineering Technology (1991); B.S.E.E., 1966, Purdue University; M.Eng., General Engineering, 1968, Pennsylvania State University; P.E., Indiana*

Cooney, Elaine, *Professor of Electrical and Computer Engineering Technology (2005), Chair of Engineering Technology (2009); Bachelor of Electircal Engineering, 1984, General Motors Institute; M.S.E.E. 1986, Purdue University*

Cowan, David J., *Associate Professor of Architectural Technology (2009); B.A. Visual Arts, 1973, University of Saskatchewan, Canada; B.Ed. Secondary, 1976, University of Regina, Canada; M.E.Des(Arch.) Architecture, 1986, University of Calgary, Canada; Ph.D. Architecture 2006, University of Calgary, Canada*

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