

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

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Advisory Board

The Advisory Board for the School of Engineering and Computer Science is composed of leaders in industry. They assist the school in developing educational and research programs to meet the rapidly expanding requirements in the technical world. The board is available as a body or individually for consultation on such matters as curriculum, research, facilities, equipment requirements, special subjects and long-range planning. Board members are:

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Mission

The overall mission of the School of Engineering and Computer Science is threefold:

- to provide high-quality undergraduate and graduate programs of instruction in engineering and computer science to prepare graduates for careers in the coming decades,
- to advance knowledge through basic and applied research in relevant branches of engineering and computer science, and
- to provide service to both the engineering profession and public of the state of Michigan.

- In carrying out its mission the School will address the needs of the automotive and related industries in southeast Michigan for the:
- education of engineers and computer scientists,
- development of research programs and
- fulfillment of the demands for professional service.

General Information

Accreditation

The undergraduate programs in computer, electrical and mechanical engineering, are accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012-telephone (410)347-7700. The computer science program is accredited by the Computing Accreditation Commission (CAC) of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012-telephone (410)347-7700.

Undergraduate programs

The School of Engineering and Computer Science offers instruction leading to the degrees of Bachelor of Science in Engineering, with majors in computer, electrical, industrial and systems, and mechanical engineering, and Bachelor of Science, with a major in computer science, and information technology. In addition, programs leading to the Bachelor of Science degree in engineering chemistry and engineering physics are offered jointly with the College of Arts and Sciences.

Through its engineering programs, the School of Engineering and Computer Science prepares students for careers in an industrial-based society. Recognizing that today's engineers must be able to solve complex, highly focused problems, as well as those transcending narrow fields of specialization, the School of Engineering and Computer Science blends an interdisciplinary core with specialized study in the elected major for each program.

Oakland University engineering graduates are prepared to enter the traditional fields of government, product design, development, manufacturing, sales, service and systems analysis — as well as specialized areas, such as robotics, transportation, pollution control, energy systems, computer engineering, communications, medical electronics and automotive engineering. They are also prepared to pursue graduate study for careers in research and teaching. A growing number of students find their undergraduate engineering education is excellent preparation for careers in business, law and medicine.

The baccalaureate program in computer science provides a solid foundation for a career in that field. Since both the engineering and computer science programs are offered within the school, computer science majors are exposed to the software as well as the hardware aspects of the profession. Thus, students in the computer science program prepare themselves for careers in the traditional fields of systems programming, data processing and systems analysis, as well as in such interdisciplinary fields as artificial intelligence, robotics, computer architecture, computer graphics, pattern recognition and scientific computation.

The baccalaureate program in information technology is focused on the applied aspects of software technology. The program provides sufficient technical depth and a comprehensive understanding of information technology in the context of problem solving relevant to both engineering and service industries.

The School of Engineering and Computer Science also offers minors in computer science and in computing or information technology for non-engineering majors.

Professional societies

The school has a number of professional societies such as the Association of Computing Machinery (ACM), Association of Unmanned Vehicle Systems (AUVS), American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), Society of Automotive Engineers (SAE), Society of Manufacturing Engineers (SME), Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), National Society of Professional Engineers (NSPE), Theta Tau

fraternity and honor societies Eta Kappa Nu and Tau Beta Pi. Students are encouraged to become active members of one or more of these organizations.

Graduate programs

The School of Engineering and Computer Science offers programs leading to the Master of Science degree in computer science and engineering, electrical and computer engineering, embedded systems, industrial and systems engineering, information systems engineering, mechanical engineering, software engineering, and the Doctor of Philosophy degrees in mechanical engineering and systems engineering. The latter involves a blending of various disciplines. The school also offers a Master of Science degree in engineering management in cooperation with the School of Business Administration. For more information, see the *Oakland University Graduate Catalog*.

Centers/Institutes

Center for Robotics and Advanced Automation (CRAA)

The School of Engineering and Computer Science has a Center for Robotics and Advanced Automation. The main goals of the center are to contribute to the demand for high technology and industrial productivity in the United States.

Fastening and Joining Research Institute (FAJRI)

Fastening and joining significantly affects the safety, quality and reliability of many mechanical and structural systems, machinery and equipment. The FAJRI is the only known academic facility of its kind in the world dedicated solely to the research and development of fastening and joining of materials in industries such as automotive, aerospace and nuclear. The research programs at FAJRI benefit both the commercial and defense sectors of the economy while improving the safety of the public.

Product Development and Manufacturing Center (PDMC)

Global competition in manufacturing mandates continual improvement in technology, business processes and employee capabilities. The manufacturing enterprise must also consider interdependencies between these three factors when affecting change. In recognition of this dynamic, the Product Development and Manufacturing Center at Oakland University focuses on improving the competitiveness of the automotive industry and its suppliers through application of new and existing technology, modified business practices and new educational and training paradigms.

Admission

High school preparation

Entering freshmen planning to major in engineering, computer science should have taken at least four years of high school mathematics, including trigonometry. A solid background in English composition is essential for all majors. Additional preparation should include course work in chemistry and physics. Drafting, machine shop practice, computer programming and electronics shop courses are useful, but are not required for admission. Freshman planning to enter program in information technology should have at least three years of high school mathematics with some preparation in science. Normally, a 3.00 (B) grade point average is required for admission to programs in the School of Engineering and Computer Science.

Transfer policy

The programs offered by the School of Engineering and Computer Science are designed to meet accreditation criteria, as well as to reflect the Oakland University philosophy of education. The programs are more than an assemblage of courses; they are designed to blend theory and experiment, and to integrate fundamental mathematical and scientific background into advanced analysis and design work.

To ensure the integrity of its programs, the School of Engineering and Computer Science has adopted the following transfer policy: Records of students transferring to Oakland University from other

academic institutions are evaluated and transfer credit is granted as appropriate. Once matriculated at Oakland, students are expected to complete all remaining course work for the degree at Oakland University. Students who plan to take courses at other universities must have prior written consent of the chair of their major department. Students may transfer applicable community college credits at any time during their course of study. However, at least one-half of the credits required for completion of a specific baccalaureate degree program must be from regionally accredited four-year institutions, with at least 32 credits earned at Oakland University.

Students planning to transfer into one of the engineering programs should present the following: four semester courses in analytic geometry and calculus, including linear algebra and differential equations; two semester courses in introductory college physics using calculus; and one or two semester courses in chemistry. Other credits in mathematics, science or engineering will be evaluated with reference to engineering graduation requirements. Technician course credits generally do not apply to these requirements. Community college students who plan to transfer into an engineering program are advised to follow the transfer equivalency guides found on the Oakland University's web site. Students planning to transfer from Macomb Community College (MCC) under the two-plus-two program must meet specific requirements that are available in detail from the Admissions Office at MCC or SECS Advising Office at Oakland University. Students planning to transfer into the computer science program should complete one year of course work in calculus, one course in linear algebra, one course in discrete mathematics if possible and two semester courses in introductory college physics using calculus. A course in programming in a high-level language is desirable. Whenever possible, further course work in computer science should be planned with an Oakland University adviser to ensure compatibility with university requirements. Students transferring into the information technology program should include a course in calculus, a course in statistics, and a course in science elective. A course in programming in a high level language is also desirable.

Transfer students from non-ABET-accredited foreign institutions must complete a minimum of 20 credits in their major program of study (professional subjects) at Oakland University including the capstone design course. All of the courses presented for transfer from such programs must receive approval of the specific Departmental Undergraduate Affairs Committee, before student receives official transfer credit. See Transfer student information for additional information.

Internal transfer

Oakland University students wishing to transfer into engineering or computer science programs in the School of Engineering and Computer Science from other majors or from undecided status will be considered upon the completion of the following courses: MTH 154, 155; PHY 151 and 152. Similarly, students wishing to transfer into the information technology program will be considered upon completion of MTH 154 or 122, STA 227, APM 163 and a proper science elective.

Academic advising and plans of study

The programs of study for all entering freshmen are focused toward acquiring math, science, writing and programming skills and thus follow a more or less uniform pattern. One of the early courses taken by engineering students is EGR 120, Engineering Graphics and CAD that introduces students to the special software tools used in engineering. Upon acquiring major standing (see below), students are assigned to a faculty adviser. It is mandatory for the students to consult their faculty advisers to plan a meaningful program of professional study in their major immediately after major standing has been granted.

In order to further facilitate the student-faculty interaction, one week of each fall and winter semester is designated as "Advising Week." Failure to meet with his/her adviser at least once during each fall and winter semester will result in a hold being placed on the student's registration for the succeeding semester.

In consultation with the faculty advisers, students should ensure that they satisfy all of the requirements of their programs of study.

The school's academic advising office oversees specific program requirements. Students who have questions about transfer credit, academic standing, major standing, petitions or the details of degree

requirements should consult the academic adviser in 159A Dodge Hall. Students of the School of Engineering and Computer Science must complete a Plan of Study form, which is a timetable of courses to be taken for undergraduate credit. They should complete the form as early as possible, but no later than the end of the semester in which they complete 48 credits. Transfer students should consult with an academic adviser when they enter Oakland University, and complete a Plan of Study form.

Students are responsible for updating their plans regularly, preferably each semester. Although advisers are obligated to help students plan their programs, the responsibility for fulfilling degree requirements remains with students.

Degree Requirements

General requirements for the baccalaureate degrees

The following general requirements must be met by students seeking a bachelor's degree in computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, engineering chemistry, engineering physics, computer science and information technology:

1. Complete at least 128 credits for all programs. At least 32 credits must be in courses at the 300 level or above.
2. Complete at least 32 credits at Oakland University. (Refer to the transfer policy of the School of Engineering and Computer Science for further clarification.) The credits taken at Oakland must include the following for students majoring in:
Computer, electrical, industrial and systems, mechanical engineering: at least 24 credits in engineering core or professional subjects required for the major,
Engineering chemistry and engineering physics: at least 16 credits in required engineering courses, and 16 credits in chemistry or physics courses required for the major;
Computer science: at least 24 credits in computer science courses required for the major.
Information Technology: at least 24 credits in information technology courses required for the major.
3. Take the last 8 credits needed to complete baccalaureate requirements at Oakland University.
4. Fulfill the university general education requirement (see below *and Undergraduate degree requirements*).
5. Be admitted to major standing in the major of the student's choice.
6. Complete the requirements specified for the elected major.
7. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University.
8. Complete an Application for Degree at the Office of the Registrar and pay the graduation service charge.

Writing foundation, writing intensive, and U.S. diversity

The baccalaureate degree requirements include completion of WRT 160, with a grade of 2.0 or higher to satisfy the university general education requirement in writing as part of the foundations area. Students who believe their skills warrant exemption from WRT 160 may also submit a portfolio. (*please refer to the Oakland University Undergraduate Degree Requirements section of this catalog*). Students must also satisfy requirements for a writing intensive course in general education, a writing intensive course in the major, a U.S. diversity course, and a capstone course (*please refer to the Oakland University Undergraduate Degree Requirements section of this catalog*).

General education requirements

The General Education requirements are comprised of three parts: Foundations, Exploration, and Integration. In addition, Diversity requirements must also be met. For details, see page 55 of this catalog.

Foundations:

- (1) Writing foundations as indicated above.
- (2) Formal Reasoning *

Exploration:

- (3) Art
- (4) Foreign Language and Culture
- (5) Global Perspective
- (6) Literature
- (7) Natural Science and Technology*
- (8) Social Science
- (9) Western Civilization

Integration:

- (10) Knowledge Applications*

Capstone*

Diversity: may be met by an approved course in Explorations area.

*SECS students with majors in engineering and computer science, satisfy these areas by virtue of their required courses. However, information technology majors must take a course from the natural science and technology knowledge exploration area. A course may be selected such that it also satisfies science elective requirement of the IT program.

Engineering core

All engineering programs in the School of Engineering and Computer Science have a common core program consisting of the following courses :

EGR 120	Engineering Graphics and CAD (1)
EGR 141	Computer Problem Solving in Engineering and Computer Science (4)
EGR 240	Introduction to Electrical and Computer Engineering (4)
EGR 250	Introduction to Thermal Engineering (4)
EGR 260	Introduction to Industrial and Systems Engineering (4)
EGR 280	Design and Analysis of Electromechanical Systems (4)

This core program introduces students to the nuances of the interdisciplinary nature of engineering and lays the foundations for the specialized studies in the student's major fields of study. These courses also provide substantial, real world laboratory experiences to students. It is important that students successfully complete these courses in order to achieve major standing (see below).

Major standing

To enroll in 300- or 400-level courses and to become candidates for the baccalaureate degree, students of the School of Engineering and Computer Science must gain major standing in their selected majors. An application for major standing should be submitted during the semester in which students complete all requirements for the major standing. Students lacking major standing may enroll in 300- or 400-level engineering, computer science and information technology courses only by presenting at registration an approval form signed by the academic adviser. The purpose of this process is to ensure that students can

complete outstanding deficiencies preventing achievement of major standing. Forms may be obtained in the advising office (159A Dodge Hall).

To gain major standing requires completion of writing foundations (see above) and satisfactory completion of course work in mathematics, science and the major, as designated below.

Engineering:

Mathematics: MTH 154-155, APM 255. Science: CHM 143; PHY 151, 152. Engineering Core : EGR 120, 141, 240, 250, 260 and 280.

Computer Science:

Mathematics: MTH 154-155, 275; APM 263, Science: PHY 151, 152, Major: EGR 141, 240; CSE 230, 280.

Information Technology:

Math/Science: MTH 154 or 122, STA 227; APM 163, science elective. Major: CIT 130, 220, 230, 247, 251, 280.

Engineering Biology:

Math/Science: MTH 154-155, APM 255, Science: PHY 151, 152, BIO 111-113. Major: EGR 120, 141, 240, 250, 280, BIO 325.

Engineering physics:

Mathematics: MTH 154-155, APM 255. Science: CHM 143; PHY 151, 152, 158. Major: EGR 120, 141, 240, 250, 260, 280.

Engineering chemistry:

Mathematics: MTH 154-155, APM 255. Science: CHM 157-158 or 162-163; 147-148. Major: EGR 120, 141, 240, 250, 260, 280.

To complete the requirements for major standing satisfactorily a student must a) have an average of at least 2.00 in each of the mathematics, science or math/science (for IT) and core/major course groupings, b) have no more than two grades below 2.0 in the required courses; c) not have repeated any course more than twice; and d) not have repeated more than three different courses. Courses in which a W (withdrawal) grade is recorded will not be counted.

Major standing may be granted in the semester in which the student is enrolled in the EGR 280 (for engineering majors), CSE 280 (for CS majors) or CIT 280 (for IT majors). Transfer students may satisfy the requirements for major standing by using transfer credits.

Typical schedule for first two years

	Fall	Winter
Year 1	MTH 154 CHM 143 EGR 120 EGR 141 Gen. Ed.	MTH 155 PHY 151 EGR 240 Gen. Ed.
Year 2	APM 255 PHY 152 EGR 250 Gen.Ed./CSE 230	MTH 254/APM 263 EGR 260 EGR 280 Gen.Ed./CSE 231

Scheduling for subsequent years depends on students' selected majors, but should be tailored to meet the requirements for admission to major standing promptly. For sample schedules, refer to the department listings in this catalog or to the student handbook of the School of Engineering and Computer Science.

Students who are not prepared to enter the mathematics and science courses without additional preparation in these subject areas must modify their schedules accordingly. Such students may require additional time to complete degree requirements, unless they make up the deficiencies by enrolling during the summer semester following the freshman year.

Course load

Students should strike a balance between course load and other commitments. In general, students carrying a full load of 16 credits per semester should not be employed for more than 10 to 20 hours per week. Students who are employed 40 hours per week generally should not carry a course load of more than 4 credits per semester. The university's maximum course load policy is detailed in the *Academic Policies and Procedures* section (see *Course and credit system*).

Graduation check

To ensure that students have met all requirements, they must participate in a final program audit during the semester preceding the one in which they expect to graduate. A preliminary Graduation Review form should be submitted to the Academic Adviser in 159A, Dodge Hall.

Cooperative education

General information

Students in the School of Engineering and Computer Science who want to combine relevant work experience with their college education are encouraged to participate in the university's cooperative education program. Co-op employment provides practical training related to a student's field of study and forms an integral part of the educational program. It enables students to relate their academic studies with practical applications, and it gives them early contact with practitioners in their fields.

Requirements of the cooperative education program

Students interested in the cooperative education program in engineering, computer science or information technology should apply through the office of the cooperative education coordinator, 275 Vandenberg Hall, (248)370-3250.

To be admitted, students must:

1. Be granted major standing (see above), or file an approved plan for achieving major standing, signed by the academic adviser.
2. Normally, have a cumulative grade point average of at least 2.80.
3. Have the approval of the academic adviser, the cooperative education coordinator for the school and the employer.

Transfer students must have completed at least one semester of full-time study at Oakland University before acceptance into the program.

To remain in good standing in the cooperative education program, students must:

1. Complete alternate semesters of full-time study and full-time work or participate in a parallel co-op, taking a reduced course load while working part-time.
2. Complete at least 8 to 12 credits of course work appropriate to their elected major during each semester of study, maintaining a cumulative grade point average of at least 2.80.
3. Submit a satisfactory training report within four weeks of the beginning of the semester following each co-op assignment.
4. Receive a satisfactory employer evaluation for each assignment.

Students who do not meet the conditions for good standing will be subject to dismissal from the co-op program. The co-op program is administered by the Department of Career Services.

Double major

To earn two majors in engineering or in engineering and computer science, students must complete all requirements of both programs. Further, in addition to the credit hours needed for one major, the student must complete a minimum of 12 credit hours in pertinent technical courses applicable to the second major. Students seeking two degrees should consult the university's requirements (see *Additional undergraduate degrees and majors*).

Minors and concentrations

Students who wish to add a minor or concentration or otherwise participate in an interdepartmental program must apply for admission and seek assistance in planning a program. Application may be made to the coordinator of the appropriate program committee or department involved.

Students in the School of Engineering and Computer Science might be interested in the following minors or concentrations: Applied mathematics, applied statistics, biology, chemistry, economics, environmental studies, linguistics, and physics. For details see *Other Academic Options* in the College of Arts and Sciences portion of the catalog.

Other areas of interest might be: accounting, finance, general business, management information systems, production and operations management, and quantitative methods. For details on these, see *Minors* in the School of Business Administration portion of the catalog.

The School of Engineering and Computer Science offers the following minors:

International orientation for engineering/computer science students

Coordinator: *Bhushan L. Bhatt*

In view of the ever-increasing globalization of industry, students in engineering and computer science need to be aware of their international opportunities and also to develop an intellectual background that enhances their ability to respond to professional challenges in the global environment.

To obtain a minor in international orientation for engineering/computer science students, students must complete the following courses with a grade of at least 2.0 in each course:

Introductory course (4 credits): IS 210, 220, 230, 240, 250, 260; HST 341

Foreign language consistent with the introductory course (8 credits)

ECN 200 or 210 (4-6 credits)

One advanced course (4 credits) from PS 314 or ECN 373

EGR 496 (4 credits), which requires eight weeks of study/work abroad.

Some of the courses listed above also satisfy general education requirements. This minor is open to the students in the School of Engineering and Computer Science.

Minors in computer science, computing, or information technology for non-engineering majors are also offered. For details see the listing in the Department of Computer Science and Engineering portion of this catalog.

Additional information

Prerequisite courses

In planning their schedules, students should ensure that they satisfy prerequisite and corequisite conditions for courses, as listed under “Course Offerings.” Students will have their registrations cancelled if they register for courses for which they do not meet the conditions. Students will be liable for any financial penalties incurred by such cancellation.

Project and independent study courses

Project and independent study courses numbered 490 and 494 are available to provide enrichment opportunities to qualified students. They are not intended as substitutes for regular course offerings; rather, they allow students to investigate areas of interest outside the scope of regular courses, examine subjects more deeply than can be accommodated in regular courses, or gain educational experiences beyond that of regular course work. To register for a project or independent study course, students must first submit a plan of work to the faculty member who will supervise the course. The plan must be approved in writing by the faculty member and the chair of the major department before students may register for the course.

Application forms are available in the departmental offices.

Petitions

Waivers of specific academic requirements may be initiated by submitting a petition of exception (see *Petition of exception*).

Students seeking a review of their academic standing within the school or students who wish to make a formal complaint should submit a written petition to the chair of their major department or to the associate dean. Petitions will be processed according to established university procedures.

Academic conduct

Students are expected to abide by the principles of truth and honesty, which are essential to fair grading. Academic misconduct in any form is not permitted. Students who are found guilty of academic misconduct as determined by the university Academic Conduct Committee, in any course offered by the school, may be subject to penalties that range from a reduced grade for the assignment, a grade of 0.0 for the entire course, academic probation, suspension or dismissal from the university. All assignments must be the independent work of each student, unless the professor of the course gives explicit permission relaxing this requirement.

See the *Academic Conduct Policy* section of the catalog for more detailed information.

Academic standing

The performance of students in the School of Engineering and Computer Science will be reviewed at the end of each semester to determine academic progress.

Good academic standing in the school requires a cumulative grade point average of at least 2.00 in: a) courses required for the major; b) cognate courses in mathematics and science; and c) all courses taken at Oakland University. Students whose cumulative grade point averages fall below 2.00 in one or more of the three categories will be placed on provisional status.

While on provisional status, students must have their programs of study approved by the chair of their major department. Students who fail to remove provisional conditions after one semester are generally ineligible to continue their programs. However, provisional status may be continued if students are judged to be making substantial progress toward correcting the deficiency. (For part-time students, 12 consecutive credits of course work will be considered equivalent to one semester.)

Students on provisional status may not serve on committees of the School of Engineering and Computer Science.

Students who become ineligible to continue enrollment in the School of Engineering and Computer Science may transfer to another school or college within the university subject to their requirements.

The above rules were established by the undergraduate curriculum committee of the School of Engineering and Computer Science. Students wishing to appeal a ruling on their academic status must address a written petition to the School's committee on academic standing. Petitions may be submitted to the academic adviser or the associate dean.

Unsatisfactory performance

Unsatisfactory (U) grades and grades less than 2.0 are considered substandard. A student within the School of Engineering and Computer Science who repeats a course in which a grade below 2.0 has been earned must repeat that course at Oakland University. Courses in which a grade below 2.0 has been earned may not be subsequently passed by competency examination or independent study. See *Repeating courses* for additional information.

Honors, awards and scholarships

The School of Engineering and Computer Science, may in its discretion, confer departmental honors on students who have completed a minimum of 62 credits in the School and demonstrated a high level of scholarly accomplishment by achieving a GPA of 3.50 in SECS courses.

Each year the faculty selects graduating seniors to receive four special awards: Exceptional Achievement, Academic Achievement, Professional Development, and Service. Details are described in the SECS undergraduate student handbook available on the SECS web site. In addition to scholarships available to all Oakland University students, the following are available specifically to SECS students:**

DeVlieg Foundation Scholarships: Awarded annually to both undergraduates and graduate students by the Department of Mechanical Engineering, these scholarships are merit based in amounts ranging from \$1,000 to \$5,000.

MSPE Scholarship: A \$1,000 scholarship is awarded annually to a student in the SECS. Application is filled with the Michigan Society of Professional Engineers.

NHK International Corporation Scholarship: This endowed scholarship of \$2,000 is awarded to a full-time SECS graduate or undergraduate student whose GPA is a minimum of 3.20 and who has demonstrated professionalism, the ability to collaborate with others and a potential to contribute to the quality of academic and student life.

Oakland University Engineering Scholarship: Awarded to entering engineering or computer science students based upon a minimum high school GPA of 3.50 and scores on a standardized test, these scholarships may be renewed for a total of eight semesters to recipients who maintain a 3.00 GPA and continue to major in engineering or computer science.

SAE Engineering Scholarship: This \$1,000 scholarship is awarded annually to an entering freshman with high academic credentials and involvement in extra curricular or community activities. Application is filed with the Society of Automotive Engineers.

Society of Women Engineers: Open to undergraduate and graduate students majoring in Mechanical Engineering or Electrical & Computer Engineering and are members of the Society of Women Engineers. Undergraduate GPA greater than 3.50, Graduate GPA: 3.70. Good communication + leadership skills, as well as community involvement.

Thomas A. Yatooma Memorial Scholarship: provided by the SECS Alumni Affiliate, up to four \$1,000 scholarships are awarded annually to engineering or computer science majors. Applications are available in February from the SECS advising office and the alumni office.