The School of Technology prepares graduates in professional technological fields. The only public school of technology in the state of Connecticut, it consists of five departments: Biomolecular Sciences, Computer Electronics and Graphics Technology, Engineering, Manufacturing and Construction Management, and Technology Education. The school offers degrees in biomolecular science, engineering technology, and technology, leading to a wide variety of careers. In conjunction with the School of Education and Professional Studies, the BS degree (in education) prepares individuals for teaching careers in technology education.

The school provides students with an opportunity to be educated in these dynamic fields of science and technology. They will develop an understanding of computers, tools, materials, and instrumentation; how industry changes the forms of materials, energy, and information to increase their value in society; how industry develops products and distributes and services products; how to conduct research; and industrial organization and management. Biomolecular science students will be prepared for careers in molecular biological research, graduate study in the molecular life sciences, or professional training in medicine or health-related fields.

Designated as a “Center of Excellence” by the state of Connecticut, CCSU’s School of Technology has taken great pride in its ability to offer a broad range of curriculum options that provide students with a careful balance of classroom theory and practical application.

Biomolecular Sciences

Faculty

Department Overview
The Department of Biomolecular Sciences offers instruction in molecular biology, microbiology, cell biology, genetics, development, and physiology that is strongly integrated with the theory and practice of molecular biological research. The department offers two BS degrees in biomolecular sciences and participates in an additional interdisciplinary program that leads to a BS degree in biochemistry. In addition, the department offers a minor in biomolecular science appropriate for students with majors other than biomolecular science. In addition, the department is pleased to offer health-related courses to support undergraduate programs in gerontology, nursing, physical education, athletic training, and other non-science majors.

Student-centered research is a feature of all undergraduate programs in biomolecular sciences. Located in Copernicus Hall, the Department of Biomolecular Sciences includes a wide range of modern research equipment in laboratories designed both for class instruction and for independent student research. Special facilities include a protein purification and analysis facility, a cell culture facility, a molecular genetics research laboratory, a laboratory animal care suite, a microbiology laboratory that is certified by the CT State Department of Public Health, and several computer laboratories. Student-centered biomolecular research activity is also promoted, fostered, and supported by the Biotechnology Institute at CCSU, an interdisciplinary organization (housed in the Department of Biomolecular Sciences) that is dedicated to developing college graduates with excellent research skills. The Department of Biomolecular Sciences is strongly committed to student advising and routinely promotes and participates in academic and extracurricular activities aimed at facilitating student learning and success.

Programs

MAJOR IN BIOMOLECULAR SCIENCES, BS (Non-teaching)

Core (11 credits):
BMS 102 and 103, 190, 201, 290, 390, and 491, and one of the following advanced components. BIO 121 may be substituted for BMS 102/103.

Advanced Component Options (35 credits required in the major)

General Program
This program offers a curricular focus on molecular and cellular mechanisms that is integrated with organismal physiology and emphasizes hands-on learning through laboratory instruction and independent student research. This degree is appropriate for students wishing to prepare for professional training in medicine or for graduate study in such areas as genetics, microbiology, molecular biology, or cell physiology.

This program requires completion of the core; plus three laboratory courses, including BMS 306, 311, 316; and additional directed electives to complete 35 credits in the major, chosen from BMS 318, 319, 320, 322, 391, 412/413, 414, 415, 416, 490, 495, 496/497, 499, CHEM 320, 354/455, 456, BIO 416, or 449/450.

Biotechnology Specialization
This program offers a strong focus on the principles of cell and molecular biology and emphasizes the practice of biomolecular research. It is designed to prepare students for advanced study in the biomolecular sciences or careers that use the concepts and techniques of molecular and cellular biology.

This program requires completion of the core; plus four laboratory courses, including BMS 306, 311, 316, 495; and additional directed electives to complete 35 credits in the major, chosen from BMS 320, 391, 415, 416, 490, 496/497, 499, CHEM 354/455, 456, or BIO 449/450.

Related Requirements (16–28 credits):
In addition to the 35 credits in the major, made up of the core and one of the advanced components described above, the student must take MATH 119 and 125 or 152; CHEM 161, 163, 210, 211, 212, and 213; PHYS 121 and 122; and maintain a student portfolio. While no minor is required for the BS in biomolecular sciences, a minor in science may be elected with a C- or better in related requirement courses CHEM 161, 162, 163, 164, PHYS 121, and 122. Some related requirement courses may also be counted to fulfill appropriate portions of the student’s General Education program.

Double-listed Courses
BMS 318, 319, 412, and 413 are also listed in the course description section of the catalog with a BIO designator. These double- or cross-listed courses (i.e., BMS 318 and BIO 318) are considered fully equivalent.
MAJOR IN BIOCHEMISTRY, BS
The BS program in biochemistry provides a strong foundation in both molecular biology and chemistry and is based on faculty, facilities, and research resources in both the Department of Biomolecular Sciences and the Department of Chemistry and Biochemistry. In addition to in-class laboratory instruction, this interdisciplinary program emphasizes independent student research carried out under the guidance of a faculty member from either department. This program is designed to prepare students for careers or advanced study in biochemistry, molecular biology, or health-related fields. For more information, refer to page 111 in this catalog.

Portfolio Requirement
The portfolio requirement in biomolecular sciences will be formally introduced to students during the BMS 190 and 290 introductory core component of all major programs in biomolecular sciences. Minimally, the student portfolio must include a current resume, a current student graduation evaluation or transcript, a planned program of academic study (program sheets available from the Department of Biomolecular Sciences), a narrative describing the student’s goals for undergraduate education and graduate educational or career plans, abstracts of all independent study projects completed, and writing samples from one or more upper-level courses in the major. To fulfill the portfolio requirement in biomolecular sciences, the student portfolio must be reviewed with one or more faculty members in biomolecular sciences:
• as a course requirement in BMS 190 and 290;
• as a required component of all BMS 390, 391, or 491 independent studies or internships; and
• prior to application for graduation, as evidenced by submission of a Portfolio Requirement Completed form (available from the Department of Biomolecular Sciences and signed by the major advisor) to the biomolecular sciences Chair.

MINOR IN BIOMOLECULAR SCIENCES (non-teaching)
20 credits, including BMS 102, 103, 190, 201, and 290; and 11 additional credits of BMS courses, as approved by the biomolecular sciences advisor. BIO 121 may be substituted for BMS 102/103.

MINOR IN GERONTOLOGY
The minor in gerontology provides students with a solid background in different issues related to adult development and aging in order to prepare them to serve the aging population in various capacities. The minor incorporates courses from the schools of Arts and Sciences, Education and Professional Studies, and Technology. For more information, refer to page 112 of this catalog.

Computer Electronics and Graphics Technology

Faculty
K. C. Tracey, Chair; F. Farahmand, M. C. Haase, O. Odesina, V. Rajaravivarma, S. E. Rich, D. Zanella
(Dept. phone 860-832-1830; Fax 860-832-1806; website: www.technology.ccsu.edu)

Department Overview
The Department of Computer Electronics and Graphics Technology offers the following undergraduate BS degree and graduate MS degree programs:
• BS Computer engineering technology
• BS Electronics technology
• BS Industrial Technology with specializations in — networking technology — graphics technology
• MS Computer information technology

Specialization Requirements (30 credits)
CET 113 Introduction to Information Processing 3
CET 223 Basic Electrical Circuits 3
CET 233 Advanced Electrical Circuits 3
CET 323 Electronic Circuits 3
CET 363 Digital Circuits 3
CET 443 Electronic Communication 3
CET 453 Microcomputers 3
EMEC 114 Introduction to Energy Processing 3

The mission of the Department of Computer Electronics and Graphics Technology is to provide educational opportunities in computer engineering, electronics, graphics, networking, and interrelated technological and managerial disciplines. We prepare students to meet dynamic technological challenges as leaders and members of technical design, engineering, and management teams. The programs respond to an increasing industry demand for highly qualified personnel who have a combination of technical and managerial skills. Therefore, this study includes a comprehensive knowledge of industrial processes and applied technologies, in addition to a background in general education. Providing a broad range of educational and career enhancement opportunities, the department prepares graduates for careers in rapidly changing technical fields.

Plans of Study
Students interested in technology programs may attend Central Connecticut State University full- or part-time. Part-time study permits a student to keep a full-time day job and enroll in courses in the late afternoon or evening. Full-time students may complete the programs in four years.

Programs

MAJOR IN ELECTRONICS TECHNOLOGY, BS (122 credits)
Advisor: D. Zanella (860-832-1841)
Accredited by NAIT

This degree prepares students to work as a member of an engineering team in applied design, product development, manufacturing, maintenance, or technical support/sales services in the electrical and electronic industries which include telecommunications, control systems, manufacturing of electromechanical devices and computer services.
SCHOOL OF TECHNOLOGY

EMEC 303 Electromechanical Converters 3
MFG 121 Technical Drafting & CAD 3

Directed Electives (9 credits)
Chosen with an advisor

Core Courses (24 credits)
IT 190 Introduction to Quality Assurance 3
IT 310 Industrial Safety 3
IT 362 Leadership Skills for Supervisors 3
IT 401 Industrial Internship 3
MGT 295 Fundamentals of Management and Organizational Behavior 3
ENG 403 Technical Writing 3
AC 210 Principles of Industrial Accounting 3
MKT 295 Fundamentals of Marketing 3

General Education Requirements
A total of 44–46 credits in General Education studies must be completed as part of all baccalaureate degree programs. Electronics technology majors are required to complete the following 3-credit courses as part of their General Education: Skill Area I—ENG 110, COMM 140; Skill Area II—STAT 104, MATH 115; Study Area II—ECON 201; Study Area IV—CHEM 111 with lab, PHYS 111 with lab.

Note: A minor is not required for this major.

MAJOR IN COMPUTER ENGINEERING TECHNOLOGY, BS
(124 credits)

The BS in computer engineering technology (CET) was granted licensure in November 2004. The CET degree responds to the fact that computers and networks have been two of the leading technologies driving engineering job markets. As with many of the programs in the School of Technology, students explore hardware and software in a hands-on dedicated networking laboratory. Students will use computational methods, computers, and modern technical tools in engineering practice, in addition to learning about state-of-the-art technology in the areas of wired and wireless network communication, engineering design, advanced PC operating systems, internet technology, and computer programming.

As students gain knowledge of hardware and engineering processes and prepare to take industry-based certification exams, they can look forward to well-paying careers. Some will become systems administrators, network administrators, system designers, quality control engineers, and software developers. Others may find positions as information technologists, lab technicians, system maintenance experts, system testers, and help desk operators.

Specialization Requirements (42 credits)
CET 113 Introduction to Networking Technology 3
CET 201 Photonics Principles 3
CET 229 Computer Hardware Architecture 3
CET 236 Circuit Analysis 3
CET 249 Introduction to Electronic Circuits 3
CET 323 Design of Microprocessors 3
CET 323 Senior Project 3

Core Requirements (27 credits)
ENGR 150 Introduction to Engineering 3
ET 251 Applied Mechanics I—Statics 3
ETM 260 CAD and Integrated Manufacturing 3
or
MFG 121 Technical Drafting & CAD 3
ETM 356 Materials Analysis 3
ET 357 Strength of Materials 3
STAT 104 Elementary Statistics 3
ENG 403 Technical Writing 3
or
CS 151 Applications of Computing I 3
CS 152 Applications of Computing II 3
or
CS 213 Applications of Computing II 3

Directed Electives (9 credits)
Suggested directed electives. Other courses may be selected in consultation with an advisor.
CET 301 Fiber-Optics Communications 3
CET 459 Network Security Technologies 3
CET 479 Internet Technologies 3
CS 153 Computer Science III 3
(MATH 152/221 required)

General Education Requirements
Required courses include PHYS 121 or 125, and PHYS 122 or 126 in Study Area IV; ENG 110 and COMM 140 in Skill Area I; MATH 135 or MATH 152 in Skill Area II; MATH 136 or MATH 221 in Skill Area II; PE 144 in Skill Area IV.

MAJOR IN INDUSTRIAL TECHNOLOGY, BS (122 credits)

Accredited by NAIT

Technology majors, regardless of the program selected, are required to complete a common core of 24 credits in technical and management courses as part of their program. The core courses and General Education requirements for this degree are the same as those listed in the electronics technology major on this page. For all industrial technology specializations, there is a graduation requirement of a capstone assessment during a student's final semester of study.

Specialization in Graphics Technology
Advisors: S. E. Rich (860-832-1832), M. Haase (860-832-1837), O. Odesina (860-832-1833)

This specialization is designed to provide the student with knowledge of the various techniques used in the printing industry: composition, photo mechanicals, press work, and bindery. The training will be broad in scope, with an emphasis on wide background rather than mechanical skills, and will equip students to work in management as supervisors, estimators, salespersons, or production controllers.

Specialization requirements (30 credits)
CS 110 Introduction to Internet Programming and Applications 3
ART 120 Design I 3
CET 113 Introduction to Information Processing 3
GRT 112 Digital Imaging for Graphics Technology 3
GRT 212 Graphic Arts Processes 3
GRT 242 Introduction to Graphic Design and Color 3
GRT 342 Screen Printing and Post-Press Operation 3
GRT 362 Estimating and Scheduling for Graphics Technology 3
GRT 442 Print Production 3
GRT 462 Advanced Graphic Arts Techniques 3

Directed Electives 9

**Specialization in Networking Technology**
Advisors: V. Rajaravivarma (860-832-0075), K. Tracey (860-832-1842)

The networking technology specialization prepares individuals to enter into the evolving world of information technology, dealing with computer hardware and software, as well as the peripheral devices closely associated with computer-based systems. The curriculum focuses on local and wide area network design, administration, and internet technologies. Analytically based mathematics, computer science, electronics, and business courses round out the program.

Specialization requirements (27 credits)

**CET**

- CET 113 Introduction to Information Processing 3
- CET 223 Basic Electrical Circuits 3
- CET 229 Computer Hardware Architecture 3
- CET 249 Introduction to Networking Technology 3
- CET 339 Computer System Administration 3
- CET 349 Networking Devices 3
- CET 363 Digital Circuits 3
- CET 449 Advanced Networking 3
- CET 479 Internet Technologies 3

**GRT**

- GRT 212 Graphic Arts Processes 3
- GRT 362 Estimating and Scheduling for Graphics Technology 3
- GRT 442 Print Production 3
- GRT 462 Advanced Graphic Arts Techniques 3

Directed electives 12

Selected in consultation with advisor

Note: A minor is not required for this major.

**MINOR IN NETWORKING TECHNOLOGY**

18 credits as follows:

- CET 223 Basic Electrical Circuits 3
- CET 229 Computer Hardware Architecture 3

**Engineering**

**Faculty**
A. Gates, P.E., Chair (860-832-1823); N. Al-Masoud, G. D. Alungbe, P.E.; C. E. Anderson; S. Basim; P. F. Baumann; L. Lema, CMfgE; E.J. Maydock; O.A. Powell, P.E.; Z. Prusak (Dept. phone 860-832-1815; Fax 860-832-1811; Website: wwwтехнологы.ccsu.edu)

**Department Overview**
The Department of Engineering offers the BS with majors in engineering and engineering technology.

The department offers three engineering technology majors designed to prepare students to become active partners with engineers and to be team members of the total technological enterprise that extends from planning and production to construction and/or service.

Students who have chosen a specific major in engineering technology will be able to apply scientific, mathematical, and basic engineering knowledge and methods, combined with technical skills, in support of engineering activities. The four-year planned course of study includes science, mathematics, computer graphics, communications, and mechanics, along with laboratory courses in the technical specialization.

The civil, manufacturing and mechanical engineering technology programs are accredited by the Technology Accreditation Commission of Accreditation Board for Engineering and Technology, Inc. (TAC of ABET), 111 Market Place, Suite 1050, Baltimore, Maryland 21202. Phone: (410) 347-7700.

Students of senior standing within an accredited program are eligible to take the Fundamentals of Engineering (FE) examination as the first step towards obtaining their Professional Engineer (PE) licensure. Application materials may be requested from the Department of Consumer Protection, 165 Capitol Avenue, Hartford, CT 06106-1630; phone: 860-713-6145. Additional information about the examination may be obtained from the National Council of Examiners for Engineering and Surveying (NCEES) website at www.ncees.org.

The department offers a mechanical engineering major aimed at preparing engineering designers with critical thinking and analytical skills. In addition to the general degree, specializations in manufacturing and aerospace are offered.

**Plans of Study**
Those students enrolled in the Department of Engineering may attend the University as full- or part-time students. Courses offered in the late afternoons or evenings allow part-time students to maintain full-time employment. Full-time students may complete their program in four years. The engineering technology major does not require a minor.

Engineering majors receive a math minor. A co-op experience is suggested for all students.

**Programs**

**MAJOR IN ENGINEERING TECHNOLOGY, BS**

**General Education Requirements**
Engineering technology majors are required to complete 40 to 49 credits of the following courses as part of their General Education requirements.

**Credits**

| Study Area I: Arts & Humanities | 9 |
| Study Area II: Social Sciences | 6 |
| Study Area III: Behavioral Sciences | 3 |
| Study Area IV: Natural Sciences | 8 |
| Skill Area I: Communication Skills | 6 |
| Skill Area II: Mathematics | 6 or 8 |
| Skill Area III: Foreign Language Proficiency | 0–6 |
| Skill Area IV: University Requirement | 2–3 |

* Placement exam may be required before enrolling in English or mathematics courses.

**Recommended**
A minimum grade of C- is required in all courses in the major, all additional course requirements and courses in Study Area IV, Skill Area I, and Skill Area II.

Students are required to obtain an account and computer certification from the campus Microcomputer Lab Office in their first semester of registration.

**Engineering Technology Majors**

The department currently offers the following three majors: civil, manufacturing, and mechanical. Each engineering technology student should choose one of the majors based on individual interests and goals. Course requirements for each major are presented below.

**MAJOR IN CIVIL ENGINEERING TECHNOLOGY, BS**

Accredited by TAC of ABET

*Advisor: S.C. Basim, P.E. (860-832-1807)*

This major provides students with a background in design support, construction, and maintenance of the infrastructure. Graduates may work in consulting firms, construction organizations, testing laboratories, municipal governments, and utility companies. Emphasis is on the areas of surveying, materials, structures, and use of the computer in the civil and construction industries.

**Major Requirements**

60 credits as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 150</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ET 251</td>
<td>Applied Mechanics I—Statics</td>
<td>3</td>
</tr>
<tr>
<td>ET 252</td>
<td>Applied Mechanics II—Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ET 354</td>
<td>Applied Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ET 357</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ET 361</td>
<td>Engineering Technology Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>ET 399</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>ETC 122</td>
<td>Introduction to CAD for AEC I</td>
<td>3</td>
</tr>
<tr>
<td>ETC 353</td>
<td>Introduction to Surveying</td>
<td>3</td>
</tr>
<tr>
<td>ETC 397</td>
<td>Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ETC 451</td>
<td>Soil Mechanics and Foundations</td>
<td>3</td>
</tr>
<tr>
<td>ETC 454</td>
<td>Introduction to Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ETC 457</td>
<td>Advanced Surveying</td>
<td>3</td>
</tr>
<tr>
<td>ETC 458</td>
<td>GPS Mapping for GIS</td>
<td>3</td>
</tr>
<tr>
<td>ETC 470</td>
<td>Structural Steel Design</td>
<td>3</td>
</tr>
<tr>
<td>ETC 471</td>
<td>Reinforced Concrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>ETC 475</td>
<td>Hydrology and Storm Drainage</td>
<td>3</td>
</tr>
<tr>
<td>ETC 498</td>
<td>Engineering Technology Senior Project (Capstone)</td>
<td>3</td>
</tr>
<tr>
<td>ET 251</td>
<td>Applied Mechanics I—Statics</td>
<td>3</td>
</tr>
<tr>
<td>ET 252</td>
<td>Applied Mechanics II—Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ET 357</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ET 361</td>
<td>Engineering Technology Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>ET 399</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>ETM 260</td>
<td>Computer Aided Design and Integrated</td>
<td>3</td>
</tr>
<tr>
<td>ETM 340</td>
<td>Geometric Dimensioning and Tolerancing</td>
<td>3</td>
</tr>
<tr>
<td>ETM 356</td>
<td>Material Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ETM 360</td>
<td>Manufacturing Planning (CAP)</td>
<td>3</td>
</tr>
<tr>
<td>ETM 461</td>
<td>Composites and Plastics Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>ETM 462</td>
<td>Manufacturing Processes Planning and Estimating</td>
<td>3</td>
</tr>
<tr>
<td>ETM 466</td>
<td>Design for Manufacture</td>
<td>3</td>
</tr>
<tr>
<td>ETM 467</td>
<td>Senior Project (Capstone)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Directed Electives (3–9 credits)**

The following courses, selected in consultation with an academic advisor, satisfy the directed technical electives requirement: ETC 472, ETC 476; ET 495; CM 155; CM 455; GEOG 378; CET 113; ENGR 490.

**Additional Requirements (30 credits)**

CET 236 Circuit Analysis 3
CHEM 161 General Chemistry I 3
CHEM 162 General Chemistry I Laboratory 1
CM 356 Materials of Construction 4
ET 240 Spreadsheet and Engineering Problem Solving Tools 3
ET 240 Engineering Problem Solving Tools 4
ETM 358 Applied Thermodynamics 3
MATH 119 Pre-Calculus with Trigonometry 4
MATH 121 Pre-Calculus Mathematics 3
STAT 104 Elementary Statistics 3
ENG 403 Technical Writing 3

**MAJOR IN MANUFACTURING ENGINEERING TECHNOLOGY, BS**

Accredited by TAC of ABET

*Advisors: L. Lema, CMfgE (860-832-1821), E. Maydock (860-832-1818), and Z. Prusak (860-832-1826)*

This major develops concepts employed by manufacturing industries to increase productivity, reduce cost, and efficiently use tools and machinery. Emphasis is on the areas of manufacturing, process planning, CAD/CAM, production techniques, and the application of mathematics and computers.

**Major Requirements**

46 credits as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 150</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 119</td>
<td>Pre-Calculus with Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Pre-Calculus Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 104</td>
<td>Elementary Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENG 403</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Electives (Unrestricted)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Directed Electives (3–4 credits)**

The following courses, selected in consultation with an academic advisor, satisfy the directed technical electives requirement: ET 300; ET 357; ET 459; ETM 358; ETM 367; ENGR 454; ETM 459; ETM 460; ETM 463; ENGR 490.

**Additional Requirements (44 credits)**

CET 236 Circuit Analysis 3
CHEM 161 General Chemistry I 3
CHEM 162 General Chemistry I Laboratory 1
ENG 403 Introduction to Engineering 3
ENGR 490. 3
EMEC 324 Fluid Power Systems 3
ET 240 Spreadsheet and Engineering Problem Solving Tools 3
ETM 466 Design for Manufacture 3
ETM 467 Senior Project (Capstone) 3

**MAJOR IN MANUFACTURING ENGINEERING TECHNOLOGY, BS**

Accredited by TAC of ABET

*Advisors: L. Lema, CMfgE (860-832-1821), E. Maydock (860-832-1818), and Z. Prusak (860-832-1826)*

This major develops concepts employed by manufacturing industries to increase productivity, reduce cost, and efficiently use tools and machinery. Emphasis is on the areas of manufacturing, process planning, CAD/CAM, production techniques, and the application of mathematics and computers.

**Major Requirements**

46 credits as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 150</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 119</td>
<td>Pre-Calculus with Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Pre-Calculus Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 104</td>
<td>Elementary Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENG 403</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Electives (Unrestricted)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
MAJOR IN MECHANICAL ENGINEERING TECHNOLOGY, BS

Accredited by TAC of ABET


This major integrates the aspects of energy conversion, mechanism control, heat and mass transfer, machine dynamics, and design with computer design and analysis to prepare engineering support personnel to assist in the design of machinery and instrumentation for industrial, transportation, and utility applications. The mechanical engineering technologist makes significant contributions in supporting engineering design, testing, production, research, and development operations in a wide variety of industrial, aerospace, and government organizations.

Major Requirements

58 credits as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 150</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ET 251</td>
<td>Applied Mechanics I—Statics</td>
<td>3</td>
</tr>
<tr>
<td>ET 252</td>
<td>Applied Mechanics II—Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ET 354</td>
<td>Applied Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ET 357</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ET 361</td>
<td>Engineering Technology Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>ET 399</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>ETM 260</td>
<td>Computer Aided Design and Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>ETM 340</td>
<td>Geometric Dimensioning and Tolerancing</td>
<td>3</td>
</tr>
<tr>
<td>ETM 356</td>
<td>Material Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ETM 358</td>
<td>Applied Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ETM 367</td>
<td>Machine Design</td>
<td>3</td>
</tr>
<tr>
<td>ETM 462</td>
<td>Manufacturing Process Planning and Estimating</td>
<td>3</td>
</tr>
<tr>
<td>ETM 464</td>
<td>CAD Solid Modeling and Design</td>
<td>3</td>
</tr>
<tr>
<td>ETM 466</td>
<td>Design for Manufacture</td>
<td>3</td>
</tr>
<tr>
<td>ETM 467</td>
<td>CAE Applied Finite Element Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ETM 498</td>
<td>Engineering Technology Senior Project (Capstone)</td>
<td>3</td>
</tr>
</tbody>
</table>

Directed Electives (3–7 credits)
The following courses, selected in consultation with an academic advisor, satisfy the directed technical electives requirement: ET 495; ETM 360; ETM 423; ETM 460; ETM 461; ETM 463; ETM 468; MFG 226; EMEC 334; CET 113; ETC 454; ENGR 490.

Additional Requirements (32 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET 236</td>
<td>Circuit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 161</td>
<td>General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 162</td>
<td>General Chemistry I—Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>EMEC 324</td>
<td>Fluid Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>ET 240</td>
<td>Spreadsheet and Engineering Problem Solving Tools</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>CS 213</td>
<td>Applications of Computing I</td>
</tr>
<tr>
<td>MFG 121</td>
<td>Technical Drafting and CAD</td>
<td>3</td>
</tr>
<tr>
<td>MFG 216</td>
<td>Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>MATH 119</td>
<td>Pre-calculus with Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td>MATH 121</td>
<td>Pre-Calculus Mathematics</td>
</tr>
<tr>
<td>STAT 104</td>
<td>Elementary Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENG 403</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Electives (Unrestricted)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

MAJOR IN MECHANICAL ENGINEERING, BS

The BS in mechanical engineering is a program of study requiring 127–135 credits of undergraduate work, including a two-term senior project capstone requirement completed through oral and written reports. If desired, the candidate may also choose an appropriate sequence of elective courses for specialization in manufacturing or aerospace.

Required coursework can be grouped into four categories: General Education, major requirements, electives or specialization requirements, and additional requirements.

General Education (42–49 credits):

Note: Distribution requirements are similar to the existing engineering technology General Education requirements.

- Study Area I (9 credits)
  - 3 credits of literature; 3 credits of philosophy or fine arts; and 3 credits of literature, philosophy, or fine arts

- Study Area II (6 credits)
  - 3 credits of history and 3 credits of electives

- Study Area III (3 credits)
  - 3 credits of electives

Additional Requirements (38 credits):

- CET 236; CHEM 161, 162, 163, 164; CS 151; ENG 403; ETM 260, 356, 467; MATH 222, 226, 355; and proof of 400 hours professional experience.

Electives or Specialization Requirements (12 credits):

- Electives—3 mechanical engineering electives, 1 technical elective

Manufacturing and Construction Management

Faculty

J. P. Kovel, P.E., Chair; S. R. Bennett; D. C. Dowty; M. Emiliani; R. J. Petreault; P. J. Resetarits, E. Sarisley, P.E.; R. Thamma

(Dept. phone 860-832-1830; Fax 860-832-1806; e-mail: Kovelj@ccsu.edu; website: www.technology.ccsu.edu)

Department Overview

The Department of Manufacturing and Construction Management offers the following undergraduate BS degree and graduate MS degree programs:

- BS Construction Management
- BS Industrial Technology with specializations in
  - manufacturing
  - environmental and occupational safety
  - electro-mechanical technology
  - technology management
• MS Technology Management
• MS Construction Management

The Department of Manufacturing and Construction Management offers programs designed to prepare students for technology-oriented supervisory, middle management, and leadership positions. The programs respond to an increasing industry demand for highly qualified personnel who have a combination of technical and managerial skills. Therefore, this study includes a comprehensive knowledge of manufacturing and construction processes and applied technologies, in addition to a background in general education. Providing a broad range of educational and career enhancement opportunities, the department prepares graduates for careers in rapidly changing technical fields.

Plans of Study
Students interested in the technology programs may attend Central Connecticut State University full- or part-time. Part-time study permits a student to keep a full-time day job and enroll in courses in the late afternoon or evening. Full-time students may complete the 122-credit program in four years.

Programs
MAJOR IN CONSTRUCTION MANAGEMENT, BS (79 credits)
Accredited by ACCE


This sequence of courses is designed to supply the student with knowledge and experiences which will enable him/her to operate effectively in a supervisory position in the construction industries. The emphasis is not on specialized skills, but rather on a broad spectrum of subjects pertinent to the field of construction management. This is a 130-credit program.

Major Requirements Credits
CM 135 Construction Quantity Take-Off 4
CM 155 Construction Documents 3
CM 235 Building Construction Systems 3
CM 245 Heavy/Highway Construction Systems 3
CM 255 Construction Business Principles 3
CM 275 Introduction to MEP Systems 3
CM 325 Building Construction Estimating 4
CM 335 Construction Safety 3
CM 345 Heavy/Highway Construction Estimating 4
CM 353 Introduction to Surveying 4
CM 355 Construction Planning 4
CM 356 Materials of Construction 4
CM 435 Construction Superintendency 3
CM 455 Construction Project Management 4
CM 465 Construction Internship 3
ET 241 Applied Statics and Strength of Materials 3
ETC 405 Applied Structural Systems 3
Free Electives (0–5)
Other Required Electives (21 credits):
AC 211 Introduction to Financial Accounting 3
MGT 295 Fundamentals of Management and Organizational Behavior 3
ENG 403 Technical Writing 3
LAW 250 Legal Environment of Business 3
MKT 295 Fundamentals of Marketing 3
MATH 125 Applied Calculus 3
CET 113 Introduction to Information Processing 3

Requirements in General Education (46–53 credits):
Study Area I
9 credits, including literature elective (3) and PHIL 240;
Study Area II
9 credits: history elective (3) and ECON 200 and 201;
Study Area III
6 credits, including PSY 112;
Study Area IV
8 credits: CHEM 161/162 and PHYS 121;
Skill Area I
6 credits: ENG 110 and COMM 140;
Skill Area II
6 credits: STAT 200 and MATH 115;
Skill Area III
0–6 credits;
Skill Area IV
2–3 credits, including PE 144

Additional Requirements
Students must complete an exit interview during April–May of the year of graduation.

Note: A total of 130 credits are required for the degree.

MAJOR IN INDUSTRIAL TECHNOLOGY, BS (63 credits)
Accredited by NAIT

Major Requirements
Industrial technology majors, regardless of the program selected, are required to complete a common core of 24 credits in technical and management courses as part of their program. Courses included within these common requirements are as follows:

Industrial Technology Core Courses: Credits
IT 190 Introduction to Quality Assurance 3
IT 310 Industrial Safety 3
IT 362 Leadership Skills for Supervisors 3
IT 401 Industrial Internship 3
MGT 295 Fundamentals of Management and Organizational Behavior 3
ENG 403 Technical Writing 3
AC 210 Principles of Industrial Accounting 3
MKT 295 Fundamentals of Marketing 3

*Requirements are different for construction management specializations.

General Education Requirements:
A total of 44–46 credits in General Education studies must be completed as part of all baccalaureate degree programs.

Industrial technology majors are required to complete the following 3-credit courses as part of their General Education:
Skill Area I — ENG 110, COMM 140;
Skill Area II — STAT 104, MATH 115; Study Area II — ECON 201; Study Area IV — CHEM 111 with lab, PHYS 111 with lab.

INDUSTRIAL TECHNOLOGY SPECIALIZATION PROGRAMS
Each student should identify a program based on individual interests and goals. Six undergraduate programs are available; each is shown with its course requirements.
### Specialization in Manufacturing
**Advisors:** M.L. Emiliani (860-832-3229)

This specialization is designed to prepare students primarily for middle management and supervisory positions that are production oriented. Areas of study include production control, computer-based manufacturing technology, lean manufacturing, supply chain strategy, cost estimating, production supervision, and quality control. (Related job titles include industrial engineer, production supervisor, and quality control supervisor.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG 118</td>
<td>Introduction to Materials</td>
<td>3</td>
</tr>
<tr>
<td>MFG 121</td>
<td>Technical Drafting &amp; CAD</td>
<td>3</td>
</tr>
<tr>
<td>MFG 216</td>
<td>Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>MFG 226</td>
<td>Principles of CNC</td>
<td>3</td>
</tr>
<tr>
<td>MFG 236</td>
<td>Tool Design</td>
<td>3</td>
</tr>
<tr>
<td>MFG 496</td>
<td>Lean Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>CET 113</td>
<td>Intro. to Information Processing</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 114</td>
<td>Intro. to Energy Processing</td>
<td>3</td>
</tr>
<tr>
<td>ETM 340</td>
<td>Geometric Dimensioning &amp; Tolerancing</td>
<td>3</td>
</tr>
<tr>
<td>IT 360</td>
<td>Production Systems</td>
<td>3</td>
</tr>
<tr>
<td>IT 464</td>
<td>Six Sigma Quality</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical &amp; Management Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

### Specialization in Environmental and Occupational Safety
**Advisor:** P. J. Resetarits (860-832-1834)

The Occupational Safety and Health Act of 1970, by requiring employers to provide safe and healthful working conditions, has increased the need for trained safety personnel. This specialization in environmental and occupational safety will prepare students for management positions as safety professionals in private industry and federal, state, and local government.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET 113</td>
<td>Intro. to Information Processing</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 114</td>
<td>Intro. to Energy Processing</td>
<td>3</td>
</tr>
<tr>
<td>MFG 118</td>
<td>Intro. to Materials</td>
<td>3</td>
</tr>
<tr>
<td>MFG 121</td>
<td>Technical Drafting and CAD</td>
<td>3</td>
</tr>
<tr>
<td>CET 223</td>
<td>Basic Electrical Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 303</td>
<td>Electro-Mechanical Converters</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 323</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 324</td>
<td>Fluid Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 333</td>
<td>Data Acquisition and Control</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 334</td>
<td>Mechanisms for Automation</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 463</td>
<td>Programmable Logic Controllers</td>
<td>3</td>
</tr>
<tr>
<td>IT 480</td>
<td>Robotics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Technical and Management Electives</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

### Specialization in Electro-Mechanical Technology
**Advisor:** D. Dowty (860-832-1816); R. Thamma (860-832-3516)

The mission of this program is to educate students in technical management as it applies to electro-mechanical technology. Students develop their technical skills in the laboratory. Course work is provided in the areas of hydraulics, pneumatics, mechanical motion control, programmable logic controllers, servo and no-servo robotics, engines, electrical motors and generators, and industrial electricity. Emphasis is placed on data acquisition and feedback mechanisms and the use of various control devices, including personal computers, programmable logic controllers, and sequence controllers. Culminating experiences in management provide graduates with the skills to become supervisors, project managers, production automation technicians, and technical salespeople in the field.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMEC 114</td>
<td>Intro. to Energy Processing</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 118</td>
<td>Intro. to Materials</td>
<td>3</td>
</tr>
<tr>
<td>MFG 118</td>
<td>Technical Drafting and CAD</td>
<td>3</td>
</tr>
<tr>
<td>CET 223</td>
<td>Basic Electrical Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 303</td>
<td>Electro-Mechanical Converters</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 323</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 324</td>
<td>Fluid Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 333</td>
<td>Data Acquisition and Control</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 334</td>
<td>Mechanisms for Automation</td>
<td>3</td>
</tr>
<tr>
<td>EMEC 463</td>
<td>Programmable Logic Controllers</td>
<td>3</td>
</tr>
<tr>
<td>IT 480</td>
<td>Robotics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Technical and Management Electives</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

### Specialization in Technology Management
**Advisors:** M.L. Emiliani (860-832-3229), P. J. Resetarits (860-832-1834)

This specialization has been developed to allow students to develop a custom plan of study utilizing various existing technical and management courses. Students transferring credits in from other institutions of higher education can use those credits in this specialization. The technology management specialization requires the student to complete the 24 credits in the industrial technology core courses plus 39 credits of technical and management electives.

### Technology and Engineering Education (K–12)

**Faculty**

J. A. DeLaura, Chair (860-832-1850), M. Dischino, P. Foster, D. Sianez, M. C. Vincenti (Dept. phone 860-832-1850; Fax 860-832-1811; Website: www.technology.ccsu.edu)

**Department Overview**

The Department of Technology and Engineering Education (K–12) offers the following programs of instruction:

- BS degree in technology and engineering education (K–12);
- Post baccalaureate certification program in technology education;
- MS degree programs in technology education; and
- Planned post master’s—no certificate or degree.

Specific requirements for the planned fifth year, MS degree program and post master's
programs in technology education are stated in the graduate catalog.

The technology and engineering education (K–12) curriculum prepares individuals for teacher certification, grades K–12. Emphasis is placed on designing, developing, and utilizing technological systems; open-ended problem-based design activities; cognitive, manipulative, and affective learning strategies; and applying technological knowledge and processes to real-world experiences utilizing up-to-date resources. Technology and engineering education (K–12) majors complete a core of technology courses involving classroom and laboratory experiences with the materials, machines, systems, and concepts related to technology. In General Education, technology majors experience courses in the humanities, social and behavioral sciences, mathematics, natural sciences, fine arts, and physical education. Preparation as a technology educator culminates with a core of professional education courses involving teaching strategies, evaluation, curriculum development, and student teaching.

Individuals who already have a bachelor’s degree who desire to meet certification requirements for teaching technology and engineering education (K–12) in Connecticut should contact Dr. James DeLaura (860-832-1850).

Program
MAJOR IN TECHNOLOGY AND ENGINEERING EDUCATION (K–12), BS (130 credits)

General Education Requirements
A total of 45–52 credits in General Education studies must be completed as part of all baccalaureate degree programs. See the General Education section in this catalog. Technology and engineering education (K–12) students are required to take ENG 110, COMM 115 or 140, PE 144, HIST 161 or 162, MATH 115 or 119, PSY 236, TE 110, PHYS 111, CHEM 111, and STAT 104. These courses count toward the overall General Education requirements.

Note: This major does not require a minor.

Technology and Engineering Education (K–12) Professional Requirements
Students are required to take TE 299, 399, and 400. All of these courses may not be available each semester and are seldom available during the summer sessions; refer to the course description section of this catalog for information.

Technology and Engineering Education (K–12) Technical Requirements
Technology and engineering education (K–12) majors are required to take MFG 118, MFG 121, ENGR 150, CET 223, ET 241, and TE 115, 155, 215, 221, 245, 310, 330, 417, and 498. Students may take additional technical courses, indicated by the TC prefix, approved by their technology and engineering education (K–12) advisor to fulfill their General Education requirements.

Professional Education Requirements
Technology and engineering education (K–12) majors are required to take SPED 315, EDSC 375, EDF 415, EDTE 316, EDSC 414, EDSC 415, and RDG 440.

Admission to the Professional Program
Students must make formal application for admission to the Professional Program of technology and engineering education (K–12) after completion of 45 credits in course work. At least 15 of these credits must be in TC or TE courses. Applications are available from the dean of the School of Education and Professional Studies, Barnard Hall, and must be filed prior to September 21 or February 21. Acceptance is prerequisite to taking TE 400, EDSC 375, 414, and 415, EDF 415, EDTE 315, and SPED 315. Students must maintain a minimum 2.50 grade point average in all technology courses. See School of Education and Professional Studies, Admission to Professional Program section in the catalog for additional information.

Cooperative Technology Programs
The College of Technology offers students:
• a clear pathway from a two-year college to a four-year university, without loss of credits or repeated coursework;
• the opportunity to begin their education on a full- or part-time basis at any of Connecticut’s 12 community-technical colleges;
• low costs by completing the first two years of study at a community-technical college; and
• direct admission into CCSU’s School of Technology.

This program provides a direct entry to the School of Technology at CCSU without loss of credits or having to repeat course work. A student can complete a minimum of 30 credits or up to 60 credits at any CSU campus with at least a grade C in each course before continuing at Central.

The pathway coordinator has been identified at each CSU campus. For information, contact the associate dean of the School of Technology at CCSU.

BIOMOLECULAR SCIENCES PATHWAY/DEGREE PROGRAM
The Biomolecular Sciences Pathway, for entry into the University's undergraduate BS degree programs in biomolecular sciences and biochemistry, consists of coursework in mathematics and the natural sciences—biology, chemistry, and physics.

General Education Core
Arts/Humanities/Social Science/Behavioral Science/Communication:
English Language
(Freshman Composition) 3
Philosophy or Fine Arts Electives 6
History 3
Psychology, Sociology, or Anthropology 3
Economics, Geography, or Political Science 6
Public Speaking 3
Technical Writing 3
Subtotal (maximum) 27

Science and Math Core:
General Chemistry I 4
General Physics I 4
Statistics 3
Trigonometry or Pre-Calculus 4
Subtotal (minimum) 15

Technology Core:
Microbiology 4
Directed Elective—General Biology I 4
Directed Elective—General Biology II 4
Subtotal (minimum) 12
Specialization Electives:
- Genetics 3
- General Physics II 4
- General Chemistry II 4
- Molecular and Cellular Biology or Anatomy and Physiology I 4

Subtotal 15

Total Credits 69

Note: Major-specific electives appropriate for this pathway may be different for each community-technical college. Consult your College of Technology site coordinator for further information.

ENGINEERING SCIENCE PATHWAY/DEGREE PROGRAM

The Engineering Pathway, for entry into CCSU’s School of Technology and the School of Engineering at the University of Connecticut, University of New Haven, Fairfield University, and University of Hartford, consists primarily of coursework in engineering, mathematics, and the sciences. In addition to the courses shown below, a grade average of B is required for continuation at UCONN’s School of Engineering to earn a bachelor’s degree. Credit is awarded for all courses in which a grade of C or above is earned.

Engineering Science Programs:
- Chemical engineering
- Civil engineering
- Computer science and engineering
- Electrical engineering
- Mechanical engineering
- Material engineering (as a double major with one of the above)
- Acoustic (University of Hartford only)
- Biomedical (University of Hartford only)

Engineering Science Curriculum

Arts/Humanities:
- Composition 3
- Fine Arts Elective 3
- Philosophy and Ethical Analysis 3
- Western Culture 3
- Social Science Elective 3

Subtotal 15

Mathematics/Science:
- Calculus I 3 or 4
- Calculus II 3 or 4
- Multivariable Calculus (Calculus III) 4
- Differential Equations 4
- General Chemistry I and II (with lab) 4/4
- Engineering Physics I and II 4/4

Subtotal (min.) 30

Engineering Science:
- Introduction to Engineering or equivalent 3 or 4
- Applied Mechanics I and II 3/3
- Computer Programming 3

Subtotal (min.) 12

Major Specific Electives 6

Total Credits 63

Note: The engineering science curriculum may require additional coursework beyond the College of Technology. These extra credits can be acquired as part of the College of Technology consortia arrangement. Consult your College of Technology site coordinator for additional information.

TECHNOLOGY STUDIES PATHWAY/DEGREE PROGRAM

The Technology Studies Pathway prepares students for entry into the Department of Engineering in CCSU’s School of Technology. After completion of two years of initial study at a community college and another two years at Central, the student will receive a BS degree with a major in any one of the three programs listed below. The civil, manufacturing, and mechanical engineering technology programs are accredited by TAC of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202; phone: 410-347-7700. A minimum grade of C in the courses listed below will transfer into any of the five engineering technology programs currently offered at Central.

Engineering Technology Programs:
- Civil
- Manufacturing
- Mechanical
- Computer

General Education Core

Arts/Humanities/Social Science/Behavioral Science/Communication:
- English Language (Freshman Composition) 3
- Technical Writing 3
- Public Speaking 3
- Philosophy and Fine Arts 6
- History 3
- Economics, Geography, Political Science or History 6
- Anthropology, Psychology or Sociology 3

Subtotal (maximum) 27

Science/Mathematics Core:
- General Chemistry I with Laboratory 4

Subtotal (maximum) 16

Technology:
- Technical Drafting or CAD 3
- Directed Elective 3
- Directed Elective 3

Subtotal 9

Total credits 65–69

TECHNOLOGY STUDIES PATHWAY/DEGREE PROGRAM

The Technology Studies Pathway, for entry into CCSU’s School of Technology or Charter Oak State College, consists of courses which provide for a BS degree from Charter Oak State College, with a minor in technology, or from CCSU in one or more of the fields listed below. A minimum course grade of C and the credits described below are required for continuing at CCSU’s School of Technology or at Charter Oak.

Technology
- Construction management
- Electronics technology

Industrial Technology Specializations
- Computer networking
- Electro-mechanical technology
- Environmental/occupational safety
- Electronics technology
- Graphics technology
- Manufacturing
- Technology management**

** Two-year associate degree plus two years of CCSU coursework. For more information, see www.technology.ccsu.edu.

General Education Core

Arts/Humanities/Social Science/Behavioral Science/Communication:
- English Language (Freshman Composition) 3
- Public Speaking 3
- Technical Writing 3
- Philosophy and Fine Arts 6
### General Education Core
Arts/Humanities/Social Science/Behavioral Science/Communication:
- English Language (Freshman Composition) 3
- Public Speaking 3
- Philosophy and Fine Arts 6
- U.S. History 3
- Economics, Geography, Political Science or History 6
- Psychology-Life Span Development 3
- Anthropology, Psychology or Sociology 3
- **Subtotal** 27

### Natural Science/Mathematics:
- Intro. to Chemistry or General Chemistry I* 3 or 4
- Intro. to Physics or General Physics I* 3 or 4
- Statistics 3 or 4
- Trigonometry or Pre-Calculus 3 or 4
- **Subtotal** 12–16

### Technology and Engineering Education
Program leading to certification to teach technology education in grades K–12 in the public schools of Connecticut. In addition to careers in public school teaching, technology education graduates may also function as instructors or supervisors in private and post-secondary schools, industry, government, and rehabilitation programs.

### Technology Pathway Program
The CSU-CCSU Technology Pathway Program is an integrated curriculum allowing individuals to begin their studies at any CSU campus (Southern, Eastern, or Western) and advance directly to any program in the School of Technology at Central Connecticut State University. The Pathway Program provides the foundation or the initial two years of a BS degree.

The School of Technology at Central Connecticut State University offers the only programs of study in technology education, industrial technology, engineering, and engineering technology in the Connecticut State University System. Each degree program has a variety of technical specializations designed to provide students with a balance of classroom learning (theory) and activity-based laboratory (practical application) courses. In addition, the School of Technology’s cooperative education program provides opportunities for students to work with major industries in a variety of technical and engineering areas. Graduates of the programs enter the workforce with the knowledge and confidence needed to compete and succeed in today’s industrial and technological marketplace.

### Course Offerings in Vocational-Technical Education
**Office of Continuing Education (860-832-2256)**

The course offerings in vocational-technical education are designed to prepare teachers of occupational subjects (skilled trades) and trade-related subjects for Connecticut’s technical high schools, teachers of trade and industrial occupational subjects for comprehensive high schools, and health occupation educators for their state of Connecticut.