

# DIVISION OF MATHEMATICS, ENGINEERING TECHNOLOGIES AND COMPUTER SCIENCE

This division offers A.S. degree programs designed to prepare students for transfer to 4-year institutions to pursue degrees in science and technology, and A.A.S. and certificate programs designed to prepare students to enter the workforce upon graduation. Programs utilize cutting-edge equipment in laboratories for training next generation engineers, technicians, and scientists. Faculty have diverse backgrounds in applied sciences in both educational and industrial settings; most have earned doctorate or professional engineering licenses in field of specialization.

**Location:** Level II – Blue Area

**Chairperson:** Brooke Orosz (Acting)

**Faculty:** Eman Aboelnaga, Theophilus Acquaye, Emmanuel Adepo, Shohreh Andresky, Hossein

Assadipour, Ron Bannon, Carlos Castillo, Teryn Cha, Carlos De la Torre, Alkis

Dimopoulos, Ines Figueiras, Mingyon McCall, Naser Moheb, Brooke Orosz, Daxay Patel,

Timothy Stafford, Doris Tori, Mamta Vyas, Chengwen Wang, Martin Weissman, Alvin

Williams, and Ned Wilson.

**Administrative Assistant:** Wisline Norde

Applied Computer Science Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/applied-computer-science-as/>)

Division of Mathematics, Engineering  
Technologies, & Computer Sciences –

Curriculum Code: 2303

**Will Earn Upon Completion:** Associate in Science (A.S.) Degree

## ***Why major in Applied Computer Science?***

Program prepares for careers in management or other positions in information technology as well as for transfer. Typical entry-level positions include Technical Support Specialist, Network Technician, Database Application Specialist, PC Technician, and Helpdesk Technician.

## ***If I major in Applied Computer Science can I transfer to an upper-division college or university?***

Curriculum prepares for transfer to upper-division colleges and universities. Consult catalog where you plan to transfer to, to select courses toward your baccalaureate.

## ***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

## ***How long will it take me to complete this degree?***

If you do not need developmental courses and register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking summer courses.

## ***Upon completion of this program, graduates will be able to:***

Design applications in object-oriented language using various dynamic and static data structures;

Design digital circuitry;

Utilize multitasking, preemptive scheduling, time sharing operating system concepts and associated communications, networking, and security issues;

Design and implement relational database with supporting applications;

Demonstrate multi-user database processing in LANs in client-server systems;

Demonstrate object-oriented design techniques using encapsulation, abstraction, inheritance, and reusability; and

Use software applications like spreadsheets, word processing, and basic programming.

## ***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

Architectural Technology Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/architectural-technology-aas/>)

Division of Mathematics, Engineering  
Technologies, & Computer Sciences –

Curriculum Code: 2301

**Will Earn Upon Completion:** Associate in Applied Science (A.A.S.) Degree

## ***Why major in Architectural Technology?***

Program prepares for entry-level positions in the architectural profession ranging from Construction Site Inspector to CAD Operator. Instruction includes work in architectural design studio with opportunities to express ideas via conceptual architectural projects.

## ***If I major in Architectural Technology can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions. Placement in upper-division colleges or universities depends on individual academic performance and portfolio of work accumulated in the course of Architectural Technology study.

**Are there any requirements I must satisfy before I start taking courses in my major?**

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

**How long will it take me to complete this degree?**

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in Summer sessions.

**Upon completion of this program, graduates will be able to:**

- Demonstrate knowledge of basic construction principles and materials;
- Understand architectural and engineering drawings including scale and orthographic projection;
- Design various architectural projects including site layout and building features;
- Design structures utilizing functional as well as aesthetic considerations;
- Demonstrate ability to conduct architectural presentations for graphics and design pin-ups;
- Demonstrate knowledge of architectural history, including it influences design today; and
- Utilize computer software applications including computer aided design (CAD).

**Where should I direct specific questions?**

Contact the Division (973) 877-3302.

**Civil Engineering Technology Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/civil-engineering-technology-aas/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 5309**

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

**Why major in Civil Engineering Technology?**

Program prepares for entry-level positions in construction and civil engineering fields, including opportunities with engineering firms, building contractors, utility and materials testing companies, or engineering departments of governmental agencies.

**If I major in Civil Engineering Technology can I transfer to an upper-division college or university?**

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions; is a dual admissions program with NJIT.

**Are there any requirements I must satisfy before I start taking courses in my major?**

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

**How long will it take me to complete this degree?**

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

**Upon completion of this program, graduates will be able to:**

- Demonstrate knowledge of engineering mechanics, material strength, and structural systems;
- Understand engineering drawings including concept of scale and orthographic projection;
- Make field measurements using surveying instruments like a theodolite, steel tape, and transit;
- Demonstrate knowledge of surveying principles including traverse, level top, topographic survey, construction stakeout, and road centerline design;
- Perform soil tests and demonstrate knowledge of underlying principles of soil mechanics;
- Design simple culvert system or storm sewer system and demonstrate knowledge of underlying principles of hydraulics and hydrology; and
- Utilize computer software applications including computer aided design (CAD).

**Where should I direct specific questions?**

Contact the Division (973) 877-3302.

**Computer Information Systems Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/computer-information-systems-as/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 2002**

**Will Earn Upon Completion: Associate in Science (A.S.) Degree**

**Why major in Computer Information Systems?**

Program prepares for careers in management or other positions in information technology as well as for transfer. Typical entry-level positions include Technical Support Specialist, Network Technician, Database Application Specialist, PC Technician, and Helpdesk Technician.

**If I major in Computer Information Systems can I transfer to an upper-division college or university?**

Curriculum prepares for transfer to upper-division colleges and universities; is a dual admissions program with NJIT. Consult catalog where you plan to transfer to, to select courses toward your baccalaureate.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in Summer sessions.

***Upon completion of this program, graduates will be able to:***

Design applications in object-oriented language using dynamic and static data structures;

Design and implement relational database with supporting applications;

Demonstrate multi-user database processing in LANs in client-server systems;

Apply business organization and management concepts to information technology environments; and

Demonstrate understandings of principles of financial accounting for inventories receivables, assets, liabilities, internal control, and corporate entities.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Computer Science Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/computer-science-as/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 2302**

**Will Earn Upon Completion: Associate in Science (A.S.) Degree**

***Why major in Computer Science?***

Program prepares for direct entry to computer technology jobs as well as for transfer emphasizing mathematically-oriented computer applications. Entry-level positions include Application Programmer, Systems Analyst or Programmer, Software Engineer, Technical Support Specialist, Network Technician, and Helpdesk Technician.

***If I major in Computer Science can I transfer to an upper-division college or university?***

Curriculum prepares for transfer to upper-division institutions, with dual admissions to NJIT. Consult catalog where you may transfer to select courses toward baccalaureate.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in Summer sessions.

***Upon completion of this program, graduates will be able to:***

Design applications in object-oriented language using various dynamic and static data structures;

Design digital circuitry;

Utilize multitasking, preemptive scheduling, time sharing operating system concepts and associated communications, networking, and security issues;

Design and implement relational database with supporting applications;

Demonstrate multi-user database processing in LANs in client-server systems;

Demonstrate object-oriented design techniques using encapsulation, abstraction, inheritance, and reusability; and

Use software applications like spreadsheets, word processing, and basic programming.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Cybersecurity and Network Technology Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/cybersecurity-network-technology-aas/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 2312**

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

***Why major in Cybersecurity and Network Technology?***

Program prepares for entry-level positions in information technology relating to securing devices like computers, smartphones, and computer networks including the Internet. It is designed to meet the changing needs of industry and provide students with technical expertise to administer computer networks and secure scalable connected networks.

***If I major in Cybersecurity and Network Technology can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking summer courses.

***Upon completion of this program, graduates will be able to:***

Describe and analyze hardware, software, network components, and their interrelations;

Explain networking protocols and hierarchical relations of hardware and software;

Compare protocol models and select appropriate protocols for a particular design;

Manage multiple operating systems, systems software, network services, and security, as well as evaluate and compare systems software and emerging technologies;

Develop solutions for networking and security problems, balancing business and technical issues and security;

Explain concepts of confidentiality, availability, and integrity in Information Assurance; and

Effectively communicate technical information verbally, in writing, and in presentation.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Electrical and Computer Engineering Technology**  
(<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/electrical-and-computer-engineering-technology-aas/>)

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 2313**

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

***Why major in Electrical and Computer Engineering Technology?***

Program prepares for entry-level positions working with engineers in the design, fabrication, installation, operation, maintenance, and repair of electrical and computer devices.

***If I major in Electrical and Computer Engineering Technology can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions, particularly New Jersey Institute of Technology.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 16 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Demonstrate knowledge of digital circuits like those used in construction of computers;

Read schematic electronics diagrams for purposes of testing and development; and

Utilize computer software to analyze electrical circuits with the aid of digital computers.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Engineering Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/engineering-as/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 0399**

**Will Earn Upon Completion: Associate in Science (A.S.) Degree**

***Why major in Engineering?***

Program matches the first two years of an engineering baccalaureate preparing for students for seamless transfer. Students select engineering major elective courses from one of the branches of engineering that they plan to specialize in after transferring, such as electrical, biomedical, chemical, civil computer, or mechanical engineering.

***If I major in Engineering can I transfer to an upper-division college or university?***

Curriculum prepares for transfer to upper-division colleges and universities, with a dual admissions program to NJIT. Consult catalog where you plan to transfer to, to select courses toward your baccalaureate.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 16 credits each semester, degree can be completed in two years, which may be shortened by taking courses in Summer sessions.

***Upon completion of this program, graduates will be able to:***

Analyze engineering drawings including concept of scale and orthographic projection;

Assist engineers and technicians in performing tasks relevant to selected branch of engineering;

Complete written engineering reports using skills acquired in curriculum courses;

Write computer programs to solve engineering based problems using skills acquired in curriculum courses;

Demonstrate knowledge of engineering principles such as mechanics, materials, and systems; and

Utilize computer software applications used in engineering including computer aided design (CAD).

**Where should I direct specific questions?**

Contact the Division (973) 877-3302.

**Health Information Technology (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/health-information-technology-aas/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 2124**

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

**Why major in Health Information Technology?**

Program prepares for entry-level training for management systems to collect, store, process, retrieve, analyze, disseminate, and communicate information related to the health care industry.

**If I major in Health Information Technology can I transfer to an upper-division college or university?**

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions, particularly to the Medical Informatics program at New Jersey Institute of Technology and that for Health Information Technology at Rutgers-Newark.

**Are there any requirements I must satisfy before I start taking courses in my major?**

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

**How long will it take me to complete this degree?**

If you do not need developmental courses and you register for an average of 16 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

**Upon completion of this program, graduates will be able to:**

Function as an entry-level Health Information Technician;

Comply with principles, legal and professional standards, government regulations, and accrediting agencies which govern health; and

Communicate effectively with any and all providers and users of health information technology.

**Where should I direct specific questions?**

Contact the Division (973) 877-3302.

**Mathematics Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/mathematics-as/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 0604**

**Will Earn Upon Completion: Associate in Science (A.S.) Degree**

**Why major in Mathematics?**

Program prepares for baccalaureate in mathematics, mathematics education or related fields emphasizing methodological problem-solving like data analysis and actuarial science.

**If I major in Mathematics can I transfer to an upper-division college or university?**

Curriculum prepares for transfer to upper-division colleges and universities, with dual admissions to Rutgers-Newark, Kean University, and New Jersey City University. Consult catalog where you plan to transfer to, to select courses toward your baccalaureate.

**Are there any requirements I must satisfy before I start taking courses in my major?**

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

**How long will it take me to complete this degree?**

If you do not need developmental courses and register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking summer courses.

**Upon completion of this program, graduates will be able to:**

Demonstrate knowledge of fundamental concepts and theories from calculus, differential equations, linear algebra, and discrete mathematics;

Utilize problem-solving and critical-thinking techniques to set up and solve applied problems in engineering, sciences, business, and technology fields;

Communicate accurate mathematical terminology and notation in written and/or oral form to explain strategies to solve problems and interpret found solutions; and

Use appropriate technology, like graphing calculators and software, effectively as tools to solve

problems like those described above.

**Where should I direct specific questions?**

Contact the Division (973) 877-3302.

## Mechanical and Manufacturing Engineering Technology (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/mechanical-and-manufacturing-engineering-technology-aas/>)

Division of Mathematics, Engineering Technologies, & Computer Sciences –

Curriculum Code: 2314

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

### ***Why major in Mechanical and Manufacturing Engineering Technology?***

Program prepares for entry-level positions working in areas such as mechanical design, quality control, material testing, facilities design, automation, stress analysis, and sales.

### ***If I major in Electrical and Computer Engineering Technology can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions, particularly New Jersey Institute of Technology.

### ***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

### ***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 16 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

### ***Upon completion of this program, graduates will be able to:***

Demonstrate knowledge of fundamental principles of engineering mechanics and strength of materials;

Select and specify materials for manufacturing applications based on principles of engineering mechanics, strength of materials, weight, corrosion, finish, and cost;

Apply basic principles of blueprint reading to prepare detailed working drawings using computer aided design (CAD) skills; and

Utilize 3D solid modeling CAD systems to create mechanical components and generate assembly designs.

### ***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

## Software Development Technology Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/software-development-technology-aas/>)

Division of Mathematics, Engineering Technologies, & Computer Sciences –

Curriculum Code: 2316

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

### ***Why major in Software Development Technology?***

Program introduces students to fundamental concepts of programming with emphasis on the whole software development process.

### ***If I major in Software Development Technology can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions.

### ***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

### ***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

### ***Upon completion of this program, graduates will be able to:***

Design, develop, and implement a major software-based project;

Test software systems with specification, performance, maintenance, and quality requirements;

Apply software engineering theory, principles, tools, and processes, as well as theory and principles of computer science and mathematics, to the development and maintenance of complex software development systems;

Evaluate impact of potential solutions to software engineering problems in a global society, using knowledge of contemporary issues and emerging software engineering trends, models, tools, and techniques;

Create interactive Web applications; and

Design and develop mobile applications for the Android platform.

### ***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

## Technical Studies Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/technical-studies-as/>)

Division of Mathematics, Engineering Technologies, & Computer Sciences –

Curriculum Code: 5304

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

### ***Why major in Technical Studies?***

The Technical Studies degree program is designed to ensure validity of nontraditional learning and promote adult access to and success in postsecondary education and the workforce. By majoring in Technical Studies, you can transfer in approved credits from construction code training programs and earn a college degree.

***If I major in Technical Studies can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this degree?***

If you do not need developmental courses and you register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Demonstrate necessary technical skills to be more productive in chosen profession and career;

Demonstrate competence in broad array on intellectual and communication skills;

Compete effectively in a technology-based global economy;

Develop a broad base of knowledge;

Think creatively, analytically, and critically;

Apply basic principles of blueprint reading to prepare detailed working drawings using computer aided design (CAD) skills; and

Communicate effectively.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Technical Studies: Uniform Construction Code  
Technology Program (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/technical-studies-uniform-construction-code-technology-as/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 5305**

**Will Earn Upon Completion: Associate in Applied Science (A.A.S.) Degree**

***Why major in Technical Studies: Uniform Construction Code Technology?***

The Technical Studies: Uniform Construction Code Technology Option degree program is designed to ensure validity of nontraditional

learning and promote adult access to and success in postsecondary education and the workforce. By majoring in Technical Studies: Uniform Construction Code Technology Option, you can transfer in approved credits from construction code training programs and earn a college degree.

***If I major in Technical Studies can I transfer to an upper-division college or university?***

Program is career oriented, not specifically designed for transfer. However, most colleges and universities in New Jersey accept training credits recommended by the American Council on Education (ACE), which evaluates training programs. Therefore, you can transfer some or all of credits earned in the Technical Studies: Uniform Construction Code Technology Option degree program to a professional studies bachelor's degree program at a four-year institution.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major. You may also have your training credits evaluated by a faculty member of the Division.

***How long will it take me to complete this degree?***

If you do not need developmental courses and register for an average of 15 credits each semester, degree can be completed in two years, which may be shortened by taking summer courses.

***Upon completion of this program, graduates will be able to:***

Review construction plans in terms of compliance with applicable state and local codes;

Determine whether construction is in conformance with approved plans;

Apply technical and administrative code-related knowledge in code enforcement; and

Demonstrate appropriate oral and written communication skills and professional behaviors, which include being able to write technical reports, communicate well with others during site visits/inspections, and effectively work as a member of a team.

***Where should I direct specific questions?***

Call the Division at (973) 877-3302 or the West Essex Campus Director of Academic Programs at (973) 877-1912.

**Building Code Technology Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/building-code-technology-certificate-achievement/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 3052**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Building Code Technology?***

Certificate offers opportunity to fulfill credentials for state-approved licensing requirements adopted by the New Jersey Uniform Construction

Code, administered by the Department of Community Affairs. Provides currently licensed code enforcement personnel means to upgrade educational credentials and prepares for inspector-related employment.

***If I major in Building Code Technology can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 6 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Evaluate construction plans in terms of compliance with state and local building codes;

Determine if construction conforms to approved plans;

Apply technical and administrative code-related knowledge in code enforcement;

Effectively use English language skills gained in program to comprehend and evaluate ideas in context of code enforcement, and communicate them both orally and in writing; and

Take National Certification Examination to become a licensed Building Code Inspector.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Computer and Network Support Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/computer-network-support-academic-certificate/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3321**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Computer and Network Support?***

Certificate introduces students to installation, configuration, troubleshooting, and maintenance of computer hardware, software, operating systems, peripherals, cabling, and networks.

***If I major in Computer and Network Support can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 8 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Describe and analyze hardware and software, components of a network and their interrelations;

Explain network protocols and hierarchical relationships of hardware and software;

Compare protocol models and select appropriate protocols for a particular design;

Explain concepts and theories of networking and apply to various situations, which may involve classifying networks, analyzing performance, and implementing new technologies;

Use resources to stay abreast of latest industry tools and techniques analyzing impacts on existing and applying to future situations;

Manage multiple operating systems, systems software, network services, and security; and

Evaluate and compare systems software and emerging technologies.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Computer Aided Design Technology Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/computer-aided-design-cad-technology-certificate-achievement/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3205**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Computer Aided Design Technology?***

Certificate provides students with knowledge and skills needed to effectively use computer aided design (CAD) in any professional environment, such as civil, mechanical, and manufacturing engineering, as well as architecture, surveying, and construction.

***If I major in Computer Aided Design Technology can I transfer to an upper-division college or university?***



Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 12 credits each semester, certificate can be completed in one year, including taking courses in summer session.

***Upon completion of this program, graduates will be able to:***

Apply principles of engineering graphics to prepare detailed drawings using CAD software;

Demonstrate computer literacy in use of various CAD systems;

Use American National Standards Institute (ANSI) protocol for sizing and tolerancing of mating parts; Apply Geometric Dimension and Tolerancing (GD&T) techniques to engineering design; and Utilize 3D solid modeling CAD systems to create mechanical components and generate assembly designs.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Cybersecurity Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/cybersecurity-academic-certificate/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 3322**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Cybersecurity?***

Certificate provides students with knowledge and skills needed to effectively administer computer-based database systems in any professional environment.

***If I major in Cybersecurity can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 15 credits each semester, certificate can be completed in one year.

***Upon completion of this program, graduates will be able to:***

Manage multiple operating systems, systems software, network services and security;

Evaluate and compare systems software and emerging technologies;

Develop solutions for networking and security problems, balancing business concerns, technical issues, and security;

Identify infrastructure components and role they serve, and design infrastructure including devices, topologies, protocols, systems software, management, and security;

Use resources to stay abreast of industry tools and techniques analyzing impacts;

Explain concepts of confidentiality, availability, and integrity in Information Assurance, including physical, software, devices, policies, and people, and analyze these in an existing system and design implementations; and

Cite and comply with relevant industry and organizational codes of conduct and ethics.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Database System Administration Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/database-system-administration-academic-certificate/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 3324**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Database System Administration?***

Certificate provides students with knowledge and skills needed to effectively administer computer-based database systems in any professional environment.

***If I major in Database System Administration can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 12 credits each semester, certificate can be completed in one year.

***Upon completion of this program, graduates will be able to:***

Apply design theory to a database using appropriate database management systems;

Design, maintain, and monitor database server architecture including addressing performance optimization to meet system requirements;

Test software systems against specification, performance, maintenance, and quality requirements;

Apply software engineering theory, principles, tools, and processes, as well as computer science and mathematics theories and principles, to develop and maintain complex software systems; and

Evaluate impact of potential software engineering problem solutions as they fit into global societies by integrating knowledge of contemporary issues and emerging software engineering trends, models, tools, and techniques.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Electrical Code Technology Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/electrical-code-technology-certificate-achievement/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3051**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Electrical Code Technology?***

Certificate offers opportunity to fulfill credentials for state-approved licensing requirements adopted by the New Jersey Uniform Construction Code, administered by the Department of Community Affairs. Provides currently licensed code enforcement personnel means to upgrade educational credentials and prepares for inspector-related employment.

***If I major in Electrical Code Technology can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 6 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Evaluate construction plans in terms of compliance with state and local electrical codes;

Determine if construction conforms to approved plans;

Apply technical and administrative code-related knowledge in code enforcement;

Effectively use English language skills gained in program to comprehend and evaluate ideas in context of code enforcement, and communicate them both orally and in writing; and

Take National Certification Examination to become a licensed Electrical Code Inspector.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Fire Code Technology Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/fire-code-technology-certificate-achievement/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3050**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Fire Code Technology?***

Certificate offers opportunity to fulfill credentials for state-approved licensing requirements adopted by the New Jersey Uniform Construction Code, administered by the Department of Community Affairs. Provides currently licensed code enforcement personnel means to upgrade educational credentials and prepares for inspector-related employment.

***If I major in Fire Code Technology can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 6 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Evaluate construction plans in terms of compliance with state and local fire protection codes;

Determine if construction conforms to approved plans;

Apply technical and administrative code-related knowledge in code enforcement;

Effectively use English language skills gained in program to comprehend and evaluate ideas in context of code enforcement, and communicate them both orally and in writing; and

Take National Certification Examination to become a licensed Fire Protection Code Inspector.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Mechatronics Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/mechatronics-certificate-achievement/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3316**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Mechatronics?***

Certificate introduces students to fundamental concepts of mechatronics which is essential in almost every segment of industry using automation, including things like electronics, robotics, computers, telecommunications, and machine control. Program provides additional training for students in engineering technology programs to enhance technical skills and thus improve employability.

***If I major in Mechatronics can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 15 credits each semester, certificate can be completed in one year, including courses in a summer session.

***Upon completion of this program, graduates will be able to:***

Design, develop, and implement a mechatronics system, including components like sensors and output devices;

Identify main components of programmable logic controllers, their functions, and classification;

Apply principles of engineering graphics to prepare detailed drawings using CAD software; and

Recognize and explain functions of control elements of a closed-loop system.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Plumbing Code Technology Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/plumbing-code-technology-certificate-achievement/>)**

**Division of Mathematics, Engineering Technologies, & Computer Sciences –**

**Curriculum Code: 3053**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Plumbing Code Technology?***

Certificate offers opportunity to fulfill credentials for state-approved licensing requirements adopted by the New Jersey Uniform Construction Code, administered by the Department of Community Affairs. Provides currently licensed code enforcement personnel means to upgrade educational credentials and prepares for inspector-related employment.

***If I major in Plumbing Code Technology can I transfer to an upper-division college or university?***

Certificate is job-oriented, not designed for baccalaureate transfer, but credits may be applied to an associate degree at ECC. Further, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 6 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Evaluate construction plans in terms of compliance with state and local plumbing codes;

Determine if construction conforms to approved plans;

Apply technical and administrative code-related knowledge in code enforcement;

Effectively use English language skills gained in program to comprehend and evaluate ideas in context of code enforcement, and communicate them both orally and in writing; and

Take National Certification Examination to become a licensed Plumbing Code Inspector.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.

**Software Development and Programming  
Certificate (<https://catalog.essex.edu/about-academic-divisions/math-engineering-technology-computer-science-division/software-development-programming-academic-certificate/>)**

**Division of Mathematics, Engineering  
Technologies, & Computer Sciences –**

**Curriculum Code: 3323**

**Will Earn Upon Completion: Certificate of Achievement**

***Why major in Software Development and Programming?***

Certificate introduces students to fundamental concepts of programming with emphasis on the whole software development process.

***If I major in Software Development Technology can I transfer to an upper-division college or university?***

Certificate is career oriented, not specifically designed for baccalaureate transfer. However, some credits earned may transfer to four-year institutions.

***Are there any requirements I must satisfy before I start taking courses in my major?***

Based on placement testing, you may be required to take developmental courses in English and/or Mathematics before taking courses in your major.

***How long will it take me to complete this certificate?***

If you do not need developmental courses and you register for an average of 6 credits each semester, certificate can be completed in two years, which may be shortened by taking courses in summer sessions.

***Upon completion of this program, graduates will be able to:***

Design, develop, and implement a major software-based project;

Test software systems with specification, performance, maintenance, and quality requirements;

Apply software engineering theory, principles, tools, and processes, as well as theory and principles of computer science and mathematics, to the development and maintenance of complex software development systems;

Evaluate impact of potential solutions to software engineering problems in a global society, using knowledge of contemporary issues and emerging software engineering trends, models, tools, and techniques;

Create interactive Web applications; and

Design and develop mobile applications for the Android platform.

***Where should I direct specific questions?***

Contact the Division (973) 877-3302.