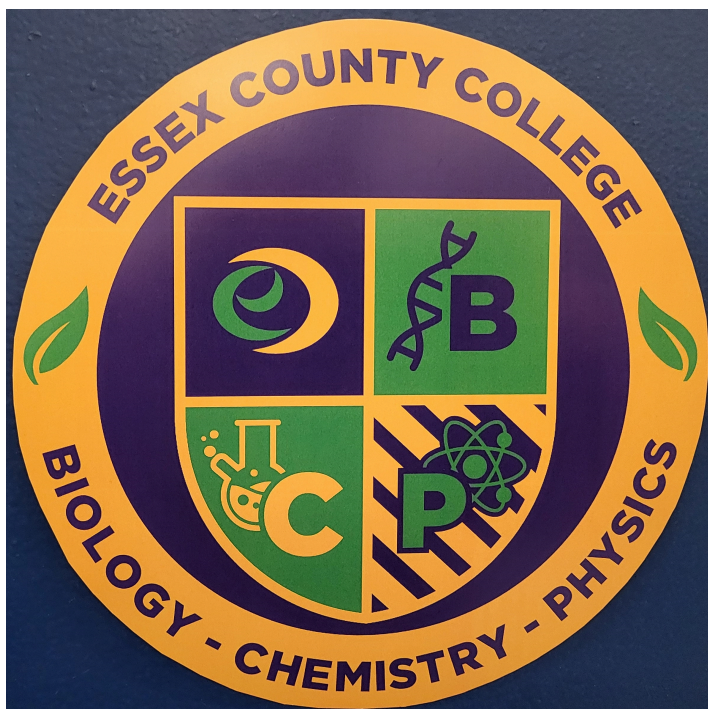


# DIVISION OF BIOLOGY, CHEMISTRY AND PHYSICS



This division offers A.S. degree programs to prepare students for transfer to 4-year colleges or universities. Faculty hold advanced degrees in Biology, Chemistry, Environmental Science, or Physics, are experienced in teaching and, in addition, most faculty have extensive research experience in their fields. Students have access to multimedia, computer laboratories with internet access, and state-of-the-art equipment.



**Location:** Level II, Blue Area, Second Floor

**Divisional Contact Number:** 973-877-3430

**Chairperson:** Eunice Kamunge (kamunge@essex.edu), (973-877-3271)

**Administrative Assistant:** Aissatou Barry (abarry@essex.edu, 973-877-3430)

**Laboratory Manager:** Kanji Ojelade (kojelade@essex.edu, 973-877-3282)

**Laboratory Assistants:** Samuel Amoakehene (samoakoh@essex.edu), Yuliana Castillo (ycastil1@essex.edu), Evelyn Garcia (egarcia2@essex.edu, and Nabil Kabakibi (nkabakib@essex.edu)

Faculty	Discipline
Ezdehar Abu-Hatab (abuhatab@essex.edu, x3181)	Biology
Ahmad Ali (aali29@essex.edu, x2169)	Physics
Emmanuel Aouad (eaouad@essex.edu, x3584)	Chemistry
Martin Asobayire (asobayire@essex.edu, x1862)	Biology
Jose Chestnut (chestnut@essex.edu, x3573)	Biology
Frank Duroy (duroy@essex.edu, x3262)	Biology
Yasser Kabakibi (ykabakib@essex.edu, x3429)	Biology
Nicole Koribanics (nkoriban@essex.edu, x3138)	Biology
Jeffrey Lee (lee@essex.edu, x3234)	Biology
Nadezhda Lvov (lvov@essex.edu, x4428)	Physics
Nidhal Marashi (nmarashi@essex.edu, x3370)	Physics
Kanji Ojelade (kojelade@essex.edu, x3282)	Biology
Philip Okoro (pokoro1@essex.edu, x4405)	Biology
Sujatha Ramakrishnan (sramakri@essex.edu, x3327)	Biology
Maria Cecilia Rozak (rozak@essex.edu, x3595)	Physics
Pablo Ramos Silva (pramossi@essex.edu, x3531)	Chemistry
Lynn Wilson (lwilson@essex.edu, x3213)	Biology

## Biology/Pre-Medicine

Curriculum Code: 0601

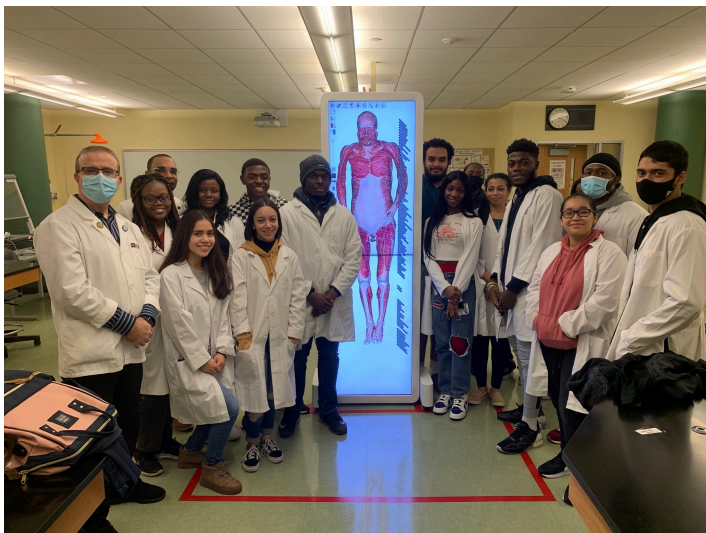
**Will Earn Upon Program Completion:** Associate in Science (A.S.) Degree

### Why major in Biology/Pre-Medicine?

Biology is the primary life science from which students can enter specific fields of study as diverse as molecular biology, forestry, pathophysiology, neuroanatomy, and parasitology. Biology also provides foundations for students wishing to become physicians, dentists, or other medical professionals. Curriculum is equivalent to the first two years of a baccalaureate program in Biology. Emphasis is placed on scientific method and critical analysis that enables you to be a contributor to any scientific or medical team.

***If I major in Biology/Pre-Medicine, can I transfer to an upper-division college or university?***

The Associate in Science degree in Biology/Pre-Medicine prepares you for transfer to upper-division colleges and universities to pursue a bachelor's degree. ECC's transfer/ articulation agreements with area four-year institutions provide smooth transfer for graduates.



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

Evaluation and placement is required for all majors. Major courses begin once you have completed all developmental courses. In addition, when at the final level of remediation in Mathematics and English, you can take either BIO 100 or CHM 100. While neither of these count toward graduation in this major, they introduce you to basic biology and/or chemistry that prepares you for this program.

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

If you do not need developmental courses or College Mathematics (MTH 100), and you take an average of 16 credits per semester, you should be able to complete the program in two years. You can shorten the amount of time by taking summer courses.

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

- Utilize critical thinking and problem-solving skills, including the scientific method, qualitative and quantitative data analysis;
- Demonstrate mastery of fundamental concepts of biology at the molecular and cellular levels;
- Demonstrate mastery of fundamental concepts of biology at the organismal, community and ecosystem levels; and
- Perform scientific investigations using proper laboratory instrumentations and laboratory procedures.

***Where should I direct specific questions about this program?***

Call the Division at (973) 877-3430.

## **Biology/Pre-Medicine MD Option**

Curriculum Code: 061G

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

***Why major in Biology/Pre-Medicine MD Option?***

The major in Biology/Pre-Medicine MD Option provides opportunity for students interested in pursuing careers in medicine. Upon completion of coursework, graduates are eligible to apply for admission into a 5-year M.D. program at St. George's University, Grenada, West Indies.



***If I major in Biology/Pre-Medicine MD Option, can I transfer to an upper-division college or university?***

The Biology/Pre-Medicine MD Option is specifically designed to meet undergraduate (pre-medicine) requirements for admission into the 5-year M.D. program at St. George's University. However, credits are also transferable to baccalaureate programs (B.S. or B.A.) in Biology or related majors at other colleges and universities.

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

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

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

If you do not need developmental courses and you register for an average of 17 credits per semester, you can complete the A.S. program in two years. You can shorten the length of the time by taking summer courses.

***Upon completion graduates will be able to:***

- Utilize critical thinking and problem-solving skills to become avid learners; and
- Apply for entry into a 5-year M.D. program by demonstrating mastery in biology, inorganic chemistry, organic chemistry, and physics.

Through its administration by the Division of Biology, Chemistry and Physics, the Biology/Pre-Medicine MD Option program demands academic rigor. The minimum required GPA is 3.5.

***Where should I direct specific questions about this program?***

Call the Division at (973) 877-3430.





## Chemistry

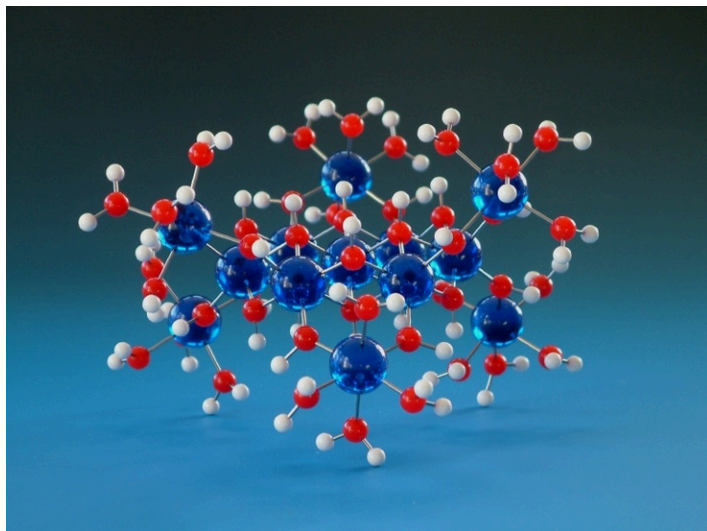
Curriculum Code: 0602

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



### Why major in Chemistry?

Chemistry is essential to fields such as biology, medicine, dentistry, chemical engineering, pharmacology, forensics, and polymer science. Chemists are in high demand and often go on to senior leadership levels in corporations. Curriculum is equivalent to first two years of a baccalaureate Chemistry program.



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

The A.S. degree in Chemistry prepares you for transfer to upper-division bachelor's degree programs. ECC's agreements with area four-year institutions provide smooth transfer.

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

Basic skills testing is required for all majors. Major courses begin once developmental ones are completed. In addition, when at final remediation levels, you can take CHM 100. While this does not count toward graduation in this major, it introduces basic chemical principles and theories that you will be learning in this program.

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

If remedial courses are not needed and you average 16 credits per semester, program can be completed in two years; which can be shortened by taking summer courses.

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

- Utilize critical thinking and problem solving skills, including the scientific method and method of scientific conversion;

- Understand fundamental concepts of inorganic chemistry, including the chemical laws of nature, solutions, acids & bases, kinetics, equilibrium, and thermochemistry, thermodynamics, electrochemistry, and nuclear chemistry;
- Demonstrate mastery of fundamental concepts of organic chemistry, including functional groups, reactions, syntheses, and mechanisms;
- Perform chemical experiments in a safe and scientific manner, using proper scientific and laboratory safety procedures.

**Where should I direct specific questions about this program?**

Call the Division at (973) 877-3430.

## Environmental Science

Curriculum Code: 2207

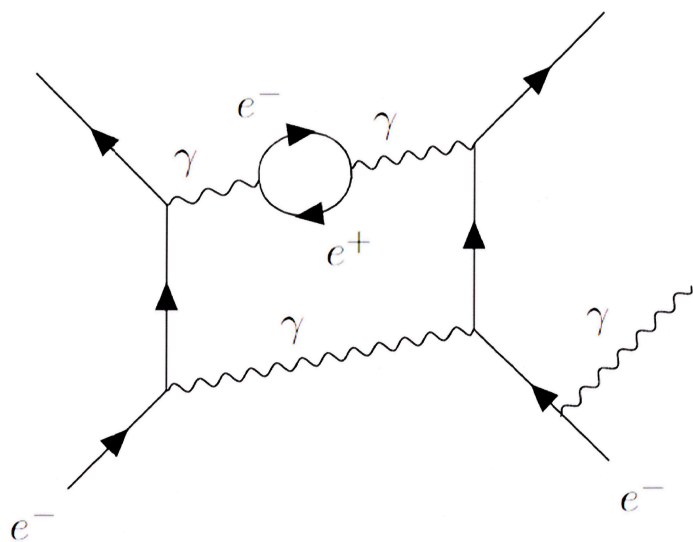
**Will Earn Upon Program Completion: Associate in Science (A.S.) Degree**

**Why major in Environmental Science?**

The Environmental Science Program provides opportunities for students interested in the environment and related fields. This major begins to prepare you for careers in environmental, remediation, petroleum and civil engineering fields as laboratory technicians, field analysts, and environmental technicians. With experience, you may find positions in additional areas such as research, production, and consumer service.

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

The A. S. degree in Environmental Science prepares you for transfer to upper-division colleges and universities to pursue a



bachelor's degree. ECC's transfer/ articulation agreements with area four-year institutions provide smooth transfer for our A.S. graduates.

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

Basic skills testing is required for all majors. Major courses begin once all developmental courses are completed. When at final levels of remediation in Mathematics and/or English, you can take either BIO 100 or CHM 100. While neither of these courses count toward graduation

in this major, they introduce you to basic biology and chemistry that prepares you for this program.

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

If you do not need developmental courses and an average of 16 credits per semester, the program can be completed in two years; which can be shortened by taking courses in summer session.

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

- Students will be able to describe the fundamental concepts of Geology and Environmental Science, including the origin, composition; and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans;
- Students will be able to effectively communicate and critically evaluate scientific observations, analyses and ideas;
- Students will be able to scientifically collect, analyze, and interpret geologic, geoscience, and earth systems data.

**Where should I direct specific questions about this program?**

Call the Division at (973) 877-3430.

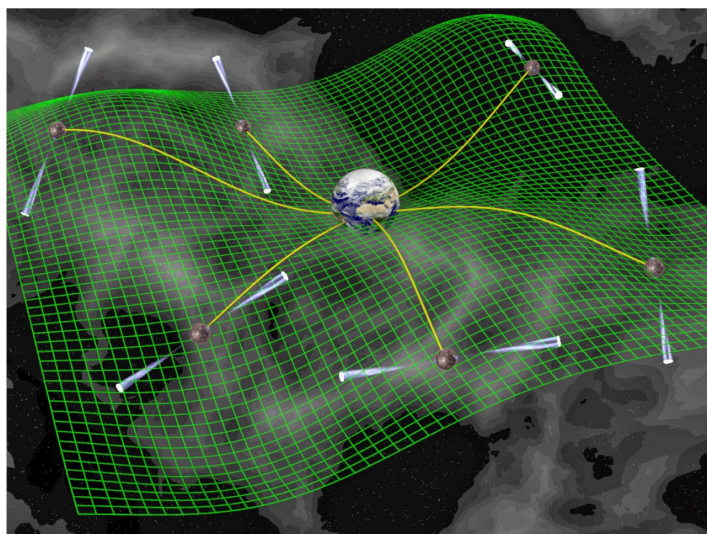
## General Science

Curriculum Code: 0603

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

**Why major in General Science?**

The General Science program provides opportunities for students interested in health care-related fields as well as those interested in teaching science in grades K-12 to complete a general basic science associate's degree. Students applying to Nursing & Health Sciences programs can complete prerequisites for these programs, while in this major. While waiting for acceptance into a professional program, students can pursue remaining degree requirements. Curriculum provides a foundation in core courses needed to major in many areas of science and health care. Emphasis is placed on the scientific method and critical analysis that enables you to be a contributor to any scientific or medical team.





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

The A. S. degree in General Science prepares you for transfer to upper-division colleges and universities to pursue a bachelor's degree. ECC's transfer/articulation agreements with area four-year institutions provide smooth transfer for our A.S. graduates.

***If I major in General Science, how do I apply to Nursing or Health Sciences Programs?***

See the curriculum guides in this catalog for specific admissions requirements for each program. You may also call the Nursing & Health Sciences Division at (973) 877-1868.

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

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

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

If you do not need developmental courses and you take an average of 16 credits per semester, you can complete the program in two years. You can shorten the amount of time by taking summer courses.

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

- Utilize critical thinking and problem-solving skills, including the scientific method and methods of scientific conversion;
- Demonstrate mastery of fundamental concepts of biology, chemistry, and/or physics; and
- Perform scientific investigations using proper scientific and laboratory safety protocols.

***Where should I direct specific questions about this program?***

Call the Division at (973) 877-3430.

## Physics

Curriculum Code: 0608

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



***Why major in Physics?***

Physics is the scientific study of matter and energy and is fundamental to understanding the natural world, including other natural



sciences like Chemistry and Biology. A degree in physics provides opportunities for challenging and exciting careers in the many subfields of Physics, as well as in many technical and non-technical professions. Since physics students learn transferable skills, they also find careers in a variety of other fields, including, among many others, astronomy, neuroscience, mathematics, computer science, high school science teaching, law, medicine, environmental sciences, finance, operations

research, marketing, industrial management, engineering, meteorology and oceanography.

Call the Division at (973) 877-3430.

***If I major in Physics, can I transfer to an upper division college or university?***

The A. S. degree in Physics prepares you for transfer to four-year colleges and universities to pursue a bachelor's degree. ECC's transfer/articulation agreements with area four-year institutions provide smooth transfer for our graduates.

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

Based on placement testing, you may have to take developmental courses in English and/or Mathematics before taking core courses in your major. Students are strongly recommended to take pre-calculus in high school or during the summer before beginning college calculus.

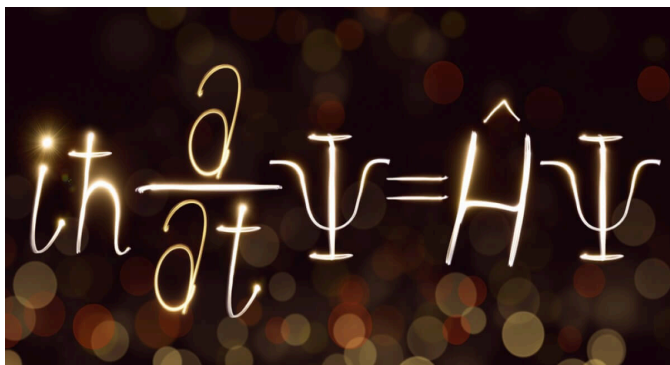


***How long will it take for me to complete this degree?***

If you do not need developmental course work and you register for an average of 16-17 credits each semester, you can complete the degree in two years. You may shorten the time by taking summer courses.

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

- Demonstrate an understanding of the principles of physics and the ability to apply these principles to problems of both fundamental and practical interest;



- Design and conduct experiments, and use the scientific method to analyze a problem and draw conclusions from data and observations;
- Apply critical thinking skills and ability to identify, formulate, and solve technical problems.

***Where should I direct specific questions about this program?***