

SCIENCE, TECHNOLOGY, ENGINEERING AND MATH

STEM Associate in Science Degree (CIP # 1641030100)

Specializations Available:

- Engineering - articulates to University of Central Florida's B.S. in Engineering
- Computer Science- articulates to University of Central Florida's B.S. in Computer Science
- Biological/Chemical Sciences
- Photonic Science and Engineering Specialization

The Associate in Science (A.S.) degree in Science, Technology, Engineering and Math (A.S. STEM) at Valencia College is a program that prepares students to successfully transfer to a baccalaureate program with junior class standing and seek a career in the industry. Students will complete the required 36 hours of general education credits for the bachelor degree along with the elective courses geared towards a specific major.

Upon graduating from this program, Valencia students are eligible to enter a baccalaureate program at the University of Central Florida as a junior through the Direct Connect agreement. Other universities may have different requirements, so it is important to consult with both your transfer institution's catalog and a Valencia coach.

Start Right

Degree-seeking students enrolling at Valencia for the first time will have a limited range of courses from which to choose for their first 18 college-level credits. Within the first 18 college credit hours, you will be required to take ENC1101 (3 credits), and if applicable, SLS 1122 (3 credits) and a mathematics course appropriate to your selected meta-major (3 credits). The remaining courses will be chosen from the General Education Core Courses in humanities (3 credits), science (3 credits), or social science (3 credits), and/or the introductory courses within the A.S. degree programs. For specific courses see the *Foundation Courses* on the "Program Requirements" tab. For course sequencing recommendations, see your Student Success Coach or create an education plan by logging into MyVC, clicking on the LifeMap tab and clicking My Education Plan.

Salary & Earnings Information

For career information related to this program, please visit **O*Net OnLine**.

Contacts

Future Students

To learn more about this program, contact Enrollment Services at enrollment@valenciacollege.edu or 407-582-1507

Current Students

Your Student Success Coach contact information can be found in MyVC. Log into MyVC, click on the Courses tab, and check your Academic Profile information to find a link to your Coach.

Program Chair

Mohua Kar: 407-582-1182
mkar@valenciacollege.edu

Internship and Workforce Services

If you need assistance with job resources or in locating an internship, please visit: valenciacollege.edu/internship (<https://valenciacollege.edu/internship/>)

Program Outcomes

- Solve application problems based on math and science concepts.
- Draw evidence-based conclusions using logical, scientific, and mathematical reasoning.
- Demonstrate readiness for academic transfer by applying content knowledge to solve discipline- specific problems.

Engineering Specializations:

- Identify, formulate, and solve real-world engineering problems by applying principles of engineering, science, and mathematics.

Computer Science Specializations:

- Design, develop, test, and document software applications that solve discipline-specific problems using industry-standard programming languages, tools, and methodologies.

Biological/Chemical Sciences Specialization:

- Apply laboratory practices to explore scientific concepts.

Photonic Science and Engineering Specialization:

- Apply principles of engineering, physics, mathematics, and optics to identify, analyze, and model open-ended engineering problems, and to evaluate potential solutions using appropriate analytical and experimental methods in preparation for success in upper division level coursework.

Program Requirements

Core Courses

| Communications | | |
|-----------------------------------|---|-----------|
| ENC 1101 | FRESHMAN COMPOSITION I ^{*+~} | 3 |
| ENC 1102 | FRESHMAN COMPOSITION II ^{*+~} | 3 |
| SPC 1608 | FUNDAMENTALS OF SPEECH [~] | 3 |
| | or SPC 1017 INTERPERSONAL COMMUNICATION | |
| Humanities | | |
| Humanities | See Gen. Ed. Core requirement [~] | 3 |
| Mathematics | | |
| MAC 2311 | CALCULUS WITH ANALYTIC GEOMETRY I [*] _{+~1GR} | 4 |
| MAC 2312 | CALCULUS WITH ANALYTIC GEOMETRY II [*] _{+~2GR} | 4 |
| Science | | |
| CHM 1045C | GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I ^{*+~3} | 4 |
| PHY 2048C | GENERAL PHYSICS WITH CALCULUS I ^{*+~4} | 4 |
| Social Science | | |
| POS 2041 | U.S. GOVERNMENT [~] | 3 |
| | or AMH 2010 UNITED STATES HISTORY TO 1877 | |
| | or AMH 2020 U.S. HISTORY 1877 TO PRESENT | |
| Specialization (see below) | | 33 |
| Total Credit Hours | | 64 |

* This course has a prerequisite; check description in Valencia catalog.

+ This course must be completed with a grade of C or better.

~ This is a general education course.

(GB) denotes a Gordon Rule course.

¹ Biology and Biomedical majors can take MAC 2233 instead of MAC 2311

² Biology and Biomedical majors must take STA 2023 instead of MAC 2312

³ Computer Science major can take BSC 1010C instead of CHM 1045C

⁴ Biology and Biomedical majors can take PHY 1053C instead of PHY 2048C

Engineering Specialization

This specialization academically prepares students by providing the Engineering, Physics and Mathematics foundation courses required to success in a baccalaureate engineering program. Upon graduating from this specialization, Valencia students are eligible to enter into the Bachelor of Science in Engineering degree program at the University of Central Florida, with junior standing, through the Direct Connect articulation agreement, and seek a career in industry. Other universities may have additional requirements, so it is important to consult with both your transfer institution's catalog and a Valencia Student Success Coach.

Students declaring a major in an engineering discipline must be in good academic standing and must have a "C" (2.0) or better in each of the following prefix courses or their equivalents: MAC, MAP, PHY, CHM, EGS and EGN.

Engineering Specialization

| | | |
|---|---|-----------|
| EGS 1006C | INTRODUCTION TO THE ENGINEERING PROFESSION ⁺ | 1 |
| EGN 1007C | ENGINEERING CONCEPTS & METHODS ^{*+} | 1 |
| EGN 2440 | PROBABILITY AND STATISTICS FOR ENGINEERS ^{*+} | 3 |
| MAC 2313 | CALCULUS WITH ANALYTICAL GEOMETRY III ^{*+} | 4 |
| MAP 2302 | DIFFERENTIAL EQUATIONS ^{*+} | 3 |
| PHY 2049C | GENERAL PHYSICS WITH CALCULUS II ^{*+~} | 4 |
| Student Choice Gen Ed [~] | | 3 |
| Specific Engineering Electives based on engineering major (see list below) [^] | | 14 |
| Total Credit Hours | | 33 |

* This course has a prerequisite; check the description in the Valencia catalog.

+ This course must be completed with a grade of C or better.

~ This is General Education course

[^] Specific Electives select from the list below (Please Consult with an Advisor)

[^]Specific Engineering Electives based on engineering major

| | | |
|---|--|---|
| Aerospace, Industrial, and Mechanical Engineering | | |
| EGN 2312 | ENGINEERING ANALYSIS-STATICS ^{*+} | 3 |
| EGN 2322 | ENGINEERING ANALYSIS-DYNAMICS ^{*+} | 3 |
| EGS 2373 | PRINCIPLES OF ELECTRICAL ENGINEERING ^{*+} | 3 |
| EGN 2210C | NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS ^{*+} | 3 |
| or COP 2220C | C PROGRAMMING | |

| | | | |
|--------------------------------------|--|--|---|
| Electives | | | 2 |
| Civil Engineering | | | |
| EGN 2312 | ENGINEERING ANALYSIS-STATICS ^{*+} | | 3 |
| EGN 2322 | ENGINEERING ANALYSIS-DYNAMICS ^{*+} | | 3 |
| EGN 2332C | MECHANICS OF MATERIALS ^{*+} | | 3 |
| Electives | | | 5 |
| Computer, and Electrical Engineering | | | |
| EGS 2004C | ELECTRICAL NETWORKS ^{*+} | | 3 |
| EGN 2210C | NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS ^{*+} | | 3 |
| EGN 2421 | ENGINEERING ANALYSIS ^{*+} | | 3 |
| Electives | | | 5 |
| Environmental Engineering | | | |
| EGN 2312 | ENGINEERING ANALYSIS-STATICS ^{*+} | | 3 |
| EGN 2332C | MECHANICS OF MATERIALS ^{*+} | | 3 |
| CHM 1046C | GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II ^{*+} | | 4 |
| Electives | | | 4 |
| Material Sciences and Engineering | | | |
| EGS 2373 | PRINCIPLES OF ELECTRICAL ENGINEERING ^{*+} | | 3 |
| EGN 2210C | NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS ^{*+} | | 3 |
| CHM 1046C | GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II ^{*+} | | 4 |
| Electives | | | 4 |
| Construction Engineering | | | |
| EGN 2312 | ENGINEERING ANALYSIS-STATICS ^{*+} | | 3 |
| EGN 2332C | MECHANICS OF MATERIALS ^{*+} | | 3 |
| Electives | | | 8 |

Computer Science Specialization

This specialization prepares students academically with the Computer Programming, Physics, and Mathematics courses needed for transfer to a Bachelor's in Computer Science program. Upon graduating from this specialization, Valencia students are eligible to enter the Bachelor of Science in Computer Science at the University of Central Florida, with junior standing, through the Direct Connect articulation agreement, and seek a career in industry. Other universities may have additional requirements, so it is important to consult with both your transfer institution's catalog and a Valencia advisor.

Students declaring a major in Computer Science discipline must be in good academic standing and must have a "C" (2.0) or better in each of the following prefix courses or their equivalents: MAC, PHY, CHM, BSC, COP and STA.

Computer Science Specialization

| | | |
|--------------|---|---|
| COP 1000C | INTRODUCTION TO PROGRAMMING CONCEPTS ⁺ | 3 |
| COP 2220C | C PROGRAMMING ^{*+} | 3 |
| COP 2800C | JAVA PROGRAMMING ^{*+} | 3 |
| COP 2805C | ADVANCED JAVA PROGRAMMING ^{*+} | 3 |
| CHM 1046C | GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II ^{*+~} | 4 |
| or BSC 1010C | GENERAL BIOLOGY I | |

| | | |
|---------------------------|---|-----------|
| PHY 2049C | GENERAL PHYSICS WITH CALCULUS II ^{*+~} | 4 |
| STA 2023 | STATISTICAL METHODS ^{*+~} | 3 |
| MAC 2313 | CALCULUS WITH ANALYTICAL GEOMETRY III ^{*+} | 4 |
| MAP 2302 | DIFFERENTIAL EQUATIONS ^{*+} | 3 |
| Elective | | 3 |
| Total Credit Hours | | 33 |

* This course has a prerequisite; check the description in the Valencia catalog.

+ This course must be completed with a grade of C or better.

~ This is a general education course.

Biological/Chemical Sciences Specialization

This specialization prepares students academically with the Biology, Chemistry, Physics, and Mathematics courses needed for advanced study in these specialized fields (BS in Biology or Biomedical or Biochemistry or Chemistry). Upon graduating from this specialization, Valencia students are eligible to enter a science bachelor's degree at the University of Central Florida, with junior standing, through the Direct Connect agreement, and seek a career in industry. Other universities may have additional requirements, so it is important to consult with both your transfer institution's catalog and a Valencia advisor.

Students declaring a major in Biological or Chemical Sciences discipline must be in good academic standing and must have a "C" (2.0) or better in each of the following prefix courses or their equivalents: MAC, PHY, CHM, and BSC.

| | | |
|---|--|-----------|
| Biological/Chemical Sciences Specialization | | |
| BSC 1010C | GENERAL BIOLOGY I ^{*+~} | 4 |
| BSC 1011C | GENERAL BIOLOGY II ^{*+^} | 4 |
| | or MAC 2313 CALCULUS WITH ANALYTICAL GEOMETRY III | |
| CHM 1046C | GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II ^{*+} | 4 |
| CHM 2210C | ORGANIC CHEMISTRY I ^{*+~} | 4 |
| CHM 2211C | ORGANIC CHEMISTRY II ^{*+~} | 4 |
| PHY 2054C | COLLEGE PHYSICS II WITH ALGEBRA AND TRIGONOMETRY ^{*+~1} | 4 |
| | or PHY 2049C GENERAL PHYSICS WITH CALCULUS II | |
| Electives | | 9 |
| Total Credit Hours | | 33 |

* This course has a prerequisite; check the description in the Valencia catalog.

+ This course must be completed with a grade of C or better.

~ This is a general education course.

[^] Biochemistry and Chemistry majors take MAC 2313; Biology, Biomedical and Forensic Science majors take BSC 1011C

¹ Biochemistry and Chemistry majors take PHY 2049C; Biology, Biomedical and Forensic Science majors can take either PHY 2054C or PHY 2049C

Photonic Science and Engineering Specialization

This specialization academically prepares students by providing Engineering, Physics, Mathematics, and Optics fundamental courses required to success in a baccalaureate photonics program. Upon graduating from this specialization, Valencia students are eligible to enter a Bachelor of Science degree in Photonic Science and Engineering at the College of Optics and Photonics (CREOL – UCF) with junior standing, through the Direct Connect agreement, and/or seek a career in industry.

Students declaring a major in Photonic Science and Engineering discipline must be in good academic standing and must have a "C" (2.0) or better in each of the following prefix courses or their equivalents: MAC, MAP, PHY, CHM, EGS and ETS.

| | | |
|---------------------------|---|-----------|
| EGS 1006C | INTRODUCTION TO THE ENGINEERING PROFESSION ⁺ | 1 |
| EGN 1007C | ENGINEERING CONCEPTS & METHODS ^{*+} | 1 |
| ETS 1211C | INTRODUCTION TO PHOTONICS ENGINEERING DESIGN ⁺ | 1 |
| ETS 2210C | PRINCIPLES OF PHOTONICS ^{*+} | 3 |
| ETS 2215 | GEOMETRIC OPTICS ^{*+} | 3 |
| ETS 2215L | GEOMETRIC OPTICS LABORATORY ^{*+} | 1 |
| ETS 2212 | FOUNDATIONS OF PHOTONICS ^{*+} | 3 |
| ETS 2212L | FOUNDATIONS OF PHOTONICS LABORATORY ^{*+} | 1 |
| EGS 2004C | ELECTRICAL NETWORKS ^{*+} | 3 |
| EGN 2421 | ENGINEERING ANALYSIS ^{*+} | 3 |
| MAC 2313 | CALCULUS WITH ANALYTICAL GEOMETRY III ^{*+} | 4 |
| MAP 2302 | DIFFERENTIAL EQUATIONS ^{*+} | 3 |
| PHY 2049C | GENERAL PHYSICS WITH CALCULUS II ^{*+} | 4 |
| Student Choice Gen Ed | | 2 |
| Total Credit Hours | | 33 |

* This course has a prerequisite; check the description in the Valencia catalog.

+ This course must be completed with a grade of C or better.