

# 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 two-year 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 advisor.

### 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 Career Program Advisor or create an education plan by logging into Atlas, 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](mailto:enrollment@valenciacollege.edu) or 407-582-1507

#### Current Students

Your Career Program Advisor contact information can be found in Atlas. Log into Atlas, click on the Courses tab, and check your Academic Profile information to find a link to your Advisor.

#### Program Chair

Mohua Kar: 407-582-1182  
[mkar@valenciacollege.edu](mailto:mkar@valenciacollege.edu)

### Internship and Workforce Services

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

### Program Outcomes

- Solve application problems based on math and science concepts.
- Formulate conclusions based on logic, scientific reasoning, and/or mathematical evidence.
- Demonstrate the readiness for transfer to a bachelor's degree and/or a career.

#### Engineering Specializations:

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

#### Computer Science Specializations:

- Create software solutions to discipline-relevant problems.

#### Biological/Chemical Sciences Specialization:

- Apply laboratory practices to explore scientific concepts.

#### Photonic Science and Engineering Specialization:

- Solve open-ended Engineering problems using concepts from Engineering, Physics, Mathematics, and Optics

## Program Requirements

### Core Courses

Communications		
SLS 1122	NEW STUDENT EXPERIENCE ~	3
ENC 1101	FRESHMAN COMPOSITION I <sup>*,+~</sup>	3
ENC 1102	FRESHMAN COMPOSITION II <sup>*,+~</sup>	3
SPC 1608	FUNDAMENTALS OF SPEECH ~	3
or SPC 1017	INTERPERSONAL COMMUNICATION	
Humanities		
Humanities	See Gen. Ed. Core requirement ~	3
Humanities	See Gen. Ed. Institutional requirement <sup>*</sup> <sup>+~GR</sup>	3
Mathematics		
MAC 2311	CALCULUS WITH ANALYTIC GEOMETRY I <sup>*</sup> <sup>+~GR</sup>	4
MAC 2312	CALCULUS WITH ANALYTIC GEOMETRY II <sup>*</sup> <sup>+~^GR</sup>	4
Science		
CHM 1045C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I <sup>*,+~</sup>	4
PHY 2048C	GENERAL PHYSICS WITH CALCULUS I <sup>*,+~1</sup>	4
Social Science		
POS 2041	U.S. GOVERNMENT ~	3
or AMH 2020	U.S. HISTORY 1877 TO PRESENT	
Social Sciences	See Gen. Ed. Institutional requirement <sup>*</sup> <sup>+~GR</sup>	3
<b>Specialization (see below)</b>		<b>24</b>
<b>Total Credit Hours</b>		<b>64</b>

\* 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) notes a Gordon Rule course.

<sup>^</sup> Biology and Biomedical majors must take STA 2023 instead of MAC 2312

<sup>1</sup> 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 advisor.

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 <sup>+</sup>	1
EGN 1007C	ENGINEERING CONCEPTS & METHODS <sup>*+</sup>	1
EGN 2440	PROBABILITY AND STATISTICS FOR ENGINEERS <sup>*+</sup>	3
MAC 2313	CALCULUS WITH ANALYTICAL GEOMETRY III <sup>*+</sup>	4
MAP 2302	DIFFERENTIAL EQUATIONS <sup>*+</sup>	3
PHY 2049C	GENERAL PHYSICS WITH CALCULUS II <sup>*+</sup>	4
Specific Engineering Electives based on engineering major (see list below) <sup>^</sup>		8
<b>Total Credit Hours</b>		<b>24</b>

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

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

<sup>^</sup> Specific Electives select from the list below (Please Consult with an Advisor)

<sup>^</sup>Specific Engineering Electives based on engineering major

Aerospace, Industrial, and Mechanical Engineering		
EGN 2312	ENGINEERING ANALYSIS-STATICS <sup>*+</sup>	3
EGN 2322	ENGINEERING ANALYSIS-DYNAMICS <sup>*+</sup>	3
EGS 2373	PRINCIPLES OF ELECTRICAL ENGINEERING <sup>*+</sup>	3
Civil, and Construction Engineering		
EGN 2312	ENGINEERING ANALYSIS-STATICS <sup>*+</sup>	3
EGN 2322	ENGINEERING ANALYSIS-DYNAMICS <sup>*+</sup>	3
Computer, and Electrical Engineering		
EGS 2004C	ELECTRICAL NETWORKS <sup>*+</sup>	3

EGN 2210C	NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS <sup>*+</sup>	3
Environmental Engineering		
EGN 2312	ENGINEERING ANALYSIS-STATICS <sup>*+</sup>	3
EGN 2322	ENGINEERING ANALYSIS-DYNAMICS <sup>*+</sup>	3
CHM 1046C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II <sup>*+</sup>	4
Material Sciences and Engineering		
EGS 2373	PRINCIPLES OF ELECTRICAL ENGINEERING <sup>*+</sup>	3
EGN 2210C	NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS <sup>*+</sup>	3
CHM 1046C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II <sup>*+</sup>	4
Photonics Sciences and Engineering		
EGS 2004C	ELECTRICAL NETWORKS <sup>*+</sup>	3
EGN 2210C	NUMERICAL COMPUTATIONS & PROGRAMMING FOR ENGINEERS <sup>*+</sup>	3
BSC 1010C	GENERAL BIOLOGY I <sup>*+</sup>	4

## 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 <sup>+</sup>	3
COP 2220C	C PROGRAMMING <sup>*+</sup>	3
COP 2800C	JAVA PROGRAMMING <sup>*+</sup>	3
COP 2805C	ADVANCED JAVA PROGRAMMING <sup>*+</sup>	3
CHM 1046C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II <sup>*+</sup>	4
or BSC 1010C	GENERAL BIOLOGY I	
PHY 2049C	GENERAL PHYSICS WITH CALCULUS II <sup>*+</sup>	4
STA 2023	STATISTICAL METHODS <sup>*+~</sup>	3
Math Elective <sup>^</sup>		1
<b>Total Credit Hours</b>		<b>24</b>

\* 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.

<sup>^</sup> Math Electives for Computer Science Specialization (choose one): (Please consult with an Advisor) MAC 2313, MAP 2302

## 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 <sup>*+~</sup>	4
BSC 1011C	GENERAL BIOLOGY II <sup>*+^</sup>	4
or MAC 2313	CALCULUS WITH ANALYTICAL GEOMETRY III	
CHM 1046C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II <sup>*+</sup>	4
CHM 2210C	ORGANIC CHEMISTRY I <sup>*+</sup>	4
CHM 2211C	ORGANIC CHEMISTRY II <sup>*+</sup>	4
PHY 2054C	COLLEGE PHYSICS II WITH ALGEBRA AND TRIGONOMETRY <sup>*+2</sup>	4
or PHY 2049C	GENERAL PHYSICS WITH CALCULUS II	
<b>Total Credit Hours</b>		<b>24</b>

\* 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.

<sup>^</sup> Biochemistry and Chemistry majors take MAC 2313; Biology, Biomedical and Forensic Science majors take BSC 1011C

<sup>2</sup> Biochemistry and Chemistry majors take PHY 2049C; Biology, Biomedical and Forensic Science majors can take either PHY 1054C 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 <sup>+</sup>	1
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ETS 1211C	INTRODUCTION TO PHOTONICS ENGINEERING DESIGN <sup>+</sup>	1
ETS 2210C	PRINCIPLES OF PHOTONICS <sup>*+</sup>	3
ETS 2215	GEOMETRIC OPTICS <sup>*+</sup>	3
ETS 2215L	GEOMETRIC OPTICS LABORATORY <sup>*+</sup>	1
ETS 2212	FOUNDATIONS OF PHOTONICS <sup>*+</sup>	3
ETS 2212L	FOUNDATIONS OF PHOTONICS LABORATORY <sup>*+</sup>	1
EGS 2004C	ELECTRICAL NETWORKS <sup>*+</sup>	3
MAP 2302	DIFFERENTIAL EQUATIONS <sup>*+</sup>	3
PHY 2049C	GENERAL PHYSICS WITH CALCULUS II <sup>*+</sup>	4
Math Elective <sup>^</sup>		1
<b>Total Credit Hours</b>		<b>24</b>

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

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

<sup>^</sup> Math Elective for Photonic Science and Engineering Specialization is MAC 2313

Students can also take EGN 1007C, EGN 2440, and EGN 2210C