

# BIOTECHNOLOGY LABORATORY SCIENCES

## Associate in Science Degree (CIP# 1341010100)

Valencia's Biotechnology Laboratory Sciences program will prepare you for one of the hottest emerging career fields today. Biotechnology is using the latest developments in genetics and molecular biology to create useful products for medicine, food, agriculture and alternative energy sources. Biotechnology technicians assist in conducting the laboratory tests, experiments and research that lead to these innovations.

Through Valencia's program, you'll learn the fundamentals of biotechnology while gaining hands-on experience through lab work and internship experience. The program emphasizes broad biology and chemistry concepts, basic microbiology, algebraic and statistical analysis, biohazard and safety procedures and core biotechnical laboratory techniques. College-level math is required.

Students are strongly encouraged to consult a student success coach in the department office for assistance in determining the best education plan for their career goals.

Although scheduling may not always provide for the following progression of courses, students should use the foundation, intermediate and advanced course sequence as a guide in program planning.

All degree-seeking students must satisfy entry testing requirements and satisfactorily complete all mandatory courses in reading, student success, mathematics, English, and English for Academic Purposes in which the student is placed.

## Instructional Methodology and Materials

Technical courses in this program use hands-on active learning in a lab environment. Advanced courses do not require the purchase of any instructional materials (such as textbooks).

## Alternative Ways to Earn Credit toward this Degree

Graduates of specific programs at Orange Technical College and Osceola Technical College, as well as other institutions may be eligible to receive college credit for courses in this program. You may also be eligible to receive credit toward this degree if you have earned one of the approved Gold Standard industry certifications or Career Pathways credit. To learn more about Valencia's award of credit options, visit <https://valenciacollege.edu/academics/programs/as-degree/credit-industry-certification-agreements.php>. Eligible students should contact the Student Success Coach in their academic department for more information about the requirements for the award of credit.

## College Credit Technical Certificates

The Biotechnology Laboratory Sciences A.S. degree also offers the following college credit certificate programs. These certificates can put you on the fast-track to reaching your career goals. They are designed to equip you with a specialized skill set for entry-level employment or to upgrade your skills for job advancement. Most can be completed in one year or less, and all of the courses in the certificates are embedded in the A.S. degree. You can earn the certificates as you progress through your A.S. Degree or as a separate, stand-alone credential. Click on the

Certificate tab at the top of the page for more information about the certificates that are offered.

- Biotechnology Laboratory Specialist (30 credits) (CIP # 0341010101)
- Biotechnology Specialist (19 credits) (CIP # 0641010100)

## 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** (<https://www.onetonline.org/>).

## Potential Careers

- Biotechnology Technician
- DNA Finger printer
- Cell Culture Technician
- Quality Control Technician
- Research Assistant
- Bio-Manufacturing Assistant
- Laboratory Technician

## Contacts

### Future Students

To apply to the program or learn more, contact Enrollment Services at [enrollment@valenciacollege.edu](mailto:enrollment@valenciacollege.edu) or 407-582-1507 or visit [valenciacollege.edu/biotechnology](https://valenciacollege.edu/biotechnology/) (<https://valenciacollege.edu/biotechnology/>).

### 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.

## 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) (<https://valenciacollege.edu/internship/>).

## Program Outcomes

- Students will demonstrate knowledge of the field of biotechnology.
- Students will demonstrate a working knowledge of chemistry and cell biology, as required for biotechnology.
- Students will be able to perform techniques relevant to biotechnology.
- Students will understand the biochemical properties of DNA, RNA and describe the PCR steps

- Students will demonstrate an understanding of the importance of following lab safety and proper lab documentation.

**Foundation Courses**

ENC 1101	FRESHMAN COMPOSITION I <sup>++~</sup> (GR)	3
BSC 1010C	GENERAL BIOLOGY I <sup>++~</sup>	4
SPC 1017	INTERPERSONAL COMMUNICATION <sup>~</sup> (GR)	3
or SPC 1608	FUNDAMENTALS OF SPEECH	
CHM 1045C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I <sup>++~</sup>	4

**Intermediate Courses**

ENC 1102	FRESHMAN COMPOSITION II <sup>++~</sup> (GR)	3
CHM 1046C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS II <sup>++</sup>	4
MCB 2010C	MICROBIOLOGY <sup>++~</sup>	4
Humanities	See Gen. Ed. Core requirement <sup>~</sup>	3
MAC 1105	COLLEGE ALGEBRA <sup>++~</sup>	3
POS 2041	U.S. GOVERNMENT <sup>~</sup> (GR)	3
or AMH 2020	U.S. HISTORY 1877 TO PRESENT	
or AMH 2010	UNITED STATES HISTORY TO 1877	
BSC 1421C	INTRODUCTION TO BIOTECHNOLOGY	4

**Advanced Courses**

BSC 2426C	BIOTECHNOLOGY METHODS I <sup>++</sup>	4
BSC 2427C	BIOTECHNOLOGY METHODS II <sup>++</sup>	4
BSC 2423C	PROTEIN BIOTECHNOLOGY AND CELL CULTURE <sup>++</sup>	4
STA 2023	STATISTICAL METHODS <sup>++~</sup>	3
Program Elective:	See Program Elective Options	3
Science Elective:	See Science Elective Options	4
BSC 2941	INTERNSHIP EXPLORATION IN BIOLOGY <sup>^</sup>	1
or CGS 2650	SOCIAL NETWORKING FOR JOB SEARCH	
or SLS 1301	CAREER DEVELOPMENT	

**Total Credit Hours** **61**

Program Electives - Choose one of the following:

ETI 1110	INTRODUCTION TO QUALITY ASSURANCE	3
CGS 2100C	COMPUTER FUNDAMENTALS AND APPLICATIONS	3
COP 1000C	INTRODUCTION TO PROGRAMMING CONCEPTS	3
GEB 1011	INTRODUCTION TO BUSINESS <sup>~</sup>	3
MAC 2311	CALCULUS WITH ANALYTIC GEOMETRY I <sup>~</sup>	4
ENC 1210	TECHNICAL COMMUNICATION	3
PHI 2600	ETHICS AND CRITICAL THINKING	3
PLS 1010C	INTRODUCTION TO PLANT SCIENCE	3
HSC 1004	INTRODUCTION TO HEALTH PROFESSIONS	3

Science Elective - Choose one of the following:

BSC 1011C	GENERAL BIOLOGY II <sup>~</sup>	4
BSC 2085C	HUMAN ANATOMY AND PHYSIOLOGY I <sup>~</sup>	4
PHY 2048C	GENERAL PHYSICS WITH CALCULUS I <sup>~</sup>	4
PHY 2053C	GENERAL PHYSICS I <sup>~</sup>	4
CHM 2210C	ORGANIC CHEMISTRY I	4
BOT 2010C	BOTANY	4

- + This course must be completed with a grade of C or better.
- \* This course has a prerequisite; check description in Valencia catalog.
- ~ This is a general education course.
- (GR) denotes Gordon Rule course
- ^ Special notes from the department

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- \* This course has a prerequisite; check description in Valencia catalog.
- ~ This is a general education course.

**Notes:**

Expand your career opportunities with a Bachelor's Degree in Business and Organizational Leadership (BASBOL) from Valencia. This degree builds on your skills, and prepares you for a supervisory or management role within your respective field. For more information, go to: Bachelor's Degree in Business & Organizational Leadership (<https://catalog.valenciacollege.edu/degrees/bachelorofscience/bas/>). Students who wish to continue their education should consult with a Career Program Advisor to determine the best education plan for their career goals.

Students wishing to transfer credits from this program to another institution must accept responsibility for securing approval from the transfer institution for acceptance of this degree.

## Biotechnology Laboratory Specialist

**Technical Certificate**

This certificate is designed to equip students with the foundational knowledge and skills that will prepare them for entry-level jobs and career advancement in the Biotechnology field. Areas of focus include biology and chemistry concepts, statistical analysis, laboratory techniques and concepts, laboratory documentation procedures, and biohazard and safety procedures.

**Program Outcomes**

- Students will demonstrate knowledge of the field of biotechnology.
- Students will demonstrate a working knowledge of chemistry and cell biology, as required for biotechnology.
- Students will be able to perform techniques relevant to biotechnology.
- Students will understand the biochemical properties of DNA, RNA and describe the PCR steps
- Students will demonstrate an understanding of the importance of following lab safety and proper lab documentation.

BSC 1010C	GENERAL BIOLOGY I <sup>++~</sup>	4
BSC 1421C	INTRODUCTION TO BIOTECHNOLOGY <sup>++~</sup>	4
MAC 1105	COLLEGE ALGEBRA <sup>++~</sup>	3
CHM 1045C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I <sup>++~</sup>	4
BSC 2426C	BIOTECHNOLOGY METHODS I <sup>++</sup>	4
BSC 2427C	BIOTECHNOLOGY METHODS II <sup>++</sup>	4
BSC 2423C	PROTEIN BIOTECHNOLOGY AND CELL CULTURE <sup>++</sup>	4
STA 2023	STATISTICAL METHODS <sup>++~</sup>	3
<b>Total Credit Hours</b>		<b>30</b>

- + This course must be completed with a grade of C or better.
- \* This course has a prerequisite; check description in Valencia catalog.
- ~ This is a general education course.

## Biotechnology Specialist

### Technical Certificate

This certificate is designed to equip students with the foundational knowledge and skills that will prepare them for entry-level jobs in the Biotechnology field. Areas of focus include broad biology and chemistry concepts, documentation procedures, basic lab techniques and concepts, as well as biohazard and safety procedures.

### Program Outcomes

- Demonstrate communication skills.
- Demonstrate safety skills.
- Demonstrate basic laboratory skills.
- Demonstrate regulatory compliance.
- Demonstrate appropriate decision making and problem solving techniques.
- Demonstrate quality assurance/control.
- Maintain facility and equipment.

BSC 1421C	INTRODUCTION TO BIOTECHNOLOGY <sup>+</sup> ~	4
BSC 1010C	GENERAL BIOLOGY I <sup>+</sup> *~	4
MAC 1105	COLLEGE ALGEBRA <sup>+</sup> *~	3
CHM 1045C	GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I <sup>+</sup> *~	4
BSC 2426C	BIOTECHNOLOGY METHODS I <sup>+</sup> *	4
<b>Total Credit Hours</b>		<b>19</b>

- + This course must be completed with a grade of C or better.
- \* This course has a prerequisite; check description in Valencia catalog.
- ~ This is a general education course.