

**APPLICATION FOR PROGRAM APPROVAL:
NEW or SUBSTANTIAL CHANGE or LOCALLY APPROVED
(This application may not exceed 3 pages)**

<u>Biotechnology</u>	<u>Emalee Mackenzie.</u>
PROPOSED PROGRAM TITLE <u>Irvine Valley College</u>	CONTACT PERSON <u>Professor</u>
COLLEGE <u>South Orange County Community College District</u>	TITLE <u>949-451-5211</u>
DISTRICT <u>Fall 2015</u>	PHONE NUMBER <u>emackenzie@ivc.edu</u>
PROJECTED PROGRAM START DATE	E-MAIL ADDRESS
GOAL(S) OF PROGRAM (CHECK ALL THAT APPLY):	
<input checked="" type="checkbox"/> CAREER TECHNICAL EDUCATION (CTE) <input type="checkbox"/> TRANSFER <input type="checkbox"/> OTHER	
TYPE OF PROGRAM (CHECK ALL THAT APPLY):	
<input type="checkbox"/> A.A. DEGREE <input checked="" type="checkbox"/> A.S. DEGREE <input checked="" type="checkbox"/> CERTIFICATE OF ACHIEVEMENT: <input type="radio"/> 18+ semester (or 27+ quarter) units <input type="radio"/> 12-18 semester (or 18-27 quarter) units	
REASON FOR APPROVAL REQUEST: (CHECK ONE)	
<input checked="" type="checkbox"/> NEW PROGRAM <input type="checkbox"/> SUBSTANTIAL CHANGE <input type="checkbox"/> LOCALLY APPROVED	

<i>Recommended Taxonomy of Program (TOP) Code</i>	0430.00
<i>Units for Major-Degree</i>	29
<i>Total Units for Degree</i>	60
<i>Required Units-Certificate</i>	37-39

1. Insert the description of the program as it will appear in the catalog.

This certificate/degree program is designed to prepare students for entry level jobs as laboratory assistants, biomanufacturing and biotechnology technicians, in fields such as biotechnology, medical devices, pharmaceuticals, biology, food safety, biomanufacturing and testing laboratories.

2. Provide a brief rationale for the program.

Irvine Valley College and our collaborators met with a biotechnology advisory committee in June 2012 which recommended developing a stackable certificate that would provide new students and incumbent workers with skills to enter and advance in this growing industry. Since that meeting, all four community colleges have worked together to research and plan for the implementation of such a certificate. The certificate will be comprised of courses intended to develop and ensure proficiency in specific lab-based skills as well as more traditional basic

biology and chemistry courses. We have proceeded in developing this program with the support of colleagues at Santiago Canyon College, Fullerton College and Wendie Johnson, director of the Pasadena City College LA/OC Biotechnology Economic Workforce Development Program. Considering the new biotechnology courses, the program will work with the campus articulation officer to determine the course transferability and articulation to CSU/UC.

3. List all courses required for program completion, including core requirements, restricted electives and prerequisites.

Certificate of Achievement: Biotechnology Lab Assistant (Beginning Fall 2015)

Requirements	Dept/Name#	Name	Units
Required Core (12 units)	Biot 70	Introduction to Biotechnology	3
	Biot 70L	Introduction to Biotechnology Lab	1
	Biot 273	Biotechnology A: Basic Lab Skills Biotechnology	4
	Chem 3	Fundamental Chemistry	4

Certificate of Achievement: Biomanufacturing Technician

Requirements	Dept/Name#	Name	Units
Required Core (23 units)	Biot 274	Biotechnology B: Proteins	4
	Biot 276	Quality and Regulation Compliance in the Biosciences	2
	Chemistry 1A	General Chemistry & Quantitative Analysis	5

A.S. Degree and Certificate of Achievement: Biotechnology Technician

Requirements	Dept/Name#	Name	Units
Required Core (29 units)	Biot 275	Biotechnology C: Nucleic Acids	4
	Biot 277	Cell Culture	2
General Emphasis (Choose 7-9 units)	Bio 15	General Microbiology	5
	Chem 1B	General Chemistry & Quantitative Analysis B	4
	Bio 10	Biochemistry for Health Sciences	4
	Biology 71	Human Genetics	3
	Biology 72	Stem Cells and Society	3
	Biology 16	Cell Biology	4
Choose one of the following (1 unit)	Biology 13 Or Biology 167	Introduction to Independent Research Cooperative Work Experience	1 1
	For A.S. degree: Major = 37-39 units + IVC GE required: 60 units total (some units double count)		

Los Angeles and Orange County Regional Consortia

Specialty Emphasis for IVC Campus Specialty (7-8 Units) To Be Developed in 2015-2016 with assistance from consortia and industry members****

4. Summarize the Labor Market outlook (including citation of the source of data) for students exiting the program.

The skills acquired by students completing this program will enable them to enter a large number of fields. Our interaction with industry indicates that they would hire certified individuals with skills over an individual with a B.S. without the skill-based training. According to the Labor Market Information of Estimated Employment and Projected Growth for industries who would employ completers of this program, the Net Annual Labor Demand is 377. This information was provided by the Center of Excellence. Furthermore, while reviewing the Chancellor’s Office Data Mart for historical completion rates for the community colleges in Los Angeles and Orange counties, the highest number of completions over the past five years for programs with a TOP code of 0430.00 was 20 (2010-2011). The labor market demand for students completing this program is strong.

According to EMSI Biotechnology (12/18/2014) labor market report for Orange County, biotechnology-related jobs are expected to increase by 4% over the next five years. By 2020, jobs are expected to increase from 5,844 to 6,064. Of these jobs, 193 (3%) will be openings and will provide opportunities for recent IVC graduates to pursue biotechnology-related careers. Median hourly earnings for these occupations in Orange County range from \$20.72 to \$76.35, with the overall median at \$60.42.

When including surrounding Los Angeles, Riverside, San Bernardino, and San Diego Counties to create a five county region, the number of biotechnology-related occupations is expected to increase by nearly 5% by 2020. Of the 26,720 biotechnology-related jobs in 2020, 902 (3%) are expected to be openings. The median hourly earnings for the region range from \$22.35 to \$74.86, with the overall median at \$55.87.

SOC	Description	2014 Jobs	2020 Jobs	Change	% Change	Annual Openings	Education Appropriate Openings ¹¹	Median Hourly Earnings	Regional Completions (2013)
11-9041	Architectural and Engineering Managers	3,793	3,885	92	2%	111	18	\$76.35	1,240
19-1029	Biological Scientists, All Other	613	641	28	5%	23	1	\$49.30	1,494
19-4021	Biological Technicians	1,205	1,285	80	7%	51	23	\$20.72	0
29-2033	Nuclear Medicine Technologists	112	127	15	13%	4	3	\$48.16	1,187
43-9111	Statistical Assistants	121	127	6	5%	4	3	\$23.64	313
Total		5,844	6,064	220	4%	193	48	\$60.42	

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker

5. List similar programs at other colleges in the Los Angeles and Orange County Region which may be adversely impacted.



LAOCCRC is supported by the CA Community College Chancellor’s Office and Carl D. Perkins IV grant #13-150-003.

Steven Glycer, Chair • Dr. Lynn Shaw, Vice Chair

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College	Program	Who you contacted	Outcome of contact
Fullerton College	Biological Technician	Jo Wen Wu/ Julie Wells	Positive, collaboration on Biotech program
Santiago Canyon College	Biotechnology Technician	Denise Foley	Positive, collaboration on Biotech program
Santa Ana Community College	Biotechnology Technician	Kathy Takahashi	Positive, collaboration on Biotech program

6. Include other information you would like to share.

Based on industry advice, this certificate/A.S degree program is designed to enable students to have the option to obtain a certificate of proficiency as a lab assistant, gain employment, then continue their education while working in industry. As students continue on in the program they will learn more advanced skills which can bring opportunities for advancement in the workplace. Upon completion of the program students will have obtained proficiency in basic and more advanced laboratory skills, and will have been exposed to various aspects of the industry through school-sponsored events and coursework. By having a coordinated collaboration between various colleges in Orange County, students will benefit by having multiple opportunities to seek additional specializations within the field of biotechnology. Additionally, they will obtain real-life experience through internship opportunities. This certificate meets the needs of the emerging and growing biotechnology sector in Orange County.



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