



Solano Community College District

PROTOCOL AND POLICY ON THE ACCREDITATION OF BACCALAUREATE DEGREES

Baccalaureate Program in Biomanufacturing

Submitted by:

Solano College
4000 Suisun Valley Road
Fairfield, CA 94534

Submitted to:

Accrediting Commission for Community and Junior Colleges,
Western Association of Schools and Colleges
Submission Date: September 15, 2017

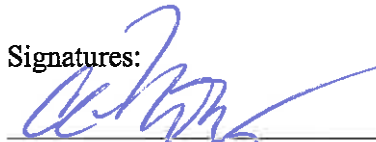
Baccalaureate Protocol Certification Page

To: Accrediting Commission for Community and Junior Colleges,
Western Association of Schools and Colleges

From: Celia Esposito-Noy, Ed.D.
President/Superintendent
Solano Community College District
4000 Suisun Valley Road
Fairfield, CA 94534

I certify there was broad participation by the campus community and believe this report accurately reflects the nature and substance of this institution.

Signatures:

 Date: 9-15-17

Celia Esposito-Noy, Ed.D.
Superintendent/President

 Date: 9-15-17

Rosemary Thurston
President, Board of Trustees

Eligibility Requirements

1. Authority: *The institution is authorized or licensed to operate as a post-secondary educational institution and to award degrees by an appropriate governmental organization or agency as required by each of the jurisdictions or regions in which it operates.*

Private institutions, if required by the appropriate statutory regulatory body, must submit evidence of authorization, licensure, or approval by that body. If incorporated, the institution shall submit a copy of its articles of incorporation.

Specified Baccalaureate Degree Program Evaluation Criteria:

- Authority requires that an institution be authorized or licensed as a post-secondary institution to award degrees. An institution wishing to gain approval for a baccalaureate degree will have to provide evidence of the institution's authorization to offer the degree, as required by each of the jurisdictions or regions in which it operates.

College: Provide a description and supporting documentation demonstrating how the College meets this Eligibility Requirement and the associated criterion.

Timeline of Events *(these documents will be available at the time of the visit)*

| | |
|--|--------------------|
| SB 850 – Signed by Governor Edmund Brown Jr. | September 28, 2014 |
| First application | December 19, 2014 |
| Second application | April 16, 2015 |
| Supplemental application | May 5, 2015 |
| Approved by California Board of Governors | May 18, 2015 |
| Substantive change proposal first submitted | April 1, 2016 |
| Substantive change proposal resubmitted | September 1, 2016 |
| Substantive change approved by ACCJC | November 21, 2016 |
| Upper division classes begin | August 2017 |
| First graduating class completes the degree | May 2019 |

The Solano Community College District (SCCD) offers a Bachelor of Science Degree in Biomanufacturing program starting in Fall 2017. The first graduating class will complete the degree in May 2019.

In fall 2014, Senate Bill 850 (Block) authorized the California Community College Chancellor's Office to select 15 colleges to pilot a Bachelor's degree for the first time in California history. The legislation specified that the subject of the Bachelor's degree would not overlap with existing programs in the California State University (CSU) or the University of California (UC) systems and that the community colleges would offer programs to meet unmet workforce needs. Additionally, colleges in the pilot program must demonstrate the resources, expertise, and student interest to offer a successful program.

In December 2014, Solano Community College (SCC) applied to become one of the first fifteen

colleges to offer a Bachelor's degree. In that first round, as announced in January 2015, SCC was not selected to participate. Later, three of the first fifteen colleges selected were withdrawn from this initial consideration and the Chancellor's Office reopened the application. Solano Community College reapplied along with thirteen other colleges for the open spots. In May 2015, the California Community College Board of Governors approved SCC's application. SCC then immediately began planning for the Bachelor's degree [[Board of Governors Approval Letter](#)]

SCC submitted a substantive change proposal to the Accrediting Commission for Community and Junior Colleges (ACCJC) to accomplish the dual goals of meeting a regional need and enhancing its mission. The ACCJC granted this substantive change in a letter dated November 21, 2016. [[Substantive Change Letter](#)]

The substantive change together with the vote by the California Community College Board of Governors authorizes SCC to offer a baccalaureate program that builds upon the existing Industrial Biotechnology Associate in Science degree. This 60-unit degree requires the completion of either the Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education (CSU-GE) lower division pattern. The baccalaureate program adds ten (10) upper division classes in the major, adds three (3) upper division General Education classes from disciplines outside of the major, and adds four electives for a total of 120 units.

These assembled efforts have produced a program design that has given the faculty, administrators, staff, and the Board of Trustees of Solano Community College confidence that it contains the quality and rigor to comply with accepted standards of a Bachelor's degree. Reviews by faculty of other colleges and subject matter experts have confirmed that it does. [[Biotech Advisory Meetings & Outreach](#)]

Accreditation Standards

The Accreditation Standards listed below apply to the institution as a whole and to each baccalaureate program. As appropriate, the list includes criteria indicating how the Standards specifically apply to baccalaureate programs. In addressing the standards, the institution must also address and provide evidence of its practices for the baccalaureate program-specific evaluation criteria identified below.

MISSION

Standard I.A. Mission:

Standard I.A.1, *The mission describes the institution's broad educational purposes, its intended student population, the types of degrees and other credentials it offers, and its commitment to student learning and student achievement. (ER 6)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Baccalaureate degrees generally extend beyond previously identified credentials, service areas, and intended student populations. Member institutions may need to make changes within the institutional mission to reflect these differences.
- The baccalaureate degree program must align with the Institutional mission.
- Student demand for the baccalaureate degree should demonstrate its correlation with the institutional mission.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The Solano Community College Mission statement clearly describes the institution's educational purposes and programs, its intended student population, and its commitment to student learning and achievement. The Mission statement provides the foundation for SCC's academic and student support programs and for all of its institutional goals.

SCC periodically evaluates its mission statement and revises it as necessary. As of June 2016, the mission statement was:

“Solano Community College’s mission is to educate a culturally and academically diverse student population drawn from our local communities and beyond. We are committed to helping our students achieve their educational, professional, and personal goals centered in basic skills education, workforce development and training, and transfer-level education. The College accomplishes this three-fold mission through its dedicated teaching, innovative programs, broad curricula, and services that are responsive to the complex needs of all students.” (Revised Board Policy 1003, approved December 19, 2012)

California Senate Bill 850 requires that community colleges offering bachelor's degrees “shall have the additional mission to provide high quality undergraduate education at an affordable price for students and the state.”

After being awarded the ability to offer the baccalaureate, the College revised the mission statement to reflect that change, specifically replacing “transfer-level education” with “undergraduate education.” Prior to approval, the revised mission statement was vetted by the campus community, including representative participatory governance bodies, per SCCD Board Policy 2005. The revised mission statement was reviewed and approved by the Academic Senate, Associated Students, College Governance Counsel, the Dean’s Committee, and the SCCD Board Subcommittee on Policies and Procedures Subcommittee.

The Board of Trustees approved the revision at their June 15, 2016 meeting:

“Solano Community College’s mission is to educate a culturally and academically diverse student population drawn from our local communities and beyond. We are committed to helping our students achieve their educational, professional, and personal goals. Solano transforms students’ lives with undergraduate education, transfer courses, career-and-technical education, certificate programs, workforce development and training, basic-skills education, and lifelong-learning opportunities.” (Revised Board Policy 1003, approved June 15, 2016)

[[Board of Trustees Minutes 6-15-16](#)]

[[BP 1003 District Mission](#)]

[[BP 2005 2005 Shared Governance](#)]

The baccalaureate degree generally extends beyond previously identified credentials, service areas, and intended student populations. The baccalaureate degree in Biomanufacturing is aligned with Solano Community College’s mission as an institution that provides both academic and career technical education by building upon the existing program in biotechnology which offers a certificate and an associate’s degree. The field of Biomanufacturing draws upon many academic disciplines including molecular and cellular biology, but it also requires technical knowledge gained from the fields of engineering and business.

Discipline faculty have reviewed and revised extensively the Learning Outcomes to better reflect the depth and rigor of each course. SCC biotechnology faculty have also created outcomes for the proposed program, called Program Learning Outcomes (PLOs). Faculty designed the Course Outlines of Record, the Student Learning Outcomes, and all class activities and exercises explicitly to meet identified criteria of upper division curriculum, including appropriate reference to higher levels of Bloom’s Taxonomy and the highest level of Webb’s Depth of Knowledge. For Bloom’s Taxonomy, the categories “Create” and, where appropriate, “Evaluate” were the target for each class. For Webb’s Depth of Knowledge, the target remained “Depth of Knowledge 4: Extended Thinking.” The learning outcomes for each course (SLOs), as well as the baccalaureate program (PLOs), now more accurately reflect the depth and rigor as specified in the SCC curriculum approval process for upper division curriculum, including the corresponding highest levels of Bloom’s taxonomy.

Where additional outcomes reference lower levels of Bloom’s taxonomy, these courses also prepare graduates for a certification test from a professional organization, to better position the student for placement in the workforce and to assess relevant aspects of the course for how it co-aligns with industry requirements.

SCC's degree program will allow students who complete the local associate's degree or equivalent course work from other colleges to earn a baccalaureate degree, which will better prepare them for positions in the biotechnology industry. A baccalaureate degree allows a greater versatility in application for positions and for enhanced upward mobility once hired.

The baccalaureate degree in Biomanufacturing supports regional workforce and economic development efforts. The College received a letter from the Solano Economic Development Corporation in support of its application to be part of the State pilot program. [[Letter from EDC](#)] The biotechnology industry in the San Francisco Bay area remains strong, is experiencing an increase in workforce demand, and will generate career placement opportunities for these graduates (employment potential is addressed later in this document). SCC's degree will allow local and regional students to enter this field with greater expertise and career preparation.

The baccalaureate degree program aligns with the Institutional mission. Evidence of this is the baccalaureate degree's alignment with Solano Community College's institutional goals. The SCCD Educational Master Plan (EMP) was revised in May 2012, and in that document, the goals were aligned with the District Strategic Plan goals. [[EMP](#); [EMP Web Page](#)] The EMP serves as the key planning document for the College. To prepare these documents, the College engaged in cross-constituency dialog and used extensive research carried out by College staff and consultants. Excerpts from the College's webpage highlight the alignment of SCC's strategic plan, objectives and educational program goals with its stated mission and the projected offering of the baccalaureate degree in Biomanufacturing.

From the SCCD Webpage

"The Solano College Strategic Plan is a collection of projects that will be completed in the next 3 years organized by SCC's Strategic Goals and Objectives. Strategic Goals and Objectives are a breakdown of the Mission, Vision, and Values. While the Mission, Vision, and Values are almost intangible, broad statements, the strategic goals and objectives attempt to add a little substance and demonstrable action to those statements. This intermediate makes it much easier for individual departments to view the work they are completing as part of a wider mission of the District."

District Strategic Goals and Objectives

Goal 1, Foster Excellence in Learning

Obj. 1.1, Create an environment that is conducive to student learning.

Obj. 1.2, Create an environment that supports quality teaching.

Obj. 1.3, Optimize student performance on Institutional Core Competencies

Goal 2, Maximize Student Access & Success

Obj. 2.1, Identify and provide appropriate support for underprepared students.

Obj. 2.2, Update and strengthen career/technical curricula.

Obj. 2.3, Identify and provide appropriate support for transfer students.

Obj. 2.4, Improve student access to college facilities and services for students.

Obj. 2.5, Develop and implement an effective Enrollment Management Plan

Goal 3, Strengthen Community Connections

Obj. 3.1, Respond to community needs.

Obj. 3.2, Expand ties to the community.

Goal 4, Optimize Resources

Obj. 4.1, Develop and manage resources to support institutional effectiveness.

Obj. 4.2, Maximize organizational efficiency and effectiveness.

Obj. 4.3, Maintain up-to-date technology to support the curriculum and business functions.

Educational Master Plan Goals

The following Educational Plan goals establish an overarching structure for SCCD:

Educational program development

Goal A: Align program offerings, policies and communications with transfer goals.

Goal B: Develop workforce-ready career/technical graduates.

Goal C: Improve basic skills of all students.

Goal D: Reduce gaps in achievement.

Goal E: Create a district-wide policy framework for program development and management.

Goal F: Improve student access to courses and services.

Goal G: Engage as a partner in community efforts.

Goal H: Connect students to the Campus community.

Goal I: Build alternative funding and revenue sources.

Goal J: Optimize existing campus and centers.

Student demand for the baccalaureate degree demonstrates its correlation with the institutional mission. Expanding the existing Industrial Biotechnology program with the baccalaureate degree in Biomanufacturing furthers both the College's and the program's ability to support many of these goals and objectives, especially those related to developing workforce-ready graduates, engaging as a community partner, and supporting quality teaching and student learning. This program will provide courses perfectly aligned to build upon the community college lower division offerings. The design of this program has been specifically tailored to develop workforce-ready graduates with the breadth and depth of upper division general education and required technical expertise. The program enhances the community by generating a trained workforce that supports one of the most important industries locally, regionally, and nationally. The educated workforce serves as a tool used by economic development agencies to attract and retain biotechnology companies.

The Educational Master Plan included the following analysis specifically targeting biotechnology, the existing lower-division program:

Program Name: Biotechnology

Strategies:

- * *Expand course offerings to meet industry trends and needs (training for maintenance workers, stem cells, biofuel production, synthetic life, etc.)*
- * *Examine the demand for workers and the potential for developing course offerings in imaging (electron microscopy, atomic force microscopy)*
- * *Diversify course delivery modes (online courses, short-term specialty courses, accelerated courses or accelerated program)*

- * *Introduce a Contract Research Organization into the program – this generates in-house internships and adds an entrepreneurship training component to the biotech program*
- * *Add a basic skills introductory component to the program (modeled on the highly successful Bridge to Biotechnology)*
- * *Continue and expand workforce training partnerships with local high schools*
- * *Increase recruitment strategies for discharged veterans*
- * *Increase recruitment of disenfranchised populations using a program like CCSF's Bridge to Biotechnology*
- * *Outreach to students from fields with comparable prerequisite requirements like nursing or water/wastewater*
- * *Develop new instructional tools like computer simulations*
- * *Prepare for a dramatic expansion of the program by planning for additional facilities like the planned Biomanufacturing training facility on the Vacaville campus*
- * *Increase the web presence of the program*
- * *Explore founding a company incubator that could use biotechnology program equipment and facilities, generate some revenue, and use students as interns*

Rationale:

General growth in enrollment and FTES, low competition from other educational providers, and projected industry growth in the county and greater Bay Area and Sacramento regions suggest the potential for program expansion. Providing a short-term program component to "fast track" students who have a degree could increase interest in the program and respond to the need for trained workers. The delivery of short courses could be designed to meet the particular needs of job seekers. Expansion in emerging areas like synthetic biology, biofuels, stem cell science, and imaging (used in nanotechnology) would lead to career possibilities for program graduates. A dedicated training facility on the Vacaville campus would increase the capacity for training students and would dramatically increase the potential to strengthen the partnership with the nearby biotech companies Genentech and Novartis. The introduction of a Bridge to Biotech (basic skills) program would expand the outreach of the program to economically disadvantaged populations within our county. The strategy of providing in-house internships and entrepreneurial training using a Contract Research Organization has been used successfully in other parts of the country and would increase the workforce readiness of our students.

These goals are also supported by the new facilities being built by Solano Community College in Vacaville as laid out in the College's Facilities Master Plan (FMP). The Facilities Master Plan [[FMP](#); [FMP Web Page](#)] was revised and adopted by the Board of Trustees in May 2014. This plan's growth goals are supported by the \$348 million Measure Q bond approved by Solano County voters in 2012. [[Measure Q & G Audit Reports](#)] The first building completed is the Biotechnology/Science building on the Vacaville campus, one of SCC's educational centers. This building (with several million dollars of new biotechnology equipment) was completed in time for the Fall 2017 semester, which coincided with the first offerings of the upper division course curricula in Biomanufacturing.

The construction of the state-of-the-art Biotechnology/Science building is a testament to the College's investment in the program and will help fulfill SCC's mission. These programmatic

and facility commitments reflect the College's ongoing pledge to change students' lives and to help them develop the workforce knowledge and skills that they need to enter this high-demand, high-growth, high-wage field that provides opportunities for upward mobility. While SCC fulfills its mission and pursues its vision to transform students' lives, these visible and tangible actions provide the foundation for those graduates to help transform the lives of their families and positively impact their communities.

Standard I.A.2: *The institution uses data to determine how effectively it is accomplishing its mission, and whether the mission directs institutional priorities in meeting the educational needs of students.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The assessment of data, in addition to measuring institution effectiveness, must also demonstrate the effectiveness and success of the baccalaureate program.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College has an Office of Research, Planning, and Institutional Effectiveness that provides data to faculty members and administrators to measure a program's effectiveness. Since the baccalaureate program accepted its first student cohort in Fall 2017, we have no student data to report. We have, however, developed Program Level Outcomes and Student Learning Outcomes and assessment assignments for the program and for each course. These have been explicitly submitted to the ACCJC in our substantive change application submitted September 1, 2016, and their analysis played a role in its approval. [[Substantive Change Proposal](#)]

Additionally, we communicate a clear process by which these outcomes will be regularly assessed to assure on-going, high quality, and effective upper division curriculum and instruction. Faculty will conduct formative, summative, and cumulative assessments in each class during the first year to evaluate the progress of each student and guide instruction. Moreover, at the end of each academic year, faculty will review the results with the industry advisory committee. These assessments and continuous feedback from industry experts and students will allow faculty to reevaluate the structure of each new course. Program Level Outcomes will be evaluated during the students' Senior Year; thus, these outcomes will be assessed in the second year of the pilot and every year thereafter. These reviews of SLOs and PLOs will inform the process of making changes in the curriculum and in the pedagogy and will become an integral part of the continuous improvement process of the program.

The Curriculum Committee plays a critical role in approving all course outlines, student learning outcomes, and in approval of the overall program. All members of the Curriculum Committee have been trained in how to apply the regulations from the California Code of Regulations (Title 5), the California Education Code, and the Commission Standards to assure the compliance and overall integrity of every program including this one. [[Solano College Curriculum Handbook](#)] Breadth, depth, sequencing, delivery mode and rigor are evaluated by the committee during its review process. The Curriculum Committee is also well-versed in the College's policies and procedures. Under the direction of the Academic Senate, and with the guidance of the Bachelor's Degree Advisory Committee, the Curriculum Committee has agreed to set aside meetings, or add extra meeting time, during the latter half of the current semester to review courses for the Bachelor's degree.

Program faculty will depend upon the expertise of the Biotechnology Advisory Committee during the design and subsequent review of the program after it launches. The faculty will

depend upon rigorous assessment of the program's outcomes to ensure that the quality of the curriculum will continue to meet industry standards. Student Learning Outcomes are embedded within the culture of the College. These outcomes will be assessed every semester and the results of these assessments will be used to refine the curriculum. SLOs and their assessment are linked to planning and resource allocation and are used for continuous quality improvement. All of these activities are analytically linked during the Program Review Process that will occur every two years. The College's Program Review Handbook has been updated to include relevant sections and references to the baccalaureate program in Biomanufacturing. [[Solano College Program Review Handbook](#)] By following established processes and procedures, the Bachelor's degree in Biomanufacturing can be refined and improved under a continuous improvement strategy.

Standard I.A.3: *The institution's programs and services are aligned with its mission. The mission guides institutional decision-making, planning, and resource allocation and informs institutional goals for student learning and achievement.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The baccalaureate program is clearly aligned with the institutional mission.
- The institution has included the baccalaureate degree in its decision making and planning processes, and in setting its goals for student learning and achievement.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The baccalaureate program is clearly aligned with the institutional mission. Solano Community College is committed to offering academic opportunities in fields of study consistent with its mission and to providing the highest possible educational quality in all of its programs and courses. The design of each course and program relies on subject matter experts on the faculty and those serving on the industry advisory committee for that discipline. When possible, the courses and the program are aligned with competencies based on nationally recognized standards. All course or program additions, deletions, or modifications must be reviewed and approved in accordance with academic standards by the discipline faculty, the Dean of the School in which the program resides, the Curriculum Committee of the Academic Senate, the Vice President of Academic Affairs, and ultimately the Board of Trustees which includes the Superintendent-President.

SCC has included the baccalaureate degree in its decision making and planning processes, and in setting its goals for student learning and achievement. The proposed baccalaureate in Biomanufacturing program emerged from the College's planning process and goal setting, and it will extend the academic quality of the existing biotechnology program and assist SCC in meeting student and community needs. Leveraging the human, facility and fiscal resources of the College's current program to create an undergraduate degree option and new career opportunities for students represents the enactment and accomplishment of the College's mission.

To implement the program, SCC formed several committees to plan for this Bachelor's degree. Planning committees include the Biomanufacturing Bachelor's Degree Implementation Advisory Committee and the following subgroups:

- Curriculum Development and Approval Subcommittee
- Accreditation Substantive Change Subcommittee
- Admission, Counseling, and Student Services Subcommittee

In addition, the committees worked closely with Academic Senate, with the Curriculum Committee (a subcommittee of Academic Senate), with the College Governance Council (formerly called the Shared Governance Council), and with the Management Team (Deans, Vice Presidents, and the Superintendent-President).

Now that the curriculum has been developed, the accreditation substantive change has been

filed and approved, and the student admissions process designed and implemented, the subgroups have been disbanded. The baccalaureate program will now be integrated into the regular planning processes of the College.

Also, the College has been participating in statewide discussions (including a monthly conference call and several in-person summits) organized by the California Community College Chancellor's Office. A major part of the statewide discussion has focused on the development of standards to assure that courses labeled upper division have been designed to contain true upper division rigor.

ASSURING ACADEMIC QUALITY AND INSTITUTIONAL EFFECTIVENESS

Standard I.B.2 *The institution defines and assesses student learning outcomes for all instructional programs and student and learning support services. (ER 11)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Student learning outcomes for upper division baccalaureate courses reflect higher levels of depth and rigor generally expected in higher education.
- Assessment must be accurate and distinguish the baccalaureate degree outcomes from those of other programs.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

As part of the curriculum development and subsequent curriculum review processes, faculty have developed SLOs for the College's active courses, including online courses. The SLOs are included in the course syllabus and are listed in the Course Outline of Record (accessible via CurricUNET). Assessments of student achievement of SLOs are integrated into regular classroom assessments (e.g., items on examinations, projects, homework assignments, laboratory reports, and papers).

Student learning outcomes for upper division baccalaureate courses reflect higher levels of depth and rigor generally expected in higher education. Student learning outcomes and their assessments have been developed and are being implemented in the first semester of the program. For example, the following student learning outcome for *BIOT 401: Biomanufacturing Process Sciences and Engineering Principles* exemplifies the higher level rigor of upper division courses through its emphasis on the application of prior knowledge and the critical thinking necessary to design a complex process:

Student Learning Outcome: The student will be able to design a complete bioprocess lifecycle for a number of cell-based production systems. Develop a process to evaluate mass transfer within a bioreactor and develop a process control strategy to improve mass transfer

Assessment Method: Students will be required to describe requirements and parameters for bioreactor and fermenter production, isolation and purification systems. Measure a bioreactor's k_La (the volumetric mass transfer coefficient) to design a strategy to match the agitation and aeration demand from the bioprocess. [[BIOT 401 Course Outline of Record](#)]

In one of the non-science required courses created for this baccalaureate degree, *ENGL 400: Technical Writing*, the SLOs again reflect this higher level of rigor through a higher word count, layered assignments, and integration of various forms of communication:

Student Learning Outcome: As a result of this class, the student will be able to compose a manual or technical report project (3,000-4,500 words) that includes a sequence of

assignments, including the effective integration of visual and document design.

Assessment Method: For example, a manual project might require a problem definition, proposal, technical definition and description, instructions, usability test and test report, and manual draft. Or, a technical report project might include a feasibility report, causal analysis, or comparative analysis, which might include problem definition, research proposal, management plan (if collaborative), progress reports, report draft, and presentation. [[ENGL 400 Course Outline of Record](#)]

Assessment of these SLOs will be accurate and will distinguish the baccalaureate degree outcomes from those of other programs. Solano Community College assures its academic quality and overall institutional effectiveness through its ongoing and collegial dialog concerning student learning and achievement. The College collects, evaluates, and broadly discusses student outcomes data and organizational performance benchmarks to inform planning and program review processes and to identify opportunities for institutional and student achievement improvements. Sustained discussion occurs in governance groups and College committees, with evidence of student learning and success provided as the basis for objective evaluation and indicators of possible programmatic and services enhancements to support emerging needs and enhanced outcomes. Because this is so well-established at the College, integrating discussions of the baccalaureate program will be seamless.

As an example, the College's current biotechnology program (Associate Degree) has well-established SLOs, and faculty members recently conducted a data-informed program review and will review the program again in the 2019-2020 academic year. [[Biotechnology Program Review](#) ; [Biotechnology Program Review Data](#) ; [Biotechnology SLOs](#)] In accordance with college educational standards, the proposed Biomanufacturing program and its courses have defined student learning outcomes appropriate for upper division courses. Utilizing Bloom's Taxonomy indicators reflecting higher level thinking, these identified outcomes will be assessed in Fall 2017, the first semester of the program's upper division offerings, and will continue to be assessed on a regular cycle throughout implementation and continued offering of the program.

Metrics and evidence, such as SLO achievement, delivery modes, enrollments, and program type, are then collected for review and assessment, and where appropriate, disaggregated for analysis of effectiveness and identification of performance gaps (goal vs. actual) for students and for the College. Results of departmental and College wide discussion and evaluation are communicated broadly to ensure awareness and shared understanding of institutional progress and needed work and also published in College updates, program reviews, and posted on the College website. Strategies to address identified gaps are then researched, discussed for efficacy and feasibility, and implemented with appropriate College support and resources.

Solano Community College demonstrates its effectiveness in its collection of evidence of student learning and success, using SLOs and other metrics to gauge how well learning and achievement are occurring, and making changes in a well-defined and coordinated continuous improvement process. In addition, SCC participates in the Institutional Effectiveness Partnership Initiative (IEPI) efforts to improve academic quality, student success, and institutional effectiveness. Finally, the demonstrated rigor of the coursework and SLOs for the

baccalaureate courses ensures that these courses are equipping students with the knowledge and skills necessary to compete in industry after graduation.

Standard I.B.3: *The institution establishes institution-set standards for student achievement, appropriate to its mission, assesses how well it is achieving them in pursuit of continuous improvement, and publishes this information. (ER 11)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The Institution has institution-set standards for the baccalaureate program and assesses performance related to those standards. It uses this assessment to improve the quality of the baccalaureate program.
- Student Achievement standards are separately identified and assessed for baccalaureate programs to distinguish them from associate degree programs.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College has institution-set standards for the baccalaureate program and will assess performance related to those standards. SCC will use this assessment to improve the quality of the baccalaureate program. The College began to develop institution-set standards in fall 2015, prior to the implementation of the baccalaureate program, but these same standards will apply. The Vice President of Academic Affairs led the process in coordination with the Institutional Research and Planning Office, initially soliciting input from the impacted constituent groups. As a result of the process, the College determined that, for each rubric, the mathematical midpoint between the mean and the lowest achievement rates in the previous five years would serve as the minimal standard for student achievement. These standards were vetted with the academic deans and approved by the Academic Senate prior to approval by the Board of Trustees. [[SCC Governing Board Minutes & Attachments 10-21-15](#)]

The College has continued to review and refine the institutions-set standards each year and to add new standards with local relevance. [[ISS](#)] This table identifies the College's institution-set standards:

| Solano Community College Institution-Set Standards | |
|---|-----|
| Successful Course Completion | 67% |
| Degrees Awarded (by Headcount) | 718 |
| Certificates Awarded (by Headcount) | 180 |
| Transfer to 4-Year Institution | 819 |
| Licensure Pass Rate | 75% |
| Job Placement Rate | 67% |

Student achievement standards are separately identified and will be separately assessed for the baccalaureate program to distinguish it from associate degree programs. As noted previously, no assessment data yet exists.

Standard I.B.7: *The institution regularly evaluates its policies and practices across all areas of the institution, including instructional programs, student and learning support services, resource management, and governance processes to assure their effectiveness in supporting academic quality and accomplishment of mission.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The institutional evaluation policies and practices recognize the unique aspects and requirements of the baccalaureate program in relation to learning and student support services and resource allocation and management.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College's evaluation policies and practices recognize the unique aspects and requirements of the baccalaureate program in relation to learning and student support services and resource allocation and management. The College regularly evaluates its policies and practices to assure their effectiveness in supporting academic quality. To achieve ongoing evaluation, the College relies on strategic and systematic communication and cooperation among the administration, faculty, classified staff, and students. All areas of the College community are represented on the College's various committees.

In accordance with Board Policy 1050, the Board of Trustees evaluates and revises its policies on a regular basis. [[BP 1050 Policy and Administrative Procedure](#)] With the implementation of the baccalaureate program, the College created two new policies:

- **Board Policy 6200B: Graduation Requirement for Baccalaureate Degree.** This policy, adopted by the Board of Trustees on April 19, 2017, sets the degree-applicable units for the baccalaureate degree at 120 units. Additionally, the policy sets the achievement standard in upper division coursework at no less than a "C." [[BP 6200B Graduation Requirement for BA Degree](#)]
- **Board Policy 6205B: Philosophy and Criteria for Baccalaureate Degree and General Education.** This policy, adopted by the Board of Trustees on April 19, 2017, describes the philosophy of the baccalaureate degree as representing "more than an accumulation of units." Instead, "It is to symbolize a successful attempt on the part of the College to lead students through patterns of learning experiences designed to develop progressively higher level capabilities and insights." [[BP 6205B Philosophy & Criteria for BA Degree](#)]

Students enrolled in the baccalaureate program are eligible for the same learning and student support services as lower division students. The baccalaureate program, likewise, participates in resource allocation along with other College programs.

INSTITUTIONAL INTEGRITY

Standard I.C.1: *The institution assures the clarity, accuracy, and integrity of information provided to students and prospective students, personnel, and all persons or organizations related to its mission statement, learning outcomes, educational programs, and student support services. The institution gives accurate information to students and the public about its accreditation status with all of its accreditors. (ER 20)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Information related to baccalaureate programs are clear and accurate in all aspects of this Standard, especially in regard to learning outcomes, program requirements, and student support services.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Information related to baccalaureate programs is clear and accurate, especially in regard to learning outcomes, program requirements, and student support services. Solano Community College has committed itself to operate with integrity in all policies, actions, and communication with the public. SCC demonstrates this commitment in its clarity and accuracy of information provided to students, prospective students, and other interested individuals and organizations concerning the College's mission, goals and outcomes, and accreditation status. The SCC catalog is updated by the Curriculum Office and published electronically every year, with an addendum published electronically at mid-year points, and serves as the most complete source of information about the College's courses and programs, degrees and certificates, academic credit, student support services, required fees, and major policies and procedures affecting students. All information included in the catalog is also available on the College website and is reviewed and revised annually to ensure accuracy. Pertinent information on the baccalaureate program in Biomanufacturing is published in the fall 2017 catalog and on the website to ensure prospective students understand admissions, course requirements, and expected learning outcomes.

The College's 2017-2018 catalog contains, for the first time, a section devoted to the new baccalaureate program. [[Biomanufacturing Degree Program Description in Catalog 2017-2018](#)] This section of the catalog explains that SCC was selected as a pilot college for a four-year degree and describes the field of Biomanufacturing and the kind of work that graduates will engage in. Like all other College programs, the catalog contains a Program Description, an explanation of the type of degree offered (Bachelor of Science), the lower- and upper-division units required for completion, and the grades necessary for successful completion of the program. The catalog also lists the Program Learning Outcomes, requirements for entry into the program, and the required courses. This section of the catalog also contains a complete course listing with course descriptions, unit hours, course prerequisites, and teaching modalities (for example, lecture and/or lab).

Because the baccalaureate degree requires entrance requirements beyond those expected of entering freshmen, the catalog contains a complete description of the eligibility and application requirements. Unfortunately, the catalog information did not include the additional per-unit fee

of \$84 required of baccalaureate enrollments, an oversight that will be corrected in the November 2017 catalog addendum, on the College website, and in subsequent catalogs.

The College catalog, as well as the College website, contains accurate information about student support services, all of which are available to students in the baccalaureate program as well as to traditional community college students. [[Student Services Catalog Information 2017-2018](#)] In addition to counselor support for the creation of a Student Education Plan (SEP), students accepted into the baccalaureate cohort participate in a “Biomanufacturing Admitted Student Information Session” prior to the start of the fall semester. [[Information Session Agenda](#)]

Standard I.C.3: *The institution uses documented assessment of student learning and evaluation of student achievement to communicate matters of academic quality to appropriate constituencies, including current and prospective students and the public. (ER 19)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The assessment results of student learning and student achievement in the baccalaureate programs are used in the communication of academic quality.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College is committed to use the assessment results of student learning outcomes to communicate academic quality. While the initial student cohort is still in its first semester of course work and thus no assessment results are available, a significant amount of work has been devoted to the creation of detailed SLOs and PLOs.

Assessments of outcomes for the baccalaureate program will adhere to established practice of the Science Department at SCC: a course is considered successful at meeting assessed outcomes if seventy percent or greater of the students achieve the SLO. Faculty use discipline-specific rubrics to evaluate each SLO, including predetermined standards of achievement. [[SLO Quality Assessment Rubric](#) ; [[Sample Rubric](#)] Low success rates (especially if below 70%) trigger a major reevaluation of the course and pedagogical approaches and a substantial change in a specified component or multiple components of the course. The 70% threshold meets standards used within the California State University for upper division outcomes assessment, including CSU Northridge. All assessments will inform to some degree approaches to course design, from changes to the establishment of local best practices, as outcomes assessment is an essential tool for continuous improvement.

Quality Assurance and Quality Control principles and methods have been woven into the design of every course in the major; several courses focus specifically on these methods. Students apply Six Sigma concepts and tools to Biomanufacturing processes. Students can engage in meta-learning by joining with the faculty in applying the DMAIC phases (design, measure, analyze, improve, and control) to the course and program.

Standard I.C.4: *The institution describes its certificates and degrees in terms of their purpose, content, course requirements, and expected learning outcomes.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The purpose, content, course requirements and learning outcomes of the baccalaureate programs are clearly described.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The Solano Community College Biomanufacturing baccalaureate degree has been included in the 2017-2018 catalog where the program, its purpose, content, course requirements and learning outcomes are clearly described. [[Biomanufacturing Degree Program Description in Catalog 2017-2018](#) ; [Biomanufacturing Degree Program Web Page](#)]

The purpose is described in the program description: “The Bachelor of Science in Biomanufacturing program builds upon the Associate in Science in Industrial Biotechnology degree. In the baccalaureate program students gain knowledge in biology, chemistry, engineering, statistics, quality, regulatory affairs, and business. Students use Biomanufacturing laboratory facilities to gain process development skills. Many of the courses have been designed with curriculum that aligns with the requirements of certifications from professional organizations.” [[Biomanufacturing Degree Program Description in Catalog 2017-2018](#)] Specifically, the baccalaureate program has been designed with the purpose of building on students’ prior knowledge and experience from an associate’s degree program in preparation for employment and career advancement in the growing field of Biomanufacturing.

The catalog also lays out the content of the baccalaureate program. Not only are the required courses clearly indicated, but the entire program is organized in a recommended sequence of courses. Each semester of classes, containing from 13-16 units of coursework, is described in the catalog and on the program web page. [[Biomanufacturing Upper Division Sequence](#); [Biomanufacturing Degree Program Web Page](#)]

The course requirements, including three upper-division courses in related fields of study developed specifically for the baccalaureate program, are also included in the catalog and on the program web page. Because the program is upper-division, many of the courses have prerequisites, and consideration of required prior-knowledge informed the development of the course sequence. [[BA Course Descriptions w SLOs](#)]

The program learning outcomes are described in the catalog and on the program web page. Individual course-level student learning outcomes (SLOs) are included in the Course Outline of Record contained in the CurricUNET curriculum management system. These SLOs are not explicitly evident to public view (consistent with the College’s practice for all curriculum), but they are included in each course’s syllabus. [[Biot 407 Syllabus w SLOs](#)]

INSTRUCTIONAL PROGRAMS

Standard II.A.1: *All instructional programs, regardless of location or means of delivery, including distance education and correspondence education, are offered in fields of study consistent with the institution's mission, are appropriate to higher education, and culminate in student attainment of identified student learning outcomes, and achievement of degrees, certificates, employment, or transfer to other higher education programs. (ER 9 and ER 11)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The baccalaureate degree field of study aligns with the institutional mission.
- Student demand for the baccalaureate degree program demonstrates its correlation with the institutional mission.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The baccalaureate degree field of study aligns with the institutional mission. The baccalaureate degree in Biomanufacturing builds on the College's existing certificate and associate in science degree in industrial biotechnology. Once in the industry, a worker with a Bachelor's degree enjoys a greater potential for upward mobility and higher income. In a very real sense, this supports the institution's mission to "[transform] students' lives with undergraduate education[.]"

Student demand for the baccalaureate degree program demonstrates its correlation with the institutional mission, since the mission clearly states SCC's commitment to "career-and-technical education [and] workforce development." As described in SCC's Substantive Change report of September 9, 2016, in which the College proposed adding the baccalaureate degree in Biomanufacturing, the future availability of jobs in the biotechnology sector in the San Francisco Bay Area, specifically in Biomanufacturing, is well-documented. A study completed by the East Bay Biomedical Manufacturing Network highlights the persistence and strength of this sector in the Bay Area including projected strong job growth, suggesting that the industry will generate 1,000 new jobs in the next two years alone, with growth expected to continue beyond that timeframe. [[Substantive Change Report Biomanufacturing pgs 37-39](#) ; [Substantive Change Report Biomanufacturing](#)] California is projected to have continued demand in the biosciences.

A 2014 study by the California Community Colleges Centers of Excellent for Labor Market Research (CCCCE) states that "the life sciences/biotechnology sector has demonstrated that it is a strong and steady job generator, growing jobs over the past decade at a pace well above the national average. It also has fared much better than the overall economy through the recent U.S. recession and into the first few years of the recovery. A primary reason for the resiliency of biotechnology is the diverse set of markets it serves. These markets span biomedical drugs; diagnostics and devices; agricultural products from animal health to seeds and crop protection; and bio-based industrial products such as enzymes for industry chemical processes and bio-remediation, bio-fuels, and bio-plastics." [[COE Report October 2014](#); [COE Report August 2014, p. 9](#); [COE Report June 2017](#)]

The projected starting hourly wage for students completing the baccalaureate is \$22.72. Experienced workers advancing into management have the potential of earning an hourly wage of \$59.08, which is well above the median living wage for the region of \$43.73. Student interest and industry support in this effort are high, and the demand to generate a workforce in this area supported the establishment of this degree. [[Workforce Trends California Life Sciences Institute Web Page](#)]

Standard II.A.3: *The institution identifies and regularly assesses learning outcomes for courses, programs, certificates and degrees using established institutional procedures. The institution has officially approved and current course outlines that include student learning outcomes. In every class section students receive a course syllabus that includes learning outcomes from the institution's officially approved course outline.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Learning outcomes for baccalaureate courses, programs, and degrees are identified and assessed consistent with institutional processes.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Learning outcomes for baccalaureate courses, programs, and degrees have been identified and will be assessed consistent with institutional processes. Solano Community College has made significant strides toward establishing a "culture of assessment" through institutional procedures developed by the Assessment Committee and the Academic Program Review Committee, both sub-committees of the Academic Senate.

Student Learning Outcomes have been created for the upper division courses of the baccalaureate degree. The process for creating these followed the same process as for all other courses at the College, except that the College's curriculum management system, CurricUNET, does not accommodate or store upper division courses or programs. Thus, while the same process was followed, documentation for the curricular work on the baccalaureate degree is stored separately. Student learning outcomes are detailed in each course outline of record.

Course level outcomes are mapped to Program Level Outcomes (PLOs), ensuring that students successfully completing all courses in the program will satisfy the PLOs as well. In the lower division coursework of the College, program learning outcomes are scheduled for comprehensive assessment during year four of the six-year assessment cycle and are also reported in the Academic Program Review. [[Academic Program Review Template](#); [Six-Year Assessment Schedule](#); [Program Review Web Page](#)] However, because the baccalaureate degree is designed as a two-year cohort program, program level outcomes will be assessed during the spring semester of the senior year in classes that serve as the capstone courses of each track.

The approved program learning outcomes for the baccalaureate degree are as follows:

Program Learning Outcomes

A. Biomanufacturing Technology:

1. Students will demonstrate the ability to identify and critically analyze two viable options for a Biomanufacturing process. The critical analysis will include the technical, financial, and environmental impact of the two options as well as the identification of the benefits and disadvantages of each.

2. Students will be able to produce a professional report and presentation representing their opinion regarding the advantages of selecting a specific Biomanufacturing process

B. Quality:

3. Students will demonstrate the skills needed to conduct an investigation and analysis of an Out of Specification deviation that occurred during a production step in the manufacturing of a pharmaceutical protein. The student will be able to determine the impact of the OOS deviation on the batch of protein.
4. Students will be able to produce a written Corrective Action Preventative Action report in a format standard to the industry. The report will include evidence to justify their conclusions and action plan.
5. Student will demonstrate the ability to apply Quality by Design (QbD) principles (understanding of the product, the process, and the process control) as adopted by the U.S. Food and Drug Administration (FDA) to design a robust, stable, and controlled manufacturing process for a protein pharmaceutical that can be carried out under current Good Manufacturing Practices (cGMPs). This includes the ability to predetermine values and potential ranges of the critical quality attributes (CQAs) of the product and the critical material attributes (CMAs) of the materials. Students will also be able to determine which parameters would benefit from a Design of Experiments (DoE) approach for their optimization, and construct a strategy for experimental planning and data analysis.
6. Students will use a quality risk assessment approach to perform a criticality assessment to determine the Critical Process Parameters (CPPs) that would need to be monitored and controlled.

The three upper division general education courses, *ENGL 400: Technical Writing*, *PHIL 400: Bioethics*, and *BUS 400: Project Management*, support and have been mapped to the program level outcomes as well as the Solano Community College general education learning outcomes and institutional learning outcomes. Students will complete ENGL 400, the Technical writing course, in their first semester, and the writing and research skills that they learn in that course will be applicable in every other upper division course and can be applied to the projects that constitute the Program Level Outcomes. The Business course, Project Management, will teach knowledge and organizational skills that students will be able to apply to the projects that constitute the PLOs. This course also requires students to consider global regulations, which further fits with the College's institution learning outcomes. The bioethics course will reinforce the critical thinking skills taught in the lower division required prerequisite courses and will further develop students' speaking abilities that will be required to complete PLOs.

Standard II.A.5: *The institution's degrees and programs follow practices common to American higher education, including appropriate length, breadth, depth, rigor, course sequencing, time to completion, and synthesis of learning. The institution ensures that minimum degree requirements are 60 semester credits or equivalent at the associate level, and 120 credits or equivalent at the baccalaureate level. (ER 12)*

- A Minimum of 40 semester credits or equivalent of total upper division coursework including the major and general education is required.
- The academic credit awarded for upper division courses within baccalaureate programs is clearly distinguished from that of lower division courses.
- The instructional level and curriculum of the upper division courses in the baccalaureate degree are comparable to those commonly accepted among like degrees in higher education and reflect the higher levels of knowledge and intellectual inquiry expected at the baccalaureate level.
- Student expectations, including learning outcomes, assignments and examinations of the upper division courses demonstrate the rigor commonly accepted among like degrees in higher education.
- The program length and delivery mode of instruction are appropriate for the expected level of rigor.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

- ***A Minimum of 40 semester credits or equivalent of total upper division coursework including the major and general education is required:*** The program requires 39 units of upper division coursework in the major and 9 units of upper division coursework in General Education courses for a total of 48 units completed in upper division coursework.
- ***The academic credit awarded for upper division courses within baccalaureate programs is clearly distinguished from that of lower division courses:*** The Solano Community College Academic Senate developed a new process to analyze the rigor of upper division courses for approval. Upper Division courses are given a “400 level” designation to make them clearly distinguishable from lower division courses.
- ***The instructional level and curriculum of the upper division courses in the baccalaureate degree are comparable to those commonly accepted among like degrees in higher education and reflect the higher levels of knowledge and intellectual inquiry expected at the baccalaureate level:*** During the approval process the Academic Senate developed an Upper Division Course Work form that analyzed each course for its depth/focus, specialization, refinement, required preparation, and for its status as a capstone course or its requirement for students to create projects that integrate knowledge from previous courses. For each approved course, the faculty, administrators, curriculum committee, and the Board of Trustees concluded that the course reflected the level of knowledge and the quality of intellectual inquiry appropriate for an upper division course.

- ***Student expectations, including learning outcomes, assignments and examinations of the upper division courses demonstrate the rigor commonly accepted among like degrees in higher education:*** The assessments in each upper division course have been designed to demand that students use higher levels of Bloom’s Taxonomy and the highest level of Webb’s Depth of Knowledge. The assessments of all of the Program Level Outcomes and the Student Learning Outcomes have been designed to incorporate projects utilize higher levels of Bloom’s taxonomy and the highest level of Webb’s Depth of Knowledge.
- ***The program length and delivery mode of instruction are appropriate for the expected level of rigor:*** The program incorporates rigorous courses that demand upper level thinking and analysis, integration, and the incorporation of prior knowledge obtained in lower division courses. Some of these courses require extensive laboratory equipment that utilizes state-of-the-art equipment.

Solano Community College adopted additional approval processes, on March 7, 2016, to assure sufficient depth and rigor of upper division curriculum. SCC’s Academic Senate, in collaboration with its Curriculum Committee and the Office of Academic Affairs, developed its process for local approval of upper division coursework to satisfy requirements and recommendations as set forward by the Academic Senate of California Community Colleges (ASCCC), the California Community College Chancellor’s Office (CCCCO), as well as the requirements of ACCJC.

SCC’s local process is informed by statewide discussions within the ASCCC as well as dialogues between the fifteen (15) pilot colleges. Prior to the creation of an approval process, the SCC Academic Senate, on November 11, 2015, adopted the recommendations of the CCCCCO Bachelor Degree Program Taskforce in Resolution 11.16.2015.2: “Endorse ASCCC Resolutions 9.02 (F 15), 9.03 (F 15), 9.04 (F 15), 9.05 (F 15) and 9.06 (F 15) for the Development of the Bachelor of Science degree in Bio-Manufacturing.

[[SCC Senate Resolution 11.16.2015.2: “Endorse ASCCC Resolutions 9.02 \(F 15\), 9.03 \(F 15\), 9.04 \(F 15\), 9.05 \(F 15\) and 9.06 \(F 15\) for the Development of the Bachelor of Science degree in Bio-Manufacturing](#) ; [Academic Senate Minutes 11-16-15](#) ; [Academic Senate Minutes 11-14-16](#) ; [Academic Senate Minutes 3-7-16](#) ; [Curriculum Handbook Web Page](#) ; [Curriculum Handbook 2017-2018](#)]

This endorsement of ASCCC positions included the local adoption of the definition of upper division to inform subsequent development of a local curricular approval process for the approval of upper division curriculum:

Upper division courses are defined as requiring lower division knowledge and applying that knowledge as demonstrated measures of critical thinking through writing, oral communication, or computation. Upper division coursework may also encompass research elements, workforce training, apprenticeships, internships, required practicum, or capstone projects. Upper division courses typically will have one or more lower division or upper division prerequisites that have been established using content review of the entry skills necessary to be successful as outlined in the California Code of Regulations (CCR), title 5, section 55003. Courses that have been designated as upper division are only applicable to baccalaureate degrees and may not be used to satisfy associate degree requirements.

The rigor of each upper division course has been evaluated by the SCC Curriculum Committee during the approval process and found to be of sufficient rigor to be considered upper division. For each course, the supplementary form examined the course for its depth/focus, specialization, refinement, preparation, and capstone elements. This section applies an analysis of the same elements to the baccalaureate program:

1. **Depth/Focus:** student outcomes include the development and understanding of the theories and methods of the discipline which may include the applications and limitations of those theories.

Each and every course in the program requires a depth that requires the students to apply the knowledge and skills that they gained in their lower division courses. This prior knowledge is essential for success in the upper division course. Each course takes a subject that was introduced as a small part of the lower division program, focuses upon it, and expands the discussion to a full semester by covering the subject in detail.

2. **Specialization:** student outcomes include specific intellectual and professional abilities to enable success or progress in a particular field or professional practice.

Each course covers a very specialized subject. Again, the course takes a subject that was introduced in the lower division program and covers it as a specialty using advanced discussions of equipment, facilities, engineering principles, and business strategies and approaches.

3. **Refinement:** students are able to build upon the “general education” background noted above the application of these skills in more discerning or challenging contexts.

Each course takes what the students learned in lower division in the context of a lower level Bloom’s taxonomy (just learning and understanding the information) and then challenges them with an activity (a project or assignment) that demands higher level Bloom’s taxonomy; the students are required to create an idea, or critically evaluate someone else’s idea.

4. **Preparation:** prerequisites may include more general courses, student class standing, GPA requirements, or admission to a pre-professional program.

Without the knowledge of the biotechnology industry, its technologies and quality approaches, acquired in the lower division program, students would certainly fail. This applies to each course.

5. **Capstone Courses/Projects:** though not necessarily specialized or focused on in-depth study of one discipline, student outcomes may have an integrative function wherein students integrate knowledge from earlier studies. Moreover, upper-division course-level outcomes in capstone courses may correspond to program-level outcomes.

Taken together, it is the opinion of the faculty of this program and of the members of the Curriculum Committee who reviewed and approved the courses that each course contains the rigor to be called “upper division.”

Standard II.A.6: *The institution schedules courses in a manner that allows students to complete certificate and degree programs within a period of time consistent with established expectations in higher education.*¹ (ER 9)

Specified Baccalaureate Degree Program Evaluation Criteria:

- Baccalaureate courses are scheduled to ensure that students will complete those programs in a reasonable period of time.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Baccalaureate courses are scheduled to ensure that students will complete the program in a reasonable period of time – in this case, four semesters or two years. The baccalaureate program has been designed to enroll students that have already completed 60 units and to add 60 more units in a two-year period. The students go through the program as a cohort. This timing is consistent with accepted higher education standards and represents a reasonable amount of time, given the rigor of the upper division courses.

| | | |
|---------------------------------|--|---|
| Lower Division | Biotechnology associates degree or equivalent preparation | |
| Upper Division, Year One | Fall Term <ul style="list-style-type: none"> • Biomanufacturing Process Sciences and Engineering Principles-BIOT401 (5 Units) • Advanced Topics in Quality Assurance and Regulatory Affairs BIOT407 (4 Units) • Upper division GE Technical Writing ENG 400 (3 Units) • Elective (3 Units) | Spring Term <ul style="list-style-type: none"> • Design of Biomanufacturing Facilities, Critical Utilities, Processes and Equipment BIOT403 (4 Units) • Bioprocess Monitoring and Control BIOT404 (5 Units) • Design of Experiments for Biomanufacturing BIOT402 (4 Units) • Elective (3 Units) |
| Upper Division, Year Two | Fall Term <ul style="list-style-type: none"> • Supply Chain and Enterprise Resource Planning BIOT 406 (3 Units) • Emerging Biomanufacturing Technologies BIOT405 (3 Units) • Six Sigma and Lean Manufacturing BIOT408 (4 Units) • Upper division GE Bioethics PHIL 400 (3 Units) • Electives (3 Units) | Spring Term <ul style="list-style-type: none"> • Methods in Quality Improvements, Investigations and Audits BIOT409 (4 Units) • Emerging Trends in Biomanufacturing Quality BIOT410 (3 Units) • Upper division GE Project Management BUS400 (3 Units) • Elective (3 Units) |

A career path is clearly defined, as demonstrated in the table on the next page:

Solano College Biomanufacturing Pathways

SCORE

(Solano College Outreach and Research and Education)

Potential AS and Baccalaureate Students

Articulated High Schools
with Biotechnology
Programs

Bridge to Biosciences

Solano College Science
Students

Solano College AS
Industrial Biotechnology

Graduates of Intensive
bootcamps (IBIS)

Incumbent
biomanufacturing workers
seeking a four year
degree

Other Community
Colleges with AS
programs in
Biotechnology (CCSF,
Ohlone, Laney, and
Contra Costa)

Solano College Baccalaureate Degree in Biomanufacturing

Standard II.A.9: *The institution awards course credit, degrees and certificates based on student attainment of learning outcomes. Units of credit awarded are consistent with institutional policies that reflect generally accepted norms or equivalencies in higher education. If the institution offers courses based on clock hours, it follows Federal standards for clock-to-credit-hour conversions. (ER 10)*

[†]Glossary- Established expectations in higher education (also, appropriate for, accepted in, common to, accepted norms in, etc): Shared and time honored principles, values and practices within the American community of higher education.

Specified Baccalaureate Degree Program Evaluation Criteria:

- Baccalaureate Degrees and the course credit in those programs are based on student learning outcomes. These outcomes are consistent with generally accepted norms and equivalencies in higher education, especially in relation to upper division courses.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The baccalaureate degree and the course credit in the program is based on student learning outcomes. These outcomes are consistent with generally accepted norms and equivalencies in higher education, especially in relation to upper division courses. Solano Community College uses the Carnegie System of Units to determine units of credit to be awarded for each course, whether upper or lower division. The College also follows the California Community Colleges Chancellor's Office "Standard Formula for Credit Hour Calculations." [[CCCCO Formula for Unit Value Calculations](#)] In this system of unit calculation, for example, students earn 3 units for a 3 hour per week lecture course and 1 unit for a 3 hour per week laboratory course. These are the nationally adopted standards.

Standard II.A.10: *The institution makes available to its students clearly stated transfer-of-credit policies in order to facilitate the mobility of students without penalty. In accepting transfer credits to fulfill degree requirements, the institution certifies that the expected learning outcomes for transferred courses are comparable to the learning outcomes of its own courses. Where patterns of student enrollment between institutions are identified, the institution develops articulation agreements as appropriate to its mission. (ER 10)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Policies for student transfer into the baccalaureate program ensure that all program requirements are fulfilled, including completion of the minimum required semester units, prerequisites, experiential activities, and general education.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Policies for student transfer into the baccalaureate program ensure that all program requirements are fulfilled, including completion of the minimum required semester units, prerequisites, experiential activities, and general education. Solano Community College faculty have carried out extensive work to assure that students from other biotechnology programs in California and from other parts of the United States could transfer into the upper division program.

Community college biotechnology programs find themselves in a unique position – every biotechnology program at every technical and community college are tied together through a national network called Bio-Link funded by the National Science Foundation for the last nineteen years. There has been a comparable network in California established even longer ago that encouraged regional hubs as well as a statewide network funded through the California Community College Chancellor’s Office; Solano Community College once hosted the Northern California Biotechnology Center. Through these networks faculty in the discipline carry out continual conversations on content, curriculum, outcomes, and assessments. These conversations have led to a de facto national alignment of curriculum.

In addition there has been quite a lot of work carried out to develop national skill standards. The most recent effort was recently completed. A Department of Labor grant funded the Community College Consortium for Bioscience Credentials that developed skill standards in four areas: Core Skill Standards for Bioscience Technicians, Skills Standards for Medical Devices, Skill Standards for the Biotechnology Laboratory, and Skill Standards for Biomanufacturing. All of the standards were written with extensive input from industry. The availability of these standards has gone a long way toward standardizing lower division curriculum and enabling the transfer of courses from one institution to another.

In addition, the state of California has developed a Course Identification Number, the C-ID system, and recently included biotechnology courses as part of this system. The C-ID system was developed specifically to make it easier for courses to transfer between a community college and the California State University system and between community colleges. The

Solano Community College courses have been aligned to this system; other colleges that also align will easily transfer credit for a prerequisite course. The General Education prerequisite courses have also been aligned:

| | |
|--|----------|
| Lower Division | |
| CSU General Education pattern or IGETC GE pattern | 39 units |
| Lower Division Major Units: <ul style="list-style-type: none"> • Chemistry 1 – General Chemistry 1 (C-ID Chem 110) • Biological Sciences 2 – Cell/Molecular Biology (C-ID Bio 190) • Mathematics 11 – Statistics or Biostatistics (C-ID Math 110) • Business and Regulatory Principles of Biotechnology (C-ID Biot 210) • Principles of Biotechnology (C-ID Biot 150BX) • Cell Culture and Protein Recovery (C-ID Biot 220BX + 230BX) • Quality Control and Genetic Engineering (C-ID Biot 150BX) | 28 units |
| Upper Division Majors Program: 3-5 Units Each <ul style="list-style-type: none"> • Biomanufacturing Process Sciences and Engineering Principles (BIOT 401) • Design of Experiments for Biomanufacturing (BIOT 402) • Design of Biomanufacturing Facilities, Critical Utilities, Processes, and Equipment (BIOT 403) • Bioprocess Monitoring and Control (BIOT 404) • Emerging Biomanufacturing Technologies (Seminar) (BIOT 405) • Supply Chain and Enterprise Resource Planning in Biomanufacturing (BIOT 406) • Advanced Topics in Quality Assurance and Regulatory Affairs (BIOT 407) • Six Sigma and Lean Manufacturing (BIOT 408) • Methods in Quality Improvements, Investigations, and Audits (BIOT 409) • Emerging Trends in Biomanufacturing Quality (Seminar) (BIOT 410) | 39 units |
| Upper Division General Education <ul style="list-style-type: none"> • Advanced Technical Writing: Writing for the Sciences (ENGL 400) • Project Management (BUS 400) • Bioethics (PHIL 400) | 9 units |
| Electives | 12 units |

The design of the program utilizes the two commonly used General Education patterns, the CSU or the IGETC patterns, to explicitly make the transfer of General Education courses easier.

For upper division course transfer, there is a unique situation since these courses and this program exists only at a single college in the United States: our partner college MiraCosta College. This situation is not a coincidence; the legislation that authorized California

Community Colleges to offer Bachelor's degrees requires that the degrees be offered in fields that were not offered at any University of California campus or any California State University college.

Certainly a student who wanted to switch from MiraCosta College to Solano Community College could easily transfer those units. The courses and the programs have been written together with extensive interactions among faculty.

The California Community College Academic Senate carries out a continuous conversation with our colleagues in the California State University system and the University of California system through their Academic Senates and their subcommittees. Currently there will be no transfer of upper division courses between any of the 15 community colleges with a baccalaureate program and CSU. The University of California representatives expressed a sentiment that they would consider reviewing courses on an individual basis for transfer. Other colleges with baccalaureate programs have carried out conversations with private colleges and report a similar potential there.

The Biomanufacturing program includes elements in its design to make it easier for students from other colleges to continue their education and transfer into the upper division program in a way that allows them to seamlessly apply all of their units. Transfer as an upper division student will remain a challenge due to provisions in the legislation that authorized California Community Colleges to offer Bachelor's degrees.

Standard II.A.11: *The institution includes in all of its programs, student learning outcomes, appropriate to the program level, in communication competency, information competency, quantitative competency, analytic inquiry skills, ethical reasoning, the ability to engage diverse perspectives, and other program-specific learning outcomes.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Student learning outcomes in baccalaureate programs are consistent with generally accepted norms in higher education and reflect the higher levels expected at the baccalaureate level.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Student learning outcomes in the baccalaureate program in Biomanufacturing are consistent with generally accepted norms in higher education and reflect the higher levels expected at the baccalaureate level. The Student Learning Outcomes and the Program Level Outcomes were submitted to the ACCJC as part of the substantive change proposal. These SLOs and PLOs were designed with extensive input from multiple faculty, from our assessment coordinator, from the academic senate, from the Curriculum Committee, from industry advisors, and from our partners at MiraCosta College who also launched a Biomanufacturing baccalaureate degree program. We submit that these are consistent with accepted norms in higher education.

Again, the SLOs and PLOs have been designed to demand higher levels of Bloom's Taxonomy and the highest level of Webb's Depth of Knowledge. Each PLO and almost every SLO requires a project that demands an integration of knowledge from different disciplines, a synthesis of disparate ideas, and an application to a practical problem. We believe that these represent SLOs and PLOs appropriate for an upper division level.

Standard II.A.12: *The institution requires of all of its degree programs a component of general education based on a carefully considered philosophy for both associate and baccalaureate degrees that is clearly stated in its catalog. The institution, relying on faculty expertise, determines the appropriateness of each course for inclusion in the general education curriculum, based upon student learning outcomes and competencies appropriate to the degree level. The learning outcomes include a student's preparation for and acceptance of responsible participation in civil society, skills for lifelong learning and application of learning, and a broad comprehension of the development of knowledge, practice, and interpretive approaches in the arts and humanities, the sciences, mathematics, and social sciences. (ER 12)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- At least 36 semester units or equivalent of lower and upper division general education is required, including at least 9 semester units or equivalent of upper division general education coursework.
- At least 9 semester units or equivalent of upper division general education coursework is required.
- The general education requirements are integrated and distributed to both lower division and upper division courses.
- The general education requirements are distributed across the major subject areas for general education; the distribution appropriately captures the baccalaureate level student learning outcomes and competencies.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The Biomanufacturing baccalaureate meets or exceeds this standard.

- At least 36 semester units or equivalent of lower and upper division general education is required – The program requires 48 units of upper division work
- At least 9 semester units or equivalent of upper division general education coursework is required. – the program requires 9 semester units of upper division general education
- The general education requirements are integrated and distributed to both lower division and upper division courses – lower division requires the completion of either the IGETC or the CSU general education pattern. Upper division general education requires the completion of 3 courses across diverse disciplines.
- The general education requirements are distributed across the major subject areas for general education; the distribution appropriately captures the baccalaureate level student learning outcomes and competencies.

Standard II.A.13: *All degree programs include focused study in at least one area of inquiry or in an established interdisciplinary core. The identification of specialized courses in an area of inquiry or interdisciplinary core is based upon student learning outcomes and competencies, and include mastery, at the appropriate degree level, of key theories and practices within the field of study.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The baccalaureate degree programs include a focused study on one area of inquiry or discipline at the baccalaureate level and include key theories and practices appropriate to the baccalaureate degree level.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The Biomanufacturing baccalaureate degree focuses on Biomanufacturing, a single specialty. This specialty integrates and incorporates knowledge from a variety of disciplines including biology, chemistry, physics, and engineering. Of course, all of these disciplines require students to be adept at mathematics. The Biomanufacturing baccalaureate especially incorporates statistics in many of its classes. The laboratory courses in the baccalaureate program cover process development which includes practices solely covered in upper division classes.

Standard II.A.14: *Graduates completing career-technical certificates and degrees demonstrate technical and professional competencies that meet employment standards and other applicable standards and preparation for external licensure and certification*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The CTE baccalaureate degree ensures students will be able to meet employment standards and licensure or certification as required in the field of study.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The Biomanufacturing discipline does not have formal licenses or certification. However, many of the professional organizations within the field offer professional certifications typically requiring students to fulfill particular requirements (a two year degree, for example) and then to sit for exams to earn these professional certifications.

The upper division coursework in Biomanufacturing is not primarily designed to teach to industry certifications. Instead, aspects of the upper division curriculum and the professional certification exams emphasize knowledge required to be successful in the field. It is a test of relevance of our program that subjects covered by professional certifications are a subset of the upper division curriculum. Too, it is in the interest of the student to make this correlation for purposes of industry compatibility and career placement and advancement, key criteria of the bachelor pilot degrees.

This incorporation of industry standards into academic curriculum design is not uncommon in the sciences at SCC and elsewhere. For example, this approach is also used in the design of two- and four-year college chemistry courses: the American Chemical Society (ACS) recommends key curricular elements for organic and inorganic chemistry to universities and colleges, including CSU and UC. Local scores on exams linked to this recommended curriculum are therefore also assessments of the effectiveness of curriculum and pedagogy as it relates to articulation and transfer as well as degree conferral. Likewise, acknowledging external standards provides additional, important assessment data on the curriculum and pedagogical design of the course, as well as contributing to the credibility of the curriculum for the external, professional community.

The certifications that Biomanufacturing baccalaureate students would be eligible to pursue are elite certifications in the field and would contribute positively to a graduate's qualifications, employability and mobility when coupled with a Bachelor of Science degree. Indeed, within the discipline of Biomanufacturing, it is very desirable to earn quality certifications, as they indicate rigorous training, education and/or work experience to the industry. Current eligibility for these exams is determined through appropriate background consisting of education and/or work experience. For example, the prerequisites for the American Society for Quality's Quality Improvement Associate is the conferral of an Associate's or its equivalent. Other certification exams require even more: the Project Management Professional Certification from the Project Management Institute requires either an Associate's degree and 7,500 hours of project management experience or a Bachelor's degree and 4,500 hours of project management experience. The degree of rigor required to earn these certifications is the reason that the

certifications have earned the respect that they are given in the industry. The Bachelor of Science in Biomanufacturing would provide readiness for the following certification exams:

| Certification | Level | Professional Organization | Examination | Prerequisite or Requirement |
|------------------------|----------------------|----------------------------------|---------------------------------------|--|
| CPIM Supply Chain | | APICS | Proctored, in person 5 cert. exams | 2 years exp. recommended |
| Six Sigma | Yellow or Green Belt | IASSC or ASQ | Proctored, in person, 3 hour exam | ASQ GB requires project and 3 years exp. |
| Lean Manufacturing | Bronze | AME | In person or Online exam | Portfolio of work |
| CQIA Quality Associate | | AQS | In person, proctored, 3 hour exam | Associates Degree or equivalent |
| PMP | | PMI | 4 hour proctored exam | AS + 7,500 hrs or BS +4,500 hrs |

AQS: American Society for Quality

APCS: American Production and Inventory Control Society

AME: Association for Manufacturing Excellence

IASSC: International Association for Six Sigma Certification

PMI: Project Management Institute

Finally, this aspect of student readiness is particularly compelling to our industry partners. Not only are our advisors from industry enthusiastic about the approach, but the linkage between portions of our upper division curriculum and industry standards gains us tremendous credibility contributing to program success when defined not only through completion but also career placement and advancement, a core element of the bachelor degree pilot.

The proposed upper division curriculum for the Bachelor of Science in Biomanufacturing is much more than preparation for industry tests and certifications. The ability of graduates to sit for exams and earn one or more of these certifications dramatically improves their professional standing, their prospects to be hired, and their upward mobility. At the same time, the prospect of graduates earning these certifications gains the baccalaureate degree increased credibility and enhances the meaning of the degree to the professional community. The inclusion of industry standards contributes to the overall success of the proposed program, especially when combined with the other elements of the curriculum and our approval processes, thereby assuring sufficient depth, rigor and currency, hallmarks of upper division curriculum.

LIBRARY AND LEARNING SUPPORT SERVICES

Standard II.B.1: *The institution supports student learning and achievement by providing library and other learning support services to students and to personnel responsible for student learning and support. These services are sufficient in quantity, currency, depth, and variety to support educational programs, regardless of location or means of delivery, including distance education and correspondence education. Learning support services include, but are not limited to, library collections, tutoring, learning centers, computer laboratories, learning technology, and ongoing instruction for users of library and other learning support services.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Learning support services to support the baccalaureate program are sufficient to support the quality, currency, rigor and depth of the baccalaureate degree and reflect the unique needs of this program.

- Resource collections are sufficient in regard to the rigor, currency, and depth expected of baccalaureate programs.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College is committed to providing information and learning support services for all students. A significant cadre of faculty and staff provide technology, library and learning resources, and academic support to students who are enrolled in SCC programs. Solano College supports student learning and achievement by providing library and student support services of sufficient quality, depth and variety to meet student needs and foster the achievement of their educational goals. The College's resources in support of student learning regardless of location or delivery mode, include libraries, book and materials collections, tutoring and academic success centers, computer labs and learning technology in classrooms and campus study settings. Solano relies on the expertise of faculty and support services personnel to identify and regularly evaluate educational materials and equipment that support student achievement. Any proposal for a new course or a new program, including the proposed baccalaureate program in Biomanufacturing, is reviewed for sufficient library resources and sufficient learning support services as an integral part of the curriculum review process.

The College's Technology Services and Support department is responsible for the district-wide administration of technology including installation, upgrades, security, and user-support. The Technology Services and Support staff help Solano Community College students, faculty and staff communicate, retrieve, and utilize information. They handle the planning, operation and maintenance of the SCCD's technology infrastructure, administrative computing facilities, academic computer labs, smart classrooms, helpdesk, technology training, and the district-wide telephone system. These technology resources will be available to the faculty, staff and students in the Biomanufacturing program.

Similarly, the Solano Community College Library supports the students, faculty and staff across

the SCC district with an extensive collection of library resources. Solano College students have access to the primary Library at the main campus, which includes a repository of books, periodicals, and electronic databases, as well as the recently expanded Library Services at the Vacaville and Vallejo Centers. The library on the main campus has an especially rich collection of titles in Biomanufacturing, biotechnology, cell biology, molecular biology, and immunology and the College plans to enhance its library collection of titles related to Biomanufacturing [[Books List](#)] and house the majority of the new resources at the Vacaville Center where the Biomanufacturing program will be located. Additional library and learning resources have been identified, and new resources will continue to be identified through the College's normal curriculum development and review process where faculty can complete a "Resource Request Form" for specific titles and materials.

Academic support services include resources such as the Academic Success and Tutoring Center, the Math Activities Lab, the Reading and Writing Labs, Science labs, Student Computer labs, the Mathematics, Engineering, and the Science Achievement (MESA) Center. Biomanufacturing students will be able utilize these learning support services at SCC and at the College's Vacaville Center, where students have ready access to a variety of student learning services, as well as services provided online.

SCC will continue to meet its commitment as well as the Eligibility Requirement for Information and Learning Support Services for all its students including those enrolled in the Biomanufacturing baccalaureate program.

Library

The Solano Community College Library on the main campus offers book collections and online databases and the full-time Library Services available at the Vallejo and Vacaville Centers provide instructional support to all students. The SCC biotechnology faculty have worked closely with the library staff for decades to assure that the book and journal offerings in this field are robust and remain up-to-date. The faculty submit book requests and the majority of books and related resource materials are ultimately ordered and catalogued for students' access and use. Library databases currently include at least 725 books and 256 journals (via subscription) covering cell and molecular biology, immunology, biotechnology, and Biomanufacturing. [[SCC Library Databases](#); [SCC Library Special Collections](#)]

The Library's Biotechnology and Biomanufacturing resources will be expanded to include additional resources that specifically support upper-division biotechnology courses and the program's General Education upper division courses. These resources will continue to be identified during the formal approval of the curriculum, currently underway, and continually during delivery of the program.

Learning Support Services

SCC provides quality and accessible tutoring and learning support students to all students and encourages utilization of these support services by every student who wants or needs them. Tutoring is available for students and supports student progress and success in current courses. The College operates an Academic Success and Tutoring Center (ASTC) to provide easy access

for students to resources they may need. The ASTC is open to all SCC students, faculty, and staff and serves as a center to encourage and facilitate academic success through support services that include computer usage and free printing, a supportive and positive study environment, academic success workshops (e.g., test anxiety strategies, study skills, exam preparation, research and writing papers), information about important campus support resources, whiteboard use, drop-in tutoring for a variety of subjects, as well as providing a place for instructors to meet with students or conduct office hours. Faculty members serve as directors and primary staff of the ASTC, along with classified staff and student tutors. The current director of the ASTC anticipates that some new tutors will be needed to support specific lower-division and upper-division courses. Recruitment of appropriately qualified tutors for these courses will occur both internally and through outreach to partner Biotech companies and local universities.

STUDENT SUPPORT SERVICES

Standard II.C.6: *The institution has adopted and adheres to admission policies consistent with its mission that specify the qualifications of students appropriate for its programs. The institution defines and advises students on clear pathways² to complete degrees, certificate and transfer goals. (ER 16)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The prerequisites and other qualifications for the baccalaureate are appropriately communicated and applied to students.
- The advising of students related to the baccalaureate degree appropriately identifies course sequencing and pathways.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The prerequisites are clearly identified in the College catalog, all brochures, and every document that discusses the baccalaureate degree. The pathway is clearly defined, as evidenced by the chart on the following page. Thus, the advising of students related to the baccalaureate degree appropriately identifies course sequencing pathways. Additionally, since the program is designed as a cohort program, students do not have choices regarding which courses to take or when to take them.

Solano College Biomanufacturing Pathways

SCORE

(Solano College Outreach and Research and Education)

Potential AS and Baccalaureate Students

Articulated High Schools
with Biotechnology
Programs

Bridge to Biosciences

Solano College Science
Students

Solano College AS
Industrial Biotechnology

Graduates of intensive
bootcamps (IBIS)

Incumbent
biomanufacturing workers
seeking a four year
degree

Other Community
Colleges with AS
programs in
Biotechnology (CCSF,
Ohlone, Laney, and
Contra Costa)

Solano College Baccalaureate Degree in Biomanufacturing

HUMAN RESOURCES

Standard III.A.1: *The institution assures the integrity and quality of its programs and services by employing administrators, faculty and staff who are qualified by appropriate education, training, and experience to provide and support these programs and services. Criteria, qualifications, and procedures for selection of personnel are clearly and publicly stated and address the needs of the institution in serving its student population. Job descriptions are directly related to institutional mission and goals and accurately reflect position duties, responsibilities, and authority.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The job descriptions for faculty members teaching in the baccalaureate degree accurately reflect the duties and responsibilities associated with the position. [[Biotech Instructor JD](#)]

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College assures the integrity and quality of its programs and services by employing qualified administrators, faculty and staff. The College has formal hiring processes based on the District's Hiring Policies, including its Equal Employment Opportunity policy to assure that the College employs qualified certificated and classified employees. [[EEO Plan; EEO Web Page](#)] Position descriptions are aligned with the College's mission and include specific tasks for each position such as curriculum development and student learning assessment in faculty postings. The employment screening process includes a requirement that all candidates meet local and State of California minimum qualifications for their respective positions. Faculty and administrators meet minimum qualifications recommended by the Academic Senate for California Community Colleges and established by the California Community Colleges Board of Governors. [[Minimum Qualifications Web Page ; 2014 Minimum Qualifications Handbook ADA](#)] In addition, Solano College's Human Resources Office verifies that all degrees listed by candidates for certificated and classified positions have been earned from accredited institutions.

SCC maintains a sufficient number of qualified faculty and staff to ensure that instructional and operational responsibilities essential to the College's mission and effective administration can be handled smoothly and in a competent manner. All classified and certificated staff and administrators at SCC are evaluated on a regular basis. Faculty and staff members are evaluated based on established Board policies as negotiated through their collective bargaining agreement. [[Evaluation Forms ; Biotech Instructor JD](#)] The College has adopted and published its Code of Ethics and professional development of faculty and staff is supported through the availability of on-campus and external programs.

The Human Resources Office implements the District's Equal Employment Opportunity Program and oversees adherence to federal and state regulations. The College's Staff Equity Committee is a standing committee that developed the Staff Equity Report and continues to advise the District on how to maintain policies and procedures that support reaching the College's equal opportunity goals.

Human resource planning has been integrated with institutional planning by having the analysis performed and the evidence gathered during the program review process to inform hiring priorities. The College committed to hiring an additional full time faculty member in the application to the Chancellor's Office to pilot the bachelor's degree in Biomanufacturing, as documented in the application submitted for the pilot program.

Standard III.A.2: *Faculty qualifications include knowledge of the subject matter and requisite skills for the service to be performed. Factors of qualification include appropriate degrees, professional experience, discipline expertise, level of assignment, teaching skills, scholarly activities, and potential to contribute to the mission of the institution. Faculty job descriptions include development and review of curriculum as well as assessment of learning. (ER 14)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The qualifications for faculty teaching upper division courses in the baccalaureate degree include the requirement for a master's degree (or academic credentials at least one level higher than the baccalaureate degree) or doctoral degree, in an appropriate discipline.
- In cases where no Master's degree is available for the field of study, the qualifications for faculty teaching upper division courses in the baccalaureate degree include a bachelor's degree in the discipline or closely related discipline, and a Master's degree in any discipline, and demonstrated industry work experience in the field for a minimum of six years, and commonly required industry-recognized certification or professional licensure.
- The Commission may require some faculty in non-career technical education baccalaureate programs to have the recognized terminal degree in the field of study.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The qualifications for faculty teaching upper division courses in the baccalaureate degree include the requirement for a master's degree or doctoral degree, in an appropriate discipline. [\[Biotech Instructor JD\]](#) All of the faculty who will teach in the Biomanufacturing degree have a Master's degree or higher in biology, chemistry, or engineering. In support of offering baccalaureate degree courses, the College hired a faculty member specifically to teach the upper division courses. Dr. Gulnur Sanden was hired in May 2017, and she possesses a Ph.D. in Biomedical Engineering from University of South Florida, as well as industry experience in the biotechnology field.

According to the California Community Colleges Chancellor's Office handbook, Minimum Qualifications for Faculty and Administrators in California Community Colleges, the field of Biotechnology does not require even a Master's degree for faculty; instead, it falls in the category of disciplines requiring only a specific bachelor's or associate's degree and professional experience. Specifically, minimum qualifications for biotechnology include "Bachelor's degree in the biological sciences, chemistry, biochemistry or engineering, and two years of full-time related professional experience." (Minimum Qualifications Handbook, page 40) All of the faculty associated with Solano Community College's baccalaureate program exceed these minimum qualifications.

Standard III.A.7: *The institution maintains a sufficient number of qualified faculty, which includes full-time faculty and may include part-time and adjunct faculty, to assure the fulfillment of faculty responsibilities essential to the quality of educational programs and services to achieve institutional mission and purposes.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- There is at least one full-time faculty member assigned to the baccalaureate program.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

Solano Community College hired Dr. Gulnur Sanden in May 2017 with her primary responsibilities to continue curriculum development and to teach in the Biomanufacturing baccalaureate program. Dr. Sanden brings academic experience with a Ph.D. in Biomedical Engineering from University of South Florida and industry experience after having worked in Biomanufacturing. Three other full-time faculty members in biotechnology include Dr. Ed Re, Professor James DeKloe, and Professor Michael Silva.

PHYSICAL RESOURCES

Standard III.B.3: *To assure the feasibility and effectiveness of physical resources in supporting institutional programs and services, the institution plans and evaluates its facilities and equipment on a regular basis, taking utilization and other relevant data into account.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The facilities and other physical resources utilized by the baccalaureate program are evaluated for feasibility and effectiveness for the program on a regular basis.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The facilities and other physical resources utilized by the baccalaureate program have been evaluated for feasibility and effectiveness for the program, and regular review is planned. Solano Community College assures safe and sufficient physical resources for its educational programs and services. Facilities are constructed and maintained to provide accessible, safe and healthy learning environments for students, faculty and staff. The College operates a main campus and two centers, located in the cities of Vallejo and Vacaville. Planning for building, maintenance, and operations of these campuses is codified in the long-range Facilities Master Plan with utilization and overall cost data reviewed regularly to sustain the College's high-quality physical plant.

The main campus in Fairfield lies on 192 acres and has 28 buildings with 348,615 assignable square foot capacity. Vallejo Center, situated on 10 acres, houses various academic programs in a 28,647 square foot building. The Vacaville Center lies on 60 acres with a single 34,916 square foot building. The College owns an additional 4.32 acre site across the street which houses the Vacaville Annex, and this site has a single 16,500 square foot building. The College completed the 31,943 square foot Biotechnology/Science Building at the Vacaville Center location just in time for the beginning of fall 2017 classes and the first cohort of students into the baccalaureate program. The building houses a 4-lab Biotech suite consisting of: 1) a Cell Culture Lab; 2) Fermentation Lab (Bioreactors); 3) Proton Purification Lab; and 4) a Qualification Control/Assurance lab. The existing state-of-the-art lab on the Fairfield campus, plus the new Biotech lab suites in Vacaville, will ensure that the Biomanufacturing Baccalaureate program will have quality, state-of-the-art physical resources available for use.

[[Equipment List for new Biotechnology Facility](#) ; [Floor Plan for New Biotechnology Facility](#)]
[[BioTechnology Science Building Project Summary](#)]

TECHNOLOGY RESOURCES

Standard III.C.1: *Technology services, professional support, facilities, hardware, and software are appropriate and adequate to support the institution's management and operational functions, academic programs, teaching and learning, and support services.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- Technology services, support, facilities, hardware and software utilized by the baccalaureate program are appropriate and adequate for the program.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The College's technology services and resources are adequate to support the teaching and management functions of the institution. Technology resources for the baccalaureate program in Biomanufacturing have been identified and will be sufficient to support a quality learning experience for enrolled students.

Solano College has made a concerted effort to provide appropriate and expanded funding for the technology needs of the campuses. Bond funds are being leveraged to advance the District's technology infrastructure, particularly within specific building projects. The Board of Trustees at its August 20, 2014 meeting also approved a \$14 million technology budget. [[Solano College Bond Spending Plan](#) ; [Bond Spending Plan Web Page](#) ; [Biotechnology Science Building Project Summary](#)]

The College's Technology Plan is currently being revised, adopting a more strategic and longer-range planning approach. Early in the process, resources were used to fund the most immediate and critical needs for "updating" technology, which is now shifting to a "total cost of ownership" model, moving away from a crisis-response mode. A "refresh" program is in place, and new computers are systematically provided to newly hired faculty. Planning for other technology needs occurs through the department planning and program review processes. These planning processes, along with institutional priorities, now inform technology planning, further demonstrating the College's attention to a fully integrated planning and resource allocation system.

FINANCIAL RESOURCES

Standard III.D.1: *Financial resources are sufficient to support and sustain student learning programs and services and improve institutional effectiveness. The distribution of resources supports the development, maintenance, allocation and reallocation, and enhancement of programs and services. The institution plans and manages its financial affairs with integrity and in a manner that ensures financial stability. (ER 18)*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The financial resources allocated to the baccalaureate program are sufficient to support and sustain program student learning and effectiveness.
- Financial resources allocated to the baccalaureate program ensure the financial stability of the program.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

The District has sufficient financial resources to support and sustain student learning programs, including the proposed baccalaureate program, and to improve institutional effectiveness. Solano Community College's mission and the Board of Trustees' goals create the foundation for financial planning. Financial planning is integrated with the College's overall planning processes and provides for the appropriate distribution of resources and continued financial stability. SCC's history of solid management and fiscal leadership is culminating in an expected ending General Fund balance of 15% for 2016-2017. [[2016-17 Financial Report](#)] Thus SCCD's financial picture looks strong and is able to support quality educational programs and services and meet student and organizational needs.

Looking forward, long-range financial priorities are folded into the annual budget development process utilizing both the Five-Year Capital Outlay Plan and Scheduled Maintenance Plan for facilities-related costs and the Technology Master Plan to address technology needs. Additionally, where possible and appropriate, long term obligations were paid off via the bond, i.e. the qualified energy conservation bonds were used to build out the solar system installations at Fairfield Campus and the Vacaville and Vallejo Centers. The identified priorities were built into the bond language, which greatly alleviated operational costs.

Budget assumptions, based on the Governor's Budget, are fiscally conservative, and financial information is readily available to College constituents via the Banner system. SCCD's multi-faceted budget planning and review process culminates in the proposed budget allocations, which undergoes a final review by the Executive Committee before being submitted to the Governing Board for approval.

Revenue and expense activities are examined annually by an independent audit firm, contracted to perform the district audit as well as two bond audits: a performance and financial audit. These audits are performed annually and results of the audit reports including the institutional responses to external audit findings are accepted in an open Governing Board

session. For the last ten years, periods 2005-06 through 2014-15, the district audits, which include thorough reviews of internal controls and structure ended in clean (unqualified or unmodified) opinions, attesting to the integrity of the District's financial management practices. The annual audits are then posted on the Finance and Administration web site, where periodic financial statements, budgets and budget presentations, Measure G and Q bond audits, quarterly and annual budget and financial reports, and actuarial studies for the retiree health liability can also be found. [[Solano College Finance and Administration Web Page](#)]

DECISION-MAKING ROLES AND PROCESSES

Standard IV.A.4: *Faculty and academic administrators, through policy and procedures, and through well-defined structures, have responsibility for recommendations about curriculum and student learning programs and services.*

Specified Baccalaureate Degree Program Evaluation Criteria:

- The faculty and academic administrators assigned to the baccalaureate program have responsibility for making recommendations to appropriate governance and decision-making bodies about the curriculum, student learning programs, and services for the program.

College: Provide a description and supporting documentation demonstrating how the College meets this Standard and the associated criteria.

At Solano Community College, governance roles are identified and supported by the College's organization structure and decision-making processes. SCC follows a participatory governance model. The governance infrastructure, inclusive of all constituencies, is well-defined and will capably handle the new and added requirements and procedures needed to support and grant the bachelor's degree in Biomanufacturing.

Governance structures and processes are regularly evaluated to ensure that faculty, staff, students and administrators have access to participate in college decision processes. In November 2015, the Shared Governance Council was renamed the College Governance Council, and the Fiscal Advisory Committee was re-structured. This change reflects how the governance structure is evaluated periodically and serves as the foundation for proposed improvements based upon constituent feedback, reflection, and dialog.

The College Governance Council, chaired by the Superintendent-President, develops policy and procedural recommendations to present to constituents and to the Board of Trustees. Educational program development, degree requirements, and curriculum fall into the purview of the Academic Senate and Academic Affairs in a participatory governance model.

The Academic Senate considered the pursuit of a Bachelor's degree and voted unanimously to proceed with the proposal at its regular meeting on November 17, 2014, as documented earlier in this proposal. [[AS Minutes 11-17-14](#)] The Senate's recommendations were tendered to the Academic Deans' Council and the President's Cabinet for further consideration, and the Superintendent-President submitted the change to the Board of Trustees for action. On December 19, 2014, the College formally submitted an application to become a part of the California Baccalaureate Degree pilot to the Chancellor's Office, representing the California Community Colleges Board of Governors. [[BA Application & Proposals](#)]

The decision to site the Biomanufacturing program primarily in Vacaville came about as a result of SCCD's institutional leadership encouraging College faculty and administrators to search for an innovative solution to make the newly proposed career technical program accessible to more students. Relevant data and perspectives were shared, and the decision to

locate the program in the city of Vacaville was most desirable to all. The renovation of Room 114 in the Vacaville Center allowed early offerings at that location.

Additionally, the faculty and administrators involved in this decision exercised a substantial voice in making key recommendations and decisions. The former SCC Superintendent-President, the Dean of Mathematics and Science, the full time faculty members, and the Executive Bonds Manager together researched possible locations, assessed the viability and suitability of those locations, and worked collaboratively to make a sound recommendation about this location for the Biomanufacturing program. The Vacaville site is best suited to offer students access to industry partners, with potential internships and job opportunities.

The clarity of decision making roles and the effectiveness of the decision to site the proposed baccalaureate degree in Vacaville is an example of the distributed leadership model that Solano Community College follows in its institutional processes and will serve students well in the development and implementation of the Biomanufacturing program.

Chief Executive Officer

The Superintendent-President is the Chief Executive Officer (CEO) of the Solano Community College District. The CEO is hired by the District's Governing Board, and serves as the Secretary to the Board. The Superintendent-President is responsible for administering Governing Board policies, ensuring the overall quality of the Institution's services, providing leadership in budgeting, managing resources, and assessing institutional effectiveness. The superintendent-president also ensures that the College adheres to all applicable laws, regulations, and policies.

Because SCC is a single college district, the Superintendent-President has the sole full-time responsibility as Chief Executive Officer with the requisite authority and responsibility to assure quality of instructional programs and student and administrative services provided to students and the College community.

The previous Superintendent-President supported and encouraged the development of the baccalaureate program at every stage, and he provided regular reports to the Board of Trustees and the community about the purpose and progress of the application to participate in the pilot baccalaureate program. The new current president, Dr. Celia Esposito-Noy, has likewise expressed strong support.

The Superintendent-President continues to consult with the Administrative Leadership Group, the Academic Senate, and the College Governance Council to assure the College has appropriate staff, faculty, facilities, and budget resources available to fully support the new program.

Governing Board

The Solano Community College District Board of Trustees is an eight-member body that includes a Student Trustee. The Governing Board formulates policy, maintains institutional integrity, assures fiscal soundness, and ensures the fulfillment of the College's mission. The

seven elected members of the Board of Trustees are elected to four year, staggered terms, and each represents and resides in a specific area of the Solano Community College District. The members are elected by the registered voters of the same trustee area. The Associated Students of Solano Community College elect a Student Trustee annually to represent the student body for a one-year term. The Student Trustee gives an advisory vote on all decisions.

The Board of Trustees hires and delegates power and authority to the Superintendent-President. The Board's other duties include establishing Board policies, approving long-range academic and facilities master plans, supervising the broad policies for construction of projects under the bond Measure Q, and establishing policies for and approving courses and educational programs. Board policies and procedures for District operations are published on the College website. The Board has been informed and has supported the baccalaureate degree proposal at every stage.

Catalog Requirements

The institution assures that the Catalog provides the following information about the baccalaureate degree program:

1. General Information
 - Course Program and Degree Offerings
 - Student Learning Outcomes for Programs and Degrees
2. Requirements for
 - Degrees, Certificates, Graduation and Transfer

Institutional Response:

The college has published information about the baccalaureate degree in the most recent catalog. That catalog contains general information about the program including courses, the student learning outcomes and program level outcomes, and the requirements to completion of the degree.

[[Biomanufacturing Degree Program Description in Catalog 2017-2018](#)]

As the evidence shows, the catalog includes general information about the program and the degree, indicating that it is different from the lower division programs leading to a certificate or associates degree. The Student Learning Outcomes for the Program, or PLOs, are listed explicitly on this program description page in the catalog. [[Biomanufacturing Degree Program Outcomes](#)]

The catalog also lists the requirements for the baccalaureate degree, including a listing of the required courses, requirements for completing electives, and the grade point average necessary for successful course and program completion and, ultimately, graduation. Additionally, the catalog contains detailed information about eligibility requirements for acceptance into the program along with specific information to help students complete the application materials. The 2017-2018 catalog did not indicate the additional baccalaureate fee of \$84, but this will be included in the November addendum and subsequent catalogs.

Commission Policies

In preparing its ISER, an institution with one or more ACCJC-accredited baccalaureate degrees must, for the evaluation criteria cited in the Checklist for Evaluating Institutional Compliance with Federal Regulations and Related Commission Policies³ in the categories identified below, specifically address and provide evidence of its practices as to the baccalaureate degree and how those practices meet the criteria.

Standards and Performance with Respect to Student Achievement

Solano Community College has defined elements of student achievement performance across the institution and in the baccalaureate program. Specifically, for completion of the baccalaureate degree, a grade of “C” or better in each upper division course is required, in keeping with the higher level of rigor of the program. Additionally, the program was designed as a cohort program, and all courses are to be taken in order in the semester in which they are offered. [[Catalog Description of Biomanufacturing Degree](#)]

The defined elements of student achievement performance in the baccalaureate instructional program include job placement rates for program completers. Job placement is already an institution-set standard (67%), though because of the demand for workers and the robust employment prospects across the local geographical region, the baccalaureate program expects higher job placement rates. These data will be communicated along with other programs when reporting on institution-set standards, and, along with regular SLO and PLO assessments, will contribute to short- and long-term planning decisions.

Credits, Program Length, and Tuition

Credit hour assignments and degree program length are within the range of good practice in higher education. According to Board Policy 6200B, the degree consists of 120 degree-applicable semester units, including upper division coursework in the appropriate field of study with no grade in the Science prerequisite courses less than a “C.” No credits in the upper division courses are repeatable. SCC defines a credit hour consistent with the Chancellor’s Office Standard Formula for Credit Hour Calculations. [[Chancellor’s Office Hours and Units Calculations](#)] Under this formula, eighteen lecture hours per semester or term corresponds to one unit of course credit. Fifty-four hours per semester or term of laboratory time accounts for one unit of course credit.

The assignment of credit hours and degree program lengths is verified by the College and is reliable and accurate across classroom based courses and laboratory classes. When the baccalaureate upper division courses were created, faculty used the same credit-hour calculations as for traditional lower division courses, even if the content is advanced and of higher rigor.

There is a rational basis for the baccalaureate program-specific tuition. For

baccalaureate programs across the state, there is an additional upper division fee of \$84 per unit that the College is allowed to keep. This is above and in addition to the \$46 per unit fee that all community college students pay for tuition. The California Community Colleges Chancellor's Office resource, [Baccalaureate Degree Pilot Program Handbook](#), states on page 16: "Upper Division Coursework Fee (Ed. Code, § 78042(g)(5); Cal. Code Regs., tit. 5, § 58520: Currently \$84/unit for semester system colleges and \$56/unit for quarter system colleges are charged on all upper division courses that are part of an approved baccalaureate degree pilot program. This additional fee for upper division coursework is not required to be reported to the California Community Colleges Chancellor's Office for purposes of state apportionment offset."

[[Baccalaureate Degree Pilot Program Handbook](#)]

Transfer Policies

Transfer policies are appropriately disclosed to students and to the public. The College catalog and website both contain clearly identified sections on transfer policies. The College catalog contains information about Associate Degrees for Transfer on page 54 and includes a section entitled "Transfer to Four-Year Colleges & Universities" on the next page. This section contains bold text informing students that "Obtaining regular counselor assistance with transfer education planning is essential for successful transition to four-year universities and colleges." [[Transfer Information in Catalog 2017-2018](#) ; [SCC Catalog 2017-2018](#)]

The College website contains a link to "Transfer Center" on its Student Services page under the heading of "Success." The Transfer Center page contains a description of services and contact information plus a sidebar with helpful links to such resources as the CSU ADT, HBCU Transfer Agreement, the UC TAG, and Assist.org. [[Transfer Center Web Page](#)]

Policies contain information about the criteria the institution uses to accept credits for transfer. In the College catalog under the heading of "Graduation Requirements," a subheading called "Transfer of Credit From Other Colleges" states: "Only those courses from regionally accredited colleges may be accepted for general education and transfer to a degree or certificate program." [[Transfer Information in Catalog 2017-2018](#); [SCC Catalog 2017-2018](#)] Below that, under the subheading of "Total Units," the catalog states that "At least 12 semester units must be completed at Solano Community College." This information on transfer policies is clear and accessible to the public.

Distance Education and Correspondence Education

This program does not contain any Distance Education or Correspondence Education elements.

Institutional Disclosure and Advertising and Recruitment Materials

Solano Community College provides accurate, timely, and appropriately detailed information to students and the public about its programs, locations, and policies. The College produces a yearly print catalog that is posted in electronic form on the College homepage. [[SCC Web Page](#)] In addition to comprehensive information in the College catalog and on the website, the College produces two Class Schedules each year, one in

the later spring advertising summer and fall semester courses and one in the fall advertising spring courses. Additionally, the yearly catalog is supplemented by an Addendum in November; however, this has been produced irregularly in recent years. All printed and web materials contain addresses and contact information for educational sites.

³ See the Checklist for Evaluating Institutional Compliance with Federal Regulations and Related Commission Policies for articulation of the evaluation criteria.

List of Supporting Documents

| Baccalaureate | File/Link Name |
|----------------------|--|
| 1 | Board of Governors Approval Letter |
| | Substantive Change Letter |
| folder | Biotech Advisory Meetings & Outreach |
| IA1 | Minutes of the Academic Senate |
| | Minutes of the College Governance Counsel |
| | Board of Trustees Minutes 6-15-16 |
| | BP 1003 District Mission |
| | BP 2005 Shared Governance |
| | Letter from EDC |
| | EMP |
| folder | EMP Web Page |
| | FMP |
| folder | FMP Web Page |
| | Measure Q & G Audit Reports |
| IA2 | Substantive Change Proposal (Report) |
| | Solano College Curriculum Handbook |
| | Solano College Program Review Handbook |
| IA3 | |
| IB2 | BIOT 401 Course Outline of Record |
| | ENGL 400 Course Outline of Record |
| | Biotechnology Program Review |
| | Biotechnology Program Review Data |
| | Biotechnology SLOs |
| IB3 | |
| folder | SCC Governing Board Minutes & Attachments 10-21-15 |
| folder | ISS |

| | |
|---------------|--|
| IB7 | BP 1050 Policy and Administrative Procedure BP 6200B Graduation Requirement for BA Degree BP 6205B Philosophy & Criteria for BA Degree Biomanufacturing Degree Program Description in Catalog 2017-2018 |
| IC1 | Student Services Catalog Information 2017-2018 Information Session Agenda |
| IC3 | Sample Rubric SLO Quality Assessment Rubric |
| IC4 | Biomanufacturing Degree Program Description in Catalog 2017-2018 Biomanufacturing Degree Program Web Page Biomanufacturing Degree Program Description in Catalog 2017-2018 Biomanufacturing Upper Division Sequence Biomanufacturing Degree Program Web Page |
| folder | BA Course Descriptions w SLOs Biot 407 Syllabus w SLOs |
| IIA1 | Substantive Change Report Biomanufacturing pgs 37-39 Substantive Change Report Biomanufacturing COE Report October 2014 COE Report August 2014, p. 9 COE Report June 2017 Workforce Trends _ California Life Sciences Institute Web Page |
| IIA3 | Academic Program Review Template Six Year Assessment Cycle Program Review Web Page |
| IIA5 | Resolution ASCCC Taskforce Recs BS Degree Revised 11 16 15 Academic Ssenate Minutes 11-16-15 Academic Senate Minutes 11-14-16 Academic Senate Minutes 3-7-16 Curriculum Handbook On Web Page Curriculum Handbook 2017-2018 |
| IIA6 | |
| IIA9 | CCCCO Formula for Unit Value Calculations |
| IIA10 | |
| IIA11 | |
| IIA12 | |
| IIA13 | |
| IIA14 | |
| IIB1 | Book List SCC Library Databases Library Special Collections |

IIC6
IIIA1

Biotech Instructor JD
EEO Plan
EEO Web Page
Minimum Qualifications 2014 Web Page
2014_MQHandbook_ADA
Evaluation Forms
Biotech Instructor JD
Biotech Instructor JD

IIA2
IIIA7
IIIB3

Equipment List for New Biotechnology Facility
Floor Plan for New Biotechnology Facility
Biotechnology Science Building Project Summary
Solano College Bond Spending Plan 3-16-16
Bond Spending Plan Web Page

IIC1

Biotechnology Science Building Project Summary

IID1

2016-2017 Financial Report
Solano College Finance & Administration Web Page

IVA4

AS Minutes 11-17-14
AS Minutes

folder

BA Application & Proposals
Biomanufacturing Degree Program Description in Catalog 2017-2018
Program Learning Outcomes for Baccalaureate Degree
Catalog Description of Biomanufacturing Degree
Chancellor's Office Hours and Units Calculations
Baccalaureate Degree Pilot Program Handbook
Transfer Information in Catalog 2017-2018
SCC Catalog 2017-2018
Transfer Center Web Page
Transfer Information in Catalog 2017-2018
SCC Catalog 2017-2018
SCC Web Page