Abbreviated Form: New Certificate Programs, Minors, Emphases for Existing Programs, K-12 Endorsement Programs or Out of Service Area Delivery Program

*For DSU Internal Approval Sequence only*

Proposed or Current Program Title: Certificate in Biotechnology

Sponsoring School or Division: College of Science, Engineering, & Technology

Sponsoring Academic Department(s) or Unit(s): Department of Biological Sciences

Classification of Instructional Program Code¹: (6 digit CIP)

Credit Hours Required of Full Program: 21-29

Proposed Beginning Term²: Fall 2019

Institutional Board of Trustees’ Approval Date:

*DSU Approval Sequence: CCC, UCC/GC, AC, UC (informational only), and Board of Trustees

 Proposal Type

- Certificate of Proficiency
- Certificate of Completion
- Minor
- Graduate Certificate
- Post-Baccalaureate Certificate
- Post-Masters Certificate
- K-12 Endorsement Program
- New Emphasis in Existing Program
- Out of Service Area Delivery Program

¹ For CIP code classifications, please see https://nces.ed.gov/ipeds/cipcode/default.aspx?y=55
² “Proposed Beginning Term” refers to first term after Trustee’s approval that students may declare this program.
Abbreviated Form: New Certificate Programs, Minors, Emphases for Existing Programs, K-12 
Endorsement Programs or Out of Service Area Delivery Program 
Form for DSU Internal Approval Sequence only* 

Date: October 15, 2019

Section I: Request

Briefly describe the request. Indicate the primary activities impacted, especially focusing on any 
instructional activities. Type below:

The Certificate of Biotechnology will provide students with analytical and hands-on education in the areas of biology, 
chemistry, basic lab techniques and basic programming. Biotechnology is one of the areas for which local companies in 
southern Utah are struggling to find skilled workers. The degree will prepare students to pursue careers as biological and 
laboratory technicians at the local hospital, biotech firms, and companies that perform in-house microbiology testing of 
products. The small number of credits required by the Certificate will enable students to quickly enter the workforce. This 
unique curriculum is intentionally designed to serve as the first level of a series of stackable credentials in biology, chemistry, 
bioinformatics, or computer science that could be earned by concurrent enrollment students, traditional college students, or 
non-traditional students returning to college to complete a degree. Students who complete the Certificate will have the skills 
required for entry-level lab tech positions which are currently in high demand locally as several Washington County based 
firms have plans for substantial expansion in the next few years.

Students are required to complete 21 hours of specified coursework
- 6 credit hours of biology and biotechnology techniques
- 5 credit hours of chemistry and laboratory techniques
- 6 credit hours of computer science programming
- 4 credit hours of math

Students are also offered the opportunity to take 1-8 credits of Life Science Internship with a local Biotechnology firm although 
this is not required.

Students are required to pass all Biotechnology courses with a C or higher.

Students are required to obtain a 2.5 or greater overall DSU cumulative GPA.

Section II: Need

Indicate why such an administrative change, program, or center is justified. Reference need or demand 
studies if appropriate. Indicate the similarity of the proposed unit/program with similar units/programs 
which exist elsewhere in the state or Intermountain region. Type below:

Dr. O’Brien has been working with industry for the past 10 years and has repeatedly heard that local companies cannot fill 
their biotechnology workforce needs. At least one company based in northern Utah canceled its plan to expand in the St.
George region because of this. Entry level jobs with many local companies do not require a Bachelor's degree and would provide an excellent form of employment for students working toward more advanced degrees and provide a final degree for students looking for documentation of their college work in a short amount of time.

A Biotechnology Certificate would contribute to the efforts to help Utahns complete a college degree and lead to more stable employment opportunities than are generally available to those with some college, but no degree. The percentage of Washington County residents with some college or an Associate's degree is 40.9%

The curriculum for the Biotechnology Certificate forms the first level of a series of stackable credentials that could facilitate students earning additional degrees with the credits fulfilling some of the most time intensive General Education credits for an Associate's degree as well as many of the first-semester or first-year requirements for several different Bachelor's degrees in the College of Science and Technology.

Utah Department of Workforce Services gives the occupations of Biological Technicians a 4-start rating for having a moderate employment outlook (due to replacement needs) and high wage. In Utah, the median annual salary for Biological Technicians with a Bachelor's degree is $29,400 for inexperienced engineers and $36,620 overall. Annual job openings for a Bachelor's degree averages 30 with 2.76% annual growth rate. There are no statistics for Biological Technicians without a Bachelor’s degree but, a small group of companies in St. George estimate that they will need approximately 200 new technicians with basic lab skills in the next few years with the largest numbers needed by SoftCell Biological and DXNA as they expand. The Bureau of Labor Statistics states that, in the United States, the median annual salary is $42,520 for a Bachelor's degree with a faster than average 10% annual growth rate through 2026.

**Section III: Institutional Impact**

*Will the proposed administrative change or program affect enrollments in instructional programs of affiliated departments or programs? How will the proposed change affect existing administrative structures? If a new unit, where will it fit in the organizational structure of the institution? What changes in faculty and staff will be required? What new physical facilities or modification to existing facilities will be required? Describe the extent of the equipment commitment necessary to initiate the administrative change. If you are submitting a reinstated program, or program for off-campus delivery, respond to the previous questions as appropriate.*  Type below

The development of the Certificate has strong support from all levels of DSU administration and faculty. The program will be located within the Department of Biological Sciences in the College of Science, Engineering, and Technology. We received funding through Perkins Special Projects to cover the expense of the equipment necessary for the new genetics laboratory. We have received one-year funding from Talent Ready Utah to cover the recruitment and advisement of students in area high schools for Concurrent Enrollment courses that count towards the Certificate. We plan to seek on-going funding to continue to fund this position through the Utah Department of Workforce Services.

We will hold training sessions for General Education and TRiO advisors to make sure they are aware of the Certificate and how to help students navigate the requirements to earn the Certificate.

If the program is highly successful and increases recruitment of students to Concurrent Enrollment courses in area high schools, we will need to work with the Washington County School District to increase the number of courses available to high school students. This program may also ultimately result in an increased demand for lower division STEM courses on campus and we would request new faculty lines at that time just as we would with any type of growth.
Section IV: Finances

*What costs or savings are anticipated from this change? If new funds are required, describe in detail expected sources of funds. Describe any budgetary impact on other programs or units within the institution. Type below.*

The only new funds we would like for the three positions listed on this proposal will come from grants we are seeking through the Department of Workforce Services. There should be minimal other impacts on any programs at DSU.
Section V: Program Curriculum
***THIS SECTION OF THE TEMPLATE REQUIRED FOR EMPHASES, MINORS, AND CERTIFICATES ONLY***

All Program Courses (with New Courses in Bold)
List all courses, including new courses, to be offered in the proposed program by prefix, number, title, and credit hours (or credit equivalences). The total number of courses shown and credit hours should match the required number of credits to be awarded the degree. Use the following format.

<table>
<thead>
<tr>
<th>Course Prefix and Number</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 1610</td>
<td>Principles of Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1615</td>
<td>Principles of Biology I Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 2035</td>
<td>Genetics and Biotechnology Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 1210</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1215</td>
<td>General Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>CS 1400</td>
<td>Fundamentals of Programming</td>
<td>3</td>
</tr>
<tr>
<td>CS 1410</td>
<td>Object Oriented Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1050</td>
<td>College Algebra/Pre-Calc</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td>21</td>
</tr>
<tr>
<td>Elective Courses (optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 4890</td>
<td>Life Science Internship I</td>
<td>1-8</td>
</tr>
<tr>
<td>BIOL 4891</td>
<td>Life Science Internship II</td>
<td>1-8</td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td>1-8</td>
</tr>
<tr>
<td>Track/Options (if applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Number of Credits</td>
<td>21-29</td>
</tr>
</tbody>
</table>
Section VI: Assessment Impact

PLOs are required for all minors if the courses for the minor are not already included in a single bachelor’s degree. Describe the assessment plan for this program. Are all courses entered into CIM? Any new courses and fees must be approved in CIM prior to or at the same time this proposal goes to UCC.

Section VII: Information Needed for NWCCU Form

This section is ONLY for all new Minors or Certificates requiring 30 or more credit hours. All other program proposals do not require this section. The information below is needed to complete the Substantive Change Form required by NWCCU, which will be completed and submitted by the DSU Curriculum Office.

1. Please list the Program Learning Outcomes (PLOs) for this program.

2. Complete Section VI above relative to these PLOs.

3. List the primary faculty who will be teaching the courses for this program—list faculty by name and include highest degree and subject area. Example:
   Davy Jones, Ph.D. Marine Biology

4. Complete the budget form on the next page:
Appendix D: Projected Program Participation and Finance

Part I.  
Project the number of students who will be attracted to the proposed program as well as increased expenses, if any. Include new faculty & staff as described in Appendix C.

### Three Year Projection: Program Participation and Department Budget

<table>
<thead>
<tr>
<th></th>
<th>Year Preceding Implementation</th>
<th>New Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Year 1</td>
</tr>
<tr>
<td><strong>Student Data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Majors in Department</td>
<td>615</td>
<td>650</td>
</tr>
<tr>
<td># of Majors in Proposed Program(s)</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td># of Graduates from Department</td>
<td>41</td>
<td>48</td>
</tr>
<tr>
<td># Graduates in New Program(s)</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>

### Department Financial Data

- **EXPENSES** – nature of additional costs required for proposed program(s)
  - List salary benefits for additional faculty/staff each year the positions will be filled. For example, if hiring faculty in year 2, include expense in years 2 and 3. List one-time operating expenses only in the year expended.
  - Personnel (Faculty & Staff Salary & Benefits): $1,592,169
  - Operating Expenses (equipment, travel, resources): $247,544
  - Other:
  - **TOTAL PROGRAM EXPENSES**: $1,839,713
  - **TOTAL EXPENSES**: $2,049,713

- **FUNDING** – source of funding to cover additional costs generated by proposed program(s)
  - Internal Reallocation using Narrative 1 on the following page. Describe new sources of funding using Narrative 2.
  - Appropriation: $870,257
  - Special Legislative Appropriation: $210,000
  - Grants and Contracts: $257,427
  - Tuition: $712,029
  - Differential Tuition (requires Regents approval): $210,000
  - **PROPOSED PROGRAM FUNDING**: $1,839,713
  - **TOTAL DEPARTMENT FUNDING**: $2,049,713
  - **Difference**: $0

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Expense Narrative
Describe expenses associated with the proposed program.

Thanks to a special projects grant through Perkins, all equipment for the genetics lab has already been purchased. All of the required courses are already offered although enrollments may increase for some as a result of this Certificate. We anticipate many of the classes being completed through Concurrent Enrollment. In order to make them available at as many high schools as possible, we anticipate needing to hire two instructors (Masters-level) who will be shared with Washington Country School District and who will expand the offerings in biology and chemistry through Concurrent Enrollment. In addition, the biological sciences majors already exceed 600 and the program has a single full-time advisor. We plan to add an additional full-time advisor who can also help work with the concurrent enrollment students which they are in high school and as they transition to DSU.

Revenue Narrative 1
Describe what internal reallocations, if applicable, are available and any impact to existing programs or services.

We plan to fund this program through Biotechnology Initiative money through the Utah Department of Workforce Services, and new tuition revenue. As a result, there should be minimal impact to internal funding, existing programs, or services. Any new tuition revenue from students in the Certificate program should help to offset the increase in demand for those courses.

Revenue Narrative 2
Describe new funding sources and plans to acquire the fund.

DSU currently has funds though a Talent Ready Utah grant to market the program and to recruit students in local high schools. We intend to submit a proposal to the Strategic Workforce Initiative for ongoing funding for the advisor and two instructors.