# **Curriculum Development Form (NEW)**

| For additional instructions, see Curriculum Development Form Instructions.   |  |             |               |                                      |             |                |            |            |             |                    |
|--|--|-------------|---------------|--------------------------------------|-------------|----------------|------------|------------|-------------|--------------------|
|  | Type of Action: New Curriculum Development Form A curriculum that has never been offered by any KCTCS college.   |             |               |                                      |             |                |            |            |             |                    |
|  |  |             |               |                                      |             |                | <u> </u>   |            |             |                    |
| 1. C   | urriculum Title:   | F           | Environmenta  | l Biote                              | chnici      | an Certificate |            |            |             |                    |
|  |  | P           | Pilot Approva | l Yes                                | $\boxtimes$ | No 🗌           | (Pilot may | only be    | e used      | for certificates.) |
| 2. C   | redential:   | $\boxtimes$ | Certificate   |                                      |             | Diploma        |            | AAS        |             |                    |
| List name of each certificate, diploma, degree curricula (For AAS programs with multiple options, list each option.).  Credential(s)  Title  Credit  Selective Admission |  |             |               |                                      |             | •              |            |            |             |                    |
|  | AS option)   |             |               |                                      |             |                |            | Yes<br>Yes |             | No<br>No           |
| (d   | i <b>ploma</b> (s)<br>iploma –<br>otion)   |             |               |                                      |             |                |            | Yes<br>Yes |             | No<br>No           |
| Ce   | rtificate(s)   | Envi        | ronmental Bio | technic                              | ian         | 21             |            | Yes        | $\boxtimes$ | No                 |
| 3.   | 3. Submitting Entity: Curriculum Committee: College: BCTC  |             |               |                                      |             |                |            |            |             |                    |
|  | 4. Curriculum Committee Members or College Faculty Responsible for Proposal (Verify that members are still current and active prior to submission.):   |             |               |                                      |             |                |            |            |             |                    |
|  | Name   |             |               |                                      | Teac        | ching Area     |            |            | C           | College            |
|  | rah Davis  | -           |               | <b>Biotechnology Coordinator</b>     |             |                |            | BCTC       |             |                    |
| Jean '   | Watts  |             |               | Environmental Science<br>Coordinator |             |                | ВСТ        | C.C        |             |                    |
| Tracy  | Knowles  |             |               | Chemistry Coordinator                |             |                | ВСТ        | ВСТС       |             |                    |
| Tamn   | ny Liles   |             |               | Assistant Dean, Natural              |             |                | ВСТ        | BCTC       |             |                    |
| Shirle   | ey Whitescarver  | •           |               | Sciences<br>Biology                  |             |                | ВСТ        | ВСТС       |             |                    |
|  | Frisbie  |             |               | Biology                              |             |                |            | BCTC       |             |                    |
|  | ra Carey   |             |               | Academic Dean                        |             |                |            | BCTC       |             |                    |
| Dave   | Hellmich   |             |               | VP, Ac                               | adem        | iics           | ВСТ        | .C         |             |                    |
| Involvement of Others (Identify Individuals):  |  |             |               |                                      |             |                |            |            |             |                    |
|  | System Office S  | staff:      |               |                                      |             |                |            |            |             |                    |
| 6. Others:   |  |             |               |                                      |             |                |            |            |             |                    |
| Proposed Curriculum Data   |  |             |               |                                      |             |                |            |            |             |                    |
| 7.   | Implementation   | Tern        | n: Pilot F    | all 2013                             | ; Full      | Spring 2014    |            |            |             |                    |
|  | 3. Summary and Justification for Proposal:  The Kentucky Postsecondary Education Improvement Act of 1997 charges Kentucky colleges and universities to "facilitate transfer of credit between certificate, diploma, and technical and associate degree programs." A goal of the recently published KCTCS strategic plan (2010-2016) is to <i>Increase Student Transfer of Success</i> , which will be measured by the number of credentials awarded in areas of <i>high wage-high demand fields</i> . This |             |               |                                      |             |                |            |            |             |                    |

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certificate address both of these critical mandates by forming a rich collaboration between two high wage-high

demand career fields, biotechnology and environmental science.

According to the Bureau of Labor and Statistics, the employment of **environmental biotechnicians** across the US is expected to increase at a rate of 29 percent through 2018, and in Kentucky for the same period, the rate of employment of environmental biotechnicians is expected to increase at a rate of nearly 10 percent. Skilled technicians will be needed to collect air, water, and soil samples for measuring levels of pollutants, to monitor compliance with environmental regulations, and to determine appropriate bioremediation measures. Job opportunities are expected to be best for those who can demonstrate technical skills and who are well trained on equipment used both in the field and in laboratories. As the instrumentation and techniques used in industrial research, development, and production become increasingly more complex, employers will seek individuals with highly developed technical skills.

### 9. **Program Description:**

The Environmental Biotechnician Certificate provides hands-on training using an interdisciplinary approach of integrating applied biotechnology to study the natural environment. Green technologies, sustainability, biodegradation, and bioremediation will be explored. Students will collect water, air, and soil samples and conduct experiments related to the detection and monitoring of environmental pollutants. The use of biotechnology laboratory methods, systems biology, and bioinformatics will be emphasized. Students who complete the curriculum satisfactorily are qualified for entry level positions in laboratories or field research companies, including federal, state, or local agencies, university or privately owned biotechnology research labs, or nature resource management organizations. The Environmental Biotechnician Certificate requires successful completion of 21 hours of coursework, which may be earned in 2 semesters, provided all the prerequisites have been met for the required coursework. This is a joint certificate in the Biotechnology Laboratory Technician and Environmental Science Technician programs.

#### 10. a. Program Competency Assessment Instrument(s):

1. Not applicable.

## b. Program Competencies/Student Outcomes:

## Program Title: Environmental Biotechnician Certificate

Upon completion of this program, the graduate can:

- 1. Perform routine laboratory support work, including operating and maintaining laboratory equipment, and preparing reagents.
- 2. Perform applicable field measurements and experiments, including physical and chemical analysis of water, soil, and air systems.
- 3. Maintain a safe and productive work environment and follow all safety rules and written standard operating procedures (SOPs).
- 4. Perform documentation and data analysis, create documents, and communicate results in written and oral formats.
- 5. Demonstrate scientific honesty and personal responsibility.
- 6. Apply concepts and skills of environmental biotechnicians necessary for working in both a field and a laboratory setting.

#### 11. Curriculum:

#### **Program Title:** Environmental Biotechnician Certificate

| Course        | Course        |                               | <u>Credit Hours</u> |
|---------------|---------------|-------------------------------|---------------------|
| <b>Prefix</b> | <u>Number</u> | <u>Course Title</u>           |                     |
| BTN           | 101           | Introduction to Biotechnology | 1                   |
| BTN           | 201           | Biotechnology Techniques I    | 4                   |
| BTN           | 202           | Biotechnology Techniques II   | 4                   |
| CHE           | 170           | General College Chemistry I   | 3                   |

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|     |     | Total Credit Hours                     | 21 |
|-----|-----|--|----|
| EST | 260 | Environmental Methods and Analysis Lab | 2  |
| EST | 170 | Environmental Sampling Laboratory      | 2  |
| EST | 150 | Introductory Ecology                   | 4  |
| CHE | 175 | General College Chemistry Laboratory I | 1  |

## 12. Sample scheduling plan:

| First Year | <u>Course</u><br><u>Prefix</u> | <u>Course</u><br><u>Number</u> | Course Title                           | <b>Credit Hours</b> |
|------------|--------------------------------|--------------------------------|--|---------------------|
| Fall Term  | BTN                            | 201                            | Biotechnology Techniques I             | 4                   |
|            | CHE                            | 170                            | General College Chemistry I            | 3                   |
|            | CHE                            | 175                            | General College Chemistry Laboratory I | 1                   |
|            | EST                            | 150                            | Introductory Ecology                   | 4                   |
|            |                                |                                | Subtotal Fall Term Hours               | 12                  |

| First Year  | Course<br><u>Prefix</u> | <u>Course</u><br><u>Number</u> | Course Title                           | Credit Hours |
|-------------|-------------------------|--------------------------------|--|--------------|
| Spring Term | BTN                     | 101                            | Introduction to Biotechnology          | 1            |
| 1 0         | BTN                     | 202                            | Biotechnology Techniques II            | 4            |
|             | EST                     | 170                            | Environmental Sampling Laboratory      | 2            |
|             | EST                     | 260                            | Environmental Methods and Analysis Lab | 2            |
|             |                         |                                | Subtotal Spring Term Hours             | 9            |

**Signatures:** Complete and submit a signature page.

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