Maryland CTE Program of Study

## Environmental Studies Secondary Program Proposal Form

Maryland State Department of Education

Division of Career Technology and Adult Learning

200 West Baltimore Street

Baltimore, Maryland 21201-2595

This agreement is between the Division of Career Technology and Adult Learning (DCTAL), Maryland State Department of Education, and the local school system listed below.

**LOCAL SCHOOL SYSTEM INFORMATION –** Complete the information requested below, including the original signature of the CTE local director.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Local School System (LSS) and Code: | | | | | | |  | | | | | | | |
| Name of CTE local director: | | | | |  | | | | | Phone: | | |  | |
| LSS Career Cluster: | | | |  | | | | | | | | | | |
| LSS Program Title: | | Environmental Studies/ Natural Resources | | | | | | | | | | | | |
| Pathway Options: | Environmental Studies | | | | | | |  | | |  | | | |
| Tech Prep:  yes  no This program meets the criteria as a Tech Prep Program and the academic and technical course sequences for both secondary and postsecondary programs are attached.  yes  no Enclosed is a copy of the articulation agreement. | | | | | | | | | | | | | | |
| Program Start Date: | | |  | | | | | |  | | |  | | |
| Signature of CTE Local Director: | | | | | |  | | | | | | Date: | |  |
| Signature of Local Superintendent: | | | | | |  | | | | | | Date: | |  |

**TO BE COMPLETED BY MSDE/DCTAL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Date Program Proposal received by CTE Systems Branch: | | | |  | | | | |
| CTE Control Number: | |  | | | Fiscal Year: | |  | |
| CIP Number: | Program: 03.0150 | | Pathway  Option 1: | | | Pathway  Option 2: | | Pathway Option 3 |
| MSDE Cluster Title: | | Environmental Agriculture and Natural Resources | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Approval Starts FY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |  |  | | |
|  |  |  | | |
| Signature, Assistant State Superintendent, Career Technology & Adult Learning | | |  | Date |

**CTE Secondary Program Proposal Contents**

**STEP 1A: PROGRAM ADVISORY COMMITTEE MEMBERS AND THEIR AFFILIATIONS**

Complete the list of the Program Advisory Committee (PAC) members. Members should include employers, local workforce development representatives, economic development personnel, business, or labor representatives, and the remainder should include secondary and postsecondary, academic and technical educators and other stakeholders. Place a check in the appropriate box to indicate the role each person plays. Include all of the information requested for each entry. Use this form or a locally developed form – either one is acceptable as long as all information is provided.

# Program Advisory Committee List

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Membership: First entry should be the industry representative who is leading the PAC.** | | | | | | | | |
| PAC Leader Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | Representation: | | |
| Title: | |  | | | | Industry  Secondary  Postsecondary | | |
| Affiliation: | |  | | | | | | |
| Address1: | |  | | | | | | |
| Address2: | |  | | | | | | |
| City, State, Zip: | |  | | State: | |  | Zip |  |
| Phone: | |  | | Fax: | |  | | |
| Email: | |  | | | | | | |
| Area of Expertise: | |  | | | | | | |
| Role: | Work-based Learning  Curriculum Development  Skills Standards Validation  Staff Development | | | | | | | |
| Program Development | | Other (specify): | |  | | | |

STEP 1B: DOCUMENTED LABOR MARKET DEMAND – Check the appropriate box below.

Demand exists

The PAC will review labor market information on a local, regional and/or state basis. Check this box if demand exists for the identified occupations. The labor market information does not need to be provided with the proposal as long as there is a demand for employees according to data provided by the Department of Labor, Licensing and Regulation (DLLR) or documented by employers in letters or other correspondence.

If evidence for labor market demand is not readily available, attach documentation to the proposal.

Check this box if there is a unique labor market demand for a program and data are not available from the Department of Labor, Licensing and Regulation (DLLR). If the occupation is new or emerging and no data exist, supporting evidence is submitted with the proposal.

**STEP 2A: PROGRAM OVERVIEW – After determining the cluster and pathway options, identify the standards used to develop the CTE program of study. Describe the program to be developed in detail based on what students are expected to know and be able to demonstrate as a result of participating in the program.**

|  |
| --- |
| **Indicate the title and source of the skills standards for this program:** Next Generation Science Standards (NCSS), Common Core Mathematics Standards, and the Maryland Environmental Literacy Standards |
| **Program Overview:**  The Environmental Studies program of study is composed of a four-­‐course sequence that covers environmental, agricultural and natural resource issues and management. Students will engage in scientific inquiry related to local and regional environmental problems and issues in natural resource management. As such, scientific practices are emphasized; these include identification of EANR-­‐related problems, data collection and analysis, computational reasoning, technical writing and communication. Students will be introduced to a variety of technologies and techniques related to environmental research, including remote sensing, ecological monitoring, and analytic testing. This program also emphasizes environmental ethics involved in making decisions that impact local ecosystems and the ability of communities to live sustainably in the region. Students are encouraged to participate in internships, work-­‐study, service learning, and/or job shadow opportunities at any time during the program of study. All students will participate in a capstone experience that involves the conception, development, and implementation of a research project based on individual interest. Students will have the opportunity to earn college credit through articulation agreements with Maryland colleges. |

**STEP 2B: COURSE DESCRIPTIONS AND END OF COURSE ASSESSMENTS – Insert each CTE completer course title. Describe each course based on what students are expected to know and be able to demonstrate as a result of their participation. Check the assessment instrument(s) that will be used to document student attainment of the knowledge and skills included in each course and specify additional information as appropriate.**

|  |
| --- |
| **Course Title: Human Ecology and Environmental Problem Solving** (Recommended pre- requisite or concurrent enrollment in Biology):  **Course Description:** As the introductory EANR course, students will engage in  interdisciplinary study of environmental problems and dilemmas related to population growth, energy usage, air, land and water pollution, commercial agriculture, and biodiversity loss in their communities, the state and the region. These problems and dilemmas will be used to explore science topics such as biogeochemical cycles, hydrology, geology, ecology and climatology. They will explore EANR related careers and investigate one or more of these careers based on individual interests.  Upon successful completion students will know and be able to:  • Use science process skills to engage in inquiry on EANR topics and issues  • Critically evaluate decision-making and cost-benefit of exploiting natural resources and the environment to support human populations  • Demonstrate how the earth's natural systems operate and interrelate with one another  • Delineate natural flows of chemicals, minerals, water and energy  • Critically assess environmental news, information and data sources  • Develop informed views of environmental issues and sustainable use of resources based on critical evaluation of information from primary and secondary sources  • Analyze and synthesize in writing critiques, interpretive summaries, and lab reports  • Identify student interests and related career pathways within EANR fields  **End of Course Assessment**  Partner-developed exam: (To be determined)  Certification or credentialing exam: (specify)  **Course Title: Natural Resource Management**  **Course Description:** This course is an extension of the skills and applications students developed in Course 1. Students will explore existing and emerging principles of  sustainable environmental management such as the precautionary principle, pollution prevention and wingspread principles. This course will strengthen students understanding of local and regional regulation and policy-making as they relate these aspects to sustainability and protection of natural resources such as air, soil, water, land, and wildlife resources. Students will participate in field experiences to enhance learning. Students will learn relevant laboratory and field-based sampling techniques for evaluating ecological conditions and adaptive management principles for conservation.  **Upon successful completion students will know and be able to:**  **•** Summarize local and regional environmental policies and regulations  • Explore the implications of and approaches to sustainability and sustainable use of resources  • Assess the effect and importance of individual behavior in environmental issues  • Relate natural systems and environmental concerns to the student's daily experience  • Engage in field-based explorations of environmental management sites and conservations areas; interact with natural resource managers and field staff  • Gather data on and use computational reasoning to analyze local or regional issues in conservation or natural resource management  • Synthesize research in a written report on an issue in local or regional conservation or natural resource management.  **End of Course Assessment**  Partner-developed exam: (To be determined)  Certification or credentialing exam: (specify) |
| **Course Title: Environmental Technologies and Techniques**  **Course Description:** The focus of this course is emerging and renewable technologies  (Design for the Environment, LEED, carbon auditing, pollution credits, resources shares, wind and solar power), techniques in watershed and landscape restoration, environmental technologies including those related to remote sensing, ecological monitoring and analytic testing. Students will explore and critically evaluate the role of technology in preventing, controlling, mitigating and remediating environmental problems and issues. Student will apply environmental technologies and techniques in practical settings and produce technical reports on the application of these technologies and techniques.  Upon successful completion students will know and be able to:  • Describe how technology can both create and solve environmental problems  • Investigate and apply environmental technologies to prevent, control, mitigate or reverse environmental harm  • Identify local, regional and state environmental, agricultural and natural resources issues that impact human health  • Explain how environmental problems differentially impact diverse socioeconomic populations  • Compare the affordances and hindrances of using established and emergent technologies in managing renewable and non-renewable resources  • Utilize resources to research and evaluate environmental issues including such topics as energy efficiency, conservation methods, wastewater treatment, and industrial cleanup  • Critically evaluate the role of technology in creating and exacerbating as well as mitigating and solving environmental issues  • Apply technologies related to remote sensing, ecological restoration and environmental assessment in practical settings, gather and analyze data from the application of these technologies  • Compose technical, scientific research reports to communicate the outcomes of inquiry on a local environmental issue or topic  **End of Course Assessment**  Partner-developed exam: (To be determined)  Certification or credentialing exam: (specify)  **Course Title: Environmental and Natural Resource Research and Ethics**  **Course Description:** The focus of this course is to develop critical thinking,  communication skills and knowledge of ethics related to EANR issues. Topics will include both plant and animal biomedical research; genetically engineered cells; the use, distribution and availability of natural resources across populations. Students will engage in independent research on current environmental topics and communicate the findings and implications of their research to appropriate audiences. Students will explore the interplay of economic, social, political and cultural aspects of EANR problems and issues, and propose ethical, data-driven solutions.  Upon successful completion students will know and be able to:  • Critically evaluate how human activities affect natural systems  • Explain how environmental problems relate to socioeconomic diverse populations and communities  • Analyze the interconnected the political, social, cultural and economic aspects of environmental problems and issues and develop potential ideas and solutions that integrate these aspects  • Develop informed views of environmental ethics, environmental justice, responsible use of resources and the role of personal decision-making  • Engage in a capstone project whereby students pursue carefully supervised research project to help them make concrete connection between concepts covered in the course sequence and practical settings.  • Gather and analyze data to make claims and warrant potential implications of their research project  • Communicate findings and implications of capstone project through technical report and professional presentation to stakeholders  **NOTE:** A capstone should be included with or substituted for the internship; it should  expand upon individual interests through the conception and implementation of a student-designed project that includes the basic processes of scientific inquiry: formulation of a problem statement or hypothesis, procedural or experimental design, data collection and analysis, production of a technical report to communicate the study and its findings and implications.  **End of Course Assessment**  Certification or credentialing exam: (To be determined)  Nationally recognized examination: (specify) |

STEP 2C: END-OF-PROGRAM ASSESSMENT - Check the assessment instruments that will be used to document student attainment of the program knowledge and skills. Include and identify assessments leading to industry recognized credentials if available and appropriate.

Certification or credentialing exam: To be determined when curriculum is complete-June 2016

**STEP 2D: Program Sequence matrix (Include High School, Associate’s Degree, and Bachelor’s Degree)**

**Identify the pathway options. Complete the program matrix for the 9-12 program leading to a two- or four-year college program of study. Indicate which courses receive CTE credit by placing the number of credits in parentheses after each CTE course. Place an asterisk (\*) next to the concentrator course**.

The program matrix defines a planned, sequential program of study that consists of a minimum of four credits in CTE. Programs usually include at least three credits in school and one or more work-based learning credits. Work-based learning experiences must be included in the sequence to obtain program approval. The program matrix includes the recommended academic and CTE courses identified for the pathway and postsecondary linkages.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **The LSS program title should be the same one that appears on the cover page. If more than one pathway option is offered in the program, complete a matrix for each program option (MSDE will insert the CIP number). Example: An Academy of Information Technology program may include options in web design & programming.** | | | | | |
| **Pathway/Program:** | **Environmental Studies/ Natural Resources** | | **CIP Number  (For MSDE Use)** | **03.0150** | |
| **Graduation Requirements** | **Grade 9** | **Grade 10** | **Grade 11** | **Grade 12** |
| English - 4 | English 9 | English 10 | English 11 | English 12 |
| Social Studies - 3 | US Govt | World History | US History | Government and Economics |
| Mathematics - 3 | Algebra 1 or Geometry | Geometry or  Algebra 2 | Algebra 2 or  Trigonometry | Trigonometry or  Pre-Calculus |
| Science - 3 | Physical Science | Biology | Chemistry | Physics |
| Physical Education -.5  Health Education - .5 | Physical Ed.  Health Ed. |  |  |  |
| Fine Arts - 1 |  | Fine Arts |  |  |
| Technology Education - 1 | Technology Education |  |  |  |
| CTE Completer Program – 4  \*concentrator course |  | Human Ecology and Environmental Problem Solving (1) | Natural Resource Management (1)  and  \*Environmental Technologies and Techniques (1) | Environmental and Natural Resource Research and Ethics (1) |
| Foreign Language - 2 and/or Advanced Technology Ed | Foreign Language I | Foreign Language II |  |  |
| Suggested Electives: |  |  |  |  |

|  |  |
| --- | --- |
| **Two Year College Program Sequence – Program Overview (for Tech Prep Programs only)**  **Many local school systems provide postsecondary matrices in their program of study guides to inform students, parents, and counselors of the opportunities available to those enrolled in the program. Section 2E must be completed before a program is identified as Tech Prep. *A copy of the Tech Prep Articulation Agreement is required to be submitted with the proposal prior to program approval.***  **Describe the program to be developed in detail based on what students are expected to know and be able to demonstrate as a result of participating in the program.**  **The program of study curriculum is in the process of being written and will be completed by June 2016, At that time this section will be completed** | |
| **Program Title:**  **College/Institution:** | |
| **Recommended Sequence – Complete the program matrix for the postsecondary sequence for the Tech Prep program of study. Indicate which courses receive articulated or transcripted credit by PLACING THE NUMBER OF CREDITS IN PARENTHESES after each course title.** | |
| **Semester 1** | **Semester 2** |
|  |  |
| **Semester 3** | **Semester 4** |
|  |  |
| **Provide a list of career options for students who complete the program:** Aquarium Director of Education  Desert Ecologist, Environmental Engineer, Environmental Attorney, Environmental Planner, Environmental Organizing Consultant, Environmental Conservationist, Green Space Designer, Forest Ranger, Natural Resource Specialist, Outdoor Adventure Educator, State Park Resource Ecologist, Wildlife Biologist | |

|  |  |
| --- | --- |
| **Four Year College Program Sequence – Program Overview (for Tech Prep Programs) Complete this matrix if the program includes a four year degree option.**  **Many local school systems provide postsecondary matrices in their program of study guides to inform students, parents, and counselors of the opportunities available to those enrolled in the program. Section 2E must be completed before a program is identified as Tech Prep. *A copy of the Tech Prep Articulation Agreement is required to be submitted with the proposal prior to program approval.***  **Describe the program to be developed in detail based on what students are expected to know and be able to demonstrate as a result of participating in the program.**  **The program of study curriculum is in the process of being written and will be completed by June 2016, At that time this section will be completed** | |
| **Program Title:**  **College/Institution:** | |
| **Recommended Sequence – Complete the program matrix for the postsecondary sequence for the Tech Prep program of study. Indicate which courses receive articulated or transcripted credit by PLACING THE NUMBER OF CREDITS IN PARENTHESES after each course title.** | |
| **Semester 1** | **Semester 2** |
|  |  |
| **Semester 3** | **Semester 4** |
|  |  |
| **Provide a list of career options for students who complete the program:** Aquarium Director of Education  Desert Ecologist, Environmental Engineer, Environmental Attorney, Environmental Planner, Environmental Organizing Consultant, Environmental Conservationist, Green Space Designer, Forest Ranger, Natural Resource Specialist, Outdoor Adventure Educator, State Park Resource Ecologist, Wildlife Biologist | |

STEP 2E: VALUE-ADDED OPTIONS – Fill in the name of the partnering college or agency. Specify the credential that students will earn. Under value-added, indicate the number of credits or hours granted. This information is required before a program can be designated as Tech Prep.

|  |  |  |  |
| --- | --- | --- | --- |
| **Option** | **Partner** | **Credential** | **Value added for CTE completers** |
| Dual Enrollment |  |  |  |
| Transcripted Credit |  |  |  |
| Articulated Credit | Under discussion-will be finalized when the curriculum is complete-June 2016  Towson University | Six credits in cellular Biology and Genetics (BIOL 201) and Biology (BIOL 201) |  |
| Credit by Exam |  |  |  |
| Advanced Placement |  |  |  |
| Apprenticeship Approved by MATC\* |  |  |  |
| Certification(s) |  |  |  |
| License |  |  |  |
| Degree |  |  |  |
| Other (specify) |  |  |  |

**STEP 2F: INDUSTRY-MENTORED PROJECT OR WORK-BASED LEARNING OPPORTUNITIES  
Check each box that applies.**

PAC members and other industry partners provide supervised (WBL) experiences and/or industry-mentored projects for all students who demonstrate performance of the competencies necessary to enter into this phase of the program. Supervised work-based learning experiences are required for all students demonstrating readiness to participate. For the few who do not participate, alternative capstone experiences should be provided (i.e., in school work experiences, a culminating project, or another experience comparable in rigor). Each type of work-based learning is defined in the glossary. Job shadowing is **not** acceptable for credit in a CTE program.

1.  Integrated WBL 2.  Capstone WBL 3.  Registered Apprenticeship   
4.  Internship 5.  Industry-Mentored Project 6.  In-school clinic or school-based enterprise

**STEP 2G: STUDENT ORGANIZATIONS PROVIDED TO STUDENTS IN THE PROGRAM – Check each box that applies or specify if “Other” is selected.**

Students will develop and apply technical and academic skills, as well as Skills for Success, through participation in:

DECA  FFA  SkillsUSA

FBLA  HOSA  OTHER (specify)

STEP 3: COMPLETE THE INSTRUCTIONAL PROGRAM DATA SHEET

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Local School System (LSS) and Code: | | |  | | | |
| Name of CTE local director: | |  | | Phone: |  | |
| LSS Program Title: | **Environmental Studies** | | | | CIP Code: | 03.0150 |

**Pathway Options**

|  |  |
| --- | --- |
| **1.** | **Environmental Studies** |
| **2.** |  |
| **3.** |  |
| **4.** |  |

**INSTRUCTIONAL PROGRAM CREDIT BY GRADE(S)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Credits per year per pathway option as reflected by Course Sequences** | **9** | **10** | **11** | **12** | **TOTAL** |
| Environmental Studies |  | **1** | **2** | **1** | **4** |

**Total number of credits for program completion:** **4**

**CAREER AND TECHNOLOGY EDUCATION PROGRAM SITES**

|  |  |  |
| --- | --- | --- |
| **Pathway Options** | **School Name(s) Sites** | **School Number** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |