2012-2013

Florida Department of Education
Curriculum Framework

Program Title: **Environmental Science Technology**
Career Cluster: **Agriculture, Food & Natural Resources**

	AS	AAS
CIP Number	1703010401	0703010401
Program Type	College Credit	College Credit
Standard Length	64 credit hours	64 credit hours
CTSO	N/A	N/A
SOC Codes (all applicable)	19-4091	19-4091
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Agriculture, Food & Natural Resources career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the environmental science industry within the Agriculture, Food & Natural Resources career cluster.

The content includes but is not limited to conducting environmental surveys, and investigations and evaluations of noise, air and water conditions to determine compliance with public laws and regulations.

Reinforcement of basic skills in English, mathematics, and science appropriate for the job preparatory programs is provided through vocational classroom instruction and applied laboratory procedures or practice. This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the public service industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues.

Program Structure

This program is a planned sequence of instruction consisting of 64 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum of cooperative experience. Whenever the cooperative method is offered, the following is required for each student: (1) a training plan signed by the student, the instructor and the employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and (2) a work station which reflects equipment, skills, and tasks relevant to the student's career goal. Students must receive compensation for work performed.

In accordance with State Board of Education Rule 6A-10.0315, minimum basic skill levels have been established for admittance into a college associate degree program.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 64 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Assessment and Safety Compliance Specialist (0703010402) – 13 hours
Hazardous Materials Specialist (0703010403) – 14 hours
Mold Assessment Specialist (0703010405) – 16 hours

Mold Remediation Specialist (0703010406) – 13 hours
Water Quality Technician (0703010404) – 12 hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate knowledge of the principles of managing and remediation of water pollution.
02.0 Demonstrate knowledge of the principles of managing and remediation of air pollution.
03.0 Demonstrate awareness of environmental noise sources and their monitoring.
04.0 Operate and calibrate laboratory and field instruments used in quantitative and qualitative analysis of pollutants.
05.0 Sample, analyze and calculate data related to air and water pollutants.
06.0 Demonstrate an awareness of radiation monitoring and radioactive contamination control.
07.0 Demonstrate and awareness of solid waste, the problems engendered by solid waste accumulation and disposal and solutions to those problems.
08.0 Demonstrate employability skills.

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Student Performance Standards

Program Title: **Environmental Science Technology**
CIP Numbers: **1703010401 A.S.**
0703010401 A.A.S.
Program Length: **64 credit hours**
SOC Code(s): **19-4091**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate knowledge of the principles of managing and remediation of water pollution--The student will be able to:

- 01.01 Determine chemical and physical properties of water.
- 01.02 Describe microbial systems.
- 01.03 Describe surface water, groundwater systems, hydrologic cycle, and potable water treatment processes.
- 01.04 Describe the marine environment.
- 01.05 Identify types and sources of water contamination.
- 01.06 Describe legal aspects and consequences of pollution.
- 01.07 Collect water samples for analysis.
- 01.08 Identify the accepted water quality standards for effluent from wastewater treatment plants.
- 01.09 Identify the correct and accepted water quality standards for industrial waste effluent.
- 01.10 Demonstrate the technology applied to non-point source pollution control (stormwater and agriculture runoff).

02.0 Demonstrate knowledge of the principles of managing and remediation of air pollution--The student will be able to:

- 02.01 Define and discuss atmosphere, meteorology and topography.
- 02.02 Identify natural and manmade pollutants; their sources, effects, and control techniques.
- 02.03 Collect and analyze air samples.
- 02.04 Describe legal aspects and consequences of air pollution.
- 02.05 List the regulated parameters of emission for selected industrial sources.
- 02.06 List the types of air pollution control devices used to control emissions of sulfur oxides, nitrogen oxides, particulates and volatile organic contaminants.
- 02.07 Measure the air pollutant of a specific source.
- 02.08 Record, interpret and report laboratory analyses.

03.0 Demonstrate awareness of environmental noise sources and their monitoring--The student will be able to:

- 03.01 Define and discuss the physical properties of sound.

03.02 Discuss the threshold of hearing, tolerance, and hearing loss.
03.03 Discuss environmental noise, its effect on humans, and solutions to noise pollution.
03.04 Discuss legal aspects and consequences of noise pollution.
03.05 List the sources of noise.
03.06 Select the regulatory agency that controls noise sources.
03.07 List the control devices for different noise sources.

04.0 Operate and calibrate laboratory and field instruments used in quantitative and qualitative analysis of pollutants--The student will be able to:

04.01 Demonstrate knowledge of basic laboratory operation.
04.02 Operate and calibrate selected laboratory instruments.
04.03 Operate and calibrate selected field instruments and equipment.

05.0 Sample, analyze and calculate data related to air and water pollutants--The student will be able to:

05.01 Gather and analyze selected samples.
05.02 Manipulate data and reach firm conclusions.
05.03 Write selected formal technical reports.
05.04 Identify and perform the correct analysis for selected air pollutants listed with state and federal regulations.
05.05 Identify and perform the correct analysis for selected parameters listed with state and federal regulations for wastewater effluent.

06.0 Demonstrate an awareness of radiation monitoring and radioactive contamination control--The student will be able to:

06.01 Discuss atomic structure, radiation and radioactive decay.
06.02 Discuss types and sources of radiation.
06.03 Demonstrate knowledge of radiation exposure and dosimetry experiments.
06.04 Discuss the immediate and long range effects of radiation on animals and plants.
06.05 Discuss nuclear power plant design, nuclear power hazards, and safety features.
06.06 Discuss nuclear fuel reprocessing and storage.
06.07 Discuss legal aspects and consequences of radioactive pollution.

07.0 Demonstrate an awareness of solid waste, the problems engendered by solid waste accumulation and disposal and solutions to those problems--The student will be able to:

07.01 Discuss the composition, sources and quantity of solid waste.
07.02 Discuss methods of solid waste disposal.
07.03 Discuss various solutions to solid waste accumulations and disposal.
07.04 Discuss the legal aspects and consequences of solid waste pollution.
07.05 Identify the solid wastes from domestic households, municipalities and industry.
07.06 Identify a sanitary landfill.
07.07 Discuss the construction features of a safe landfill.
07.08 Discuss the possibilities of contaminates (leachates) seeping into the groundwater.
07.09 Discuss the need to have monitoring well located around a sanitary landfill.

07.10 Discuss those wastes that are permitted by state and federal regulation to be disposed at a landfill site.

08.0 Demonstrate employability skills--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents that may be required when applying for a job.
08.04 Complete a job application.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.