Curriculum Standard for Animal Systems: Aquaculture Technology

Career Cluster: Agriculture, Food, and Natural Resources ******

Cluster Description: The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fuel, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

Pathway: Animal Systems	**Effective Term:** Fall 2017 (2017*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Aquaculture Technology	CIP Code 01.0303	AAS/Diploma/Certificate	A15120

Pathway Description:

The Aquaculture Technology curriculum prepares individuals for careers in aquaculture and management of aquatic ecosystems. It provides a broad background in science and math as well as specialized course work and practical experience in fish, shellfish, and aquatic plant production and management.

Course work includes biology, chemistry, and math, as well as water quality and limnology, nutrition and feeding, genetics and breeding, facilities construction, and business. Students will spend time working in the industry through the cooperative work experience or conducting an individualized study through the aquaculture project.

Graduates may find employment on private farms and government hatcheries or at public aquariums. Graduates may also start new businesses in fish, shellfish, or aquatic plant farming; pond and lake management services; or home/office aquarium or water garden management services.

Program Major Description: Choose one of the following 4th paragraphs to use in conjunction with the first three paragraphs of the pathway description above for documentation used to identify each Program Major:

Aquaculture Technology. A program that prepares individuals to select, culture, propagate, harvest, and market domesticated fish, shellfish, and marine plants, both freshwater and saltwater. Potential course work includes instruction in the basic principles of aquatic and marine biology; health and nutrition of aquatic and marine life; design and operation of fish farms, breeding facilities, culture beds, and related enterprises; and related issues of safety, applicable regulations, logistics, and supply.

I. General Education Academic Core
[*Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1D SBCCC 400.10*]: *Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.*

Animal Systems: Aquaculture Technology			
Recommended General Education Academic Core	**AAS**	**Diploma**	**Certificate**
Minimum General Education Hours Required:	**15 SHC**	**6 SHC**	**0 SHC**

Courses listed below are *recommended* general education courses for this curriculum standard. Colleges may choose to include additional or alternative general education courses to meet local curriculum needs.

*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.

					AAS	**Diploma**	**Certificate**
Communication:					**6 SHC**	**3-6 SHC**	**Optional**
*	COM	101	Workplace Communication	3 SHC			
	COM	110	Introduction to Communication	3 SHC			
	COM	120	Intro Interpersonal Com	3 SHC			
	COM	231	Public Speaking	3 SHC			
*	ENG	101	Applied Communications I	3 SHC			
*	ENG	102	Applied Communications II	3 SHC			
	ENG	110	Freshman Composition	3 SHC			
	ENG	111	Expository Writing	3 SHC			
	ENG	112	Argument-Based Research	3 SHC			
	ENG	114	Prof Research & Reporting	3 SHC			
	ENG	115	Oral Communication	3 SHC			
	ENG	116	Technical Report Writing	3 SHC			
Humanities/Fine Arts:					**3 SHC**	**0-3 SHC**	**Optional**
	ART	111	Art Appreciation	3 SHC			
*	HUM	101	Values in the Workplace	2 SHC			
	HUM	110	Technology and Society	3 SHC			
	HUM	115	Critical Thinking	3 SHC			
	HUM	230	Leadership Development	3 SHC			
	PHI	230	Introduction to Logic	3 SHC			
	PHI	240	Introduction to Ethics	3 SHC			
Social /Behavioral Sciences:					**3 SHC**	**0-3 SHC**	**Optional**
	ECO	151	Survey of Economics	3 SHC			
	ECO	251	Prin of Microeconomics	3 SHC			
	GEO	111	World Regional Geography	3 SHC			
*	PSY	101	Applied Psychology	3 SHC			
*	PSY	102	Human Relations	2 SHC			
	PSY	118	Interpersonal Psychology	3 SHC			
	PSY	135	Group Processes	3 SHC			
	PSY	150	General Psychology	3 SHC			
*	SOC	105	Social Relationships	3 SHC			
	SOC	210	Introduction to Sociology	3 SHC			
	SOC	215	Group Processes	3 SHC			
Natural Sciences/Mathematics:					**3 SHC**	**0-3 SHC**	**Optional**
	BIO	140	Environmental Biology	3 SHC			
	BIO	160	Introductory Life Science	3 SHC			
	MAT	110	Math Measurement & Literacy	3 SHC			
	MAT	121	Algebra/Trigonometry I	3 SHC			
	MAT	143	Quantitative Literacy	3 SHC			
	MAT	152	Statistical Methods I	4 SHC			
	MAT	171	Precalculus Algebra	4 SHC			
	PHY	110	Conceptual Physics	3 SHC			
	PHY	121	Applied Physics I	4 SHC			

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work-based learning may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. Below is a description of each section under Major Hours.

- **A. Technical Core.** The technical core is comprised of specific courses which are required for all Program Majors under this Curriculum Standard. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the curriculum core courses or core subject area of the AAS program.
- **B. Program Major(s).** The Program Major must include a minimum of 12 semester hours credit from required subjects and/or courses. The Program Major is in addition to the technical core.
- **C. Other Major Hours.** Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from each prefix listed, with the exception of prefixes listed in the core.

Animal Systems: Aquaculture Technology	AAS	Diploma	Certificate
Minimum Major Hours Required:	**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:	**35-37 SHC**	**23-25 SHC**	
*AQU 111 Aquaculture I 3 SHC			
*AQU 220 Aquaculture Facilities 3 SHC			
*BIO 111 General Biology I 4 SHC			
*CHM 151 General Chemistry I 4 SHC			
_OR_			
*CHM 131 Introduction to Chemistry 3 SHC _and_			
CHM 131A Introduction to Chemistry Lab 1 SHC			
B. Program Major(s):			
Aquaculture Technology			
*Culture Techniques. Choose one.			
AQU 112 Aquaculture II 3 SHC			
AQU 260 Aquariology 3 SHC			
* Business. Choose one:			
AQU 120 Aquabusiness 3 SHC			
BUS 110 Introduction to Business 3 SHC			
BUS 280 REAL Small Business 4 SHC			
* Culture Environment. Choose one:			
AQU 210 Limnology & Water Quality 3 SHC			
AQU 270 Water Gardens 3 SHC			
BIO 243 Marine Biology 4 SHC			
FWL 234 Aquatic Ecology 3 SHC			
Other. Choose one:			
AQU 280 Aquaculture Project 2 SHC			
WBL 112 Work-Based Learning I 2 SHC			
Select additional "Other" courses from the AQU, BIO, BUS, or FWL prefix for a minimum of 12 SHC for the Aquaculture Technology AAS program.			
Courses required for the Aquaculture Technology Diploma are designated with *			

C. Other Major Hours. T*o be selected from the following prefixes:*

ACC, AGR, AQU, ART, BIO, BTC, BUS, CHM, CIS, CSC, ECO, EGR, ETR FWL, GIS, HOR, MAT, MKT, PHY, TRF, SRV, and WBL.

Up to two semester hour credits may be selected from ACA.

Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, ITA, JPN, LAT, POR, RUS and SPA.

III. Other Required Hours

A college may include courses to meet graduation or local employer requirements in a certificate (0-1 SHC), diploma (0-4 SHC), or an associate in applied science (0-7 SHC) program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.

IV. Employability Competencies

Fundamental competencies that address soft skills vital to employability, personal, and professional success are listed below. Colleges are encouraged to integrate these competencies into the curriculum by embedding appropriate student learning outcomes into one or more courses or through alternative methods.

A. Interpersonal Skills and Teamwork – The ability to work effectively with others, especially to analyze situations, establish priorities, and apply resources for solving problems or accomplishing tasks.

B. Communication – The ability to effectively exchange ideas and information with others through oral, written, or visual means.

C. Integrity and Professionalism – Workplace behaviors that relate to ethical standards, honesty, fairness, respect, responsibility, self-control, criticism and demeanor.

D. Problem-solving – The ability to identify problems and potential causes while developing and implementing practical action plans for solutions.

E. Initiative and Dependability – Workplace behaviors that relate to seeking out new responsibilities, establishing and meeting goals, completing tasks, following directions, complying with rules, and consistent reliability.

F. Information processing – The ability to acquire, evaluate, organize, manage, and interpret information.

G. Adaptability and Lifelong Learning – The ability to learn and apply new knowledge and skills and adapt to changing technologies, methods, processes, work environments, organizational structures and management practices.

H. Entrepreneurship – The knowledge and skills necessary to create opportunities and develop as an employee or self-employed business owner.

An **Employability Skills Resource Toolkit has been developed by NC-NET for the competencies listed above. Additional information is located at: http://www.nc-net.info/employability.php*

**The *North Carolina Career Clusters Guide was developed by the North Carolina Department of Public Instruction and the North Carolina Community College system to link the academic and Career and Technical Education programs at the secondary and postsecondary levels to increase student achievement. Additional information about Career Clusters is located at: http://www.nc-net.info/NC_career_clusters_guide.php or http://www.careertech.org.*

Summary of Required Semester Hour Credits (SHC) for each credential:

	AAS	Diploma	Certificate
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	**64-76**	**36-48**	**12-18**

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