Curriculum Standard for Sustainability Technologies

Career Cluster: Science, Technology, Engineering, and Mathematics***

Cluster Description: Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.

Pathway: Engineering and Technology	**Effective Term:** Fall 2013 (2013*03)

Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code		Credential Level(s) Offered	Program Major Code
Sustainability Technologies	CIP Code: 15.0503	AAS/Diploma/Certificate	A40370

Pathway Description:

The Sustainability Technologies curriculum is designed to prepare individuals for employment in environmental, construction, renewable energy, or related industries, where key emphasis is placed on energy production and waste reduction along with sustainable technologies.

Course work includes renewable energy, green building technology, and environmental technologies. Additional topics may include sustainability, energy management, waste reduction, renewable energy, site assessment, and environmental responsibility.

Graduates should qualify for positions within the renewable energy, construction, and/or environmental industries. Employment opportunities exist in both the government and private industry sectors where graduates may function as renewable energy technicians, sustainability consultants, environmental technicians, or green building supervisors.

Program 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:***

N/A

**Within the degree program, the institution shall include opportunities for the achievement of competence in reading, writing, oral communication, fundamental mathematical skills, and basic use of computers.*

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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.*

Sustainability Technologies

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.						
Communications:				**6 SHC**	**3-6 SHC**	**Optional**
*	COM	101	Workplace Communication	3 SHC		
	COM	110	Introduction to Personal Communications	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	114	Professional Research & Reporting	3 SHC		
	ENG	116	Technical Report Writing	3 SHC		
Humanities/Fine Arts:				**3 SHC**	**0-3 SHC**	**Optional**
*	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	110	Introduction to Geography	3 SHC		
	GEO	111	World Regional Geography	3 SHC		
	GEO	131	Physical Geography I	4 SHC		
*	PSY	101	Applied Psychology	3 SHC		
*	PSY	102	Human Relations	2 SHC		
	PSY	118	Interpersonal Psychology	3 SHC		
	PSY	138	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**
	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		
	MAT	223	Applied Calculus	3 SHC		
	MAT	271	Calculus I	4 SHC		

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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.

Sustainability Technologies (A40370)					**AAS**	**Diploma**	**Certificate**
Minimum Major Hours Required:					**49 SHC**	**30 SHC**	**12 SHC**
A. Technical Core:							
A diploma offered under this AAS degree requires a minimum of 12 SHC extracted from the required subject/course core of the AAS degree.					**24-25 SHC**	**12 SHC**	
Required Courses:							
	BIO	140	Environmental Biology	3 SHC			
or	ENV	110	Environmental Science	3 SHC			
	SST	110	Intro to Sustainability	3 SHC			
	SST	120	Energy Use Analysis	3 SHC			
	SST	210	Issues in Sustainability	3 SHC			
Required Subject Areas: Select one.							
Renewable Energy.							
	ALT	120	Renewable Energy Tech	3 SHC			
	ALT	250	Thermal Systems	3 SHC			
	ELC	220	Photovoltaic Sys Tech	3 SHC			
	SST	130	Modeling Renewable Energy	3 SHC			
Green Building.							
	ARC	131	Building Codes	3 SHC			
or	CMT	120	Codes and Inspections	3 SHC			
	CST	111	Construction I	4 SHC			
	CST	150	Building Science	3 SHC			
	SST	140	Green Building & Design Concepts	3 SHC			
B. Program Major(s): Not Applicable							

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

AHR, ALT, ARC, AGR, ATR, BAS, BIO, BPR, BUS, CAR, CEG, CHM, CIS, CIV, CMT, CSC, CST, DBA, DFT, EGR, EHS, ELC, ELN, ENV, EPP, FMW, FOR, GEL, GEO, GIS, HOR, ISC, LAR, LID, LSG, MAC, MEC, MNT, NET, OMT, PAD, PHS, PHY, PLU, PME, PMT, SRV, SST, WAT 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.

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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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