

## Curriculum Standard for Science and Math: Zoo and Aquarium Science Technology

**Career Cluster:** Science, Technology, Engineering, and Math \*\*

**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:** Science and Mathematics

**Effective Term:** Fall 2020 (2020\*03)

### Program Majors Under Pathway

Program Major / Classification of Instruction Programs (CIP) Code	CIP Code	Credential Level(s) Offered	Program Major Code
Zoological Science Technology	CIP Code: 26.0709	AAS/Diploma/Certificate	A20250
Aquarium Science Technology	CIP Code: 26.0799	AAS/Diploma/Certificate	A20260

**Pathway Description:**

The Science and Math: Zoo and Aquarium Science Technology curriculum prepares students for employment in zoological parks, aquaria, or other settings requiring animal care, breeding, education, conservation, or health of exotic animals.

Course work emphasizes biology, ethology, husbandry and conservation of animals that are on exhibit for education and/or conservation purposes. Students have practical experiences with basic husbandry skills and animal management techniques. Course work also includes technical skills to educate the public about animal well-being and conservation.

Graduates of the curriculum should qualify for entry-level employment opportunities in a variety of settings, including zoos, aquaria, nature science centers, and animal research facilities.

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

**Zoo Science Technology:** A program that focuses on the application of technical skills in the fields of animal management, conservation and education in a zoo setting. Potential course work includes instruction in animal behavior, principles of zoo sciences, and animal enrichment. Specialized coursework in mammalogy, ornithology, herpetology and zoo pathophysiology are also included.

**Aquarium Science Technology:** A program that focuses on the application of technical skills in the fields of animal management, conservation and education in an aquarium setting. Potential course work includes instruction in animal behavior, aquarium science, life support systems and water quality testing and management. Specialized coursework in marine biology, aquatic pathophysiology, ichthyology, and aquatic invertebrates are also included.

\*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.

Approved by the State Board of Community Colleges on August 16, 2012; Editorial Revision 09/13/12; Editorial Revision 12/14/12; Editorial Revision 08/21/13; CRC Revised 11/07/13; CRC Revised 10/14/14; Prefix Addition 08/01/15; SBCC Revised 03/17/17; SBCC Revised 07/20/18; CCRC Revised-- Electronic Only (RISE Initiative) 10/24/19.

**I. General Education Academic Core**

[Curriculum Requirements for associate degree, diploma, and certificate programs in accordance with 1 D 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.

**Science and Math: Zoo and Aquarium Science Technology**

<b>Recommended General Education Academic Core</b>	<b>AAS</b>	<b>Diploma</b>	<b>Certificate</b>			
<b>Minimum General Education Hours Required:</b>	<b>15 SHC</b>	<b>6 SHC</b>	<b>0 SHC</b>			
<i>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.</i>						
<i>*Recommended certificate and diploma level curriculum courses. These courses may <u>not</u> be included in associate degree programs.</i>						
<b>Communication:</b>						
* COM 101 Workplace Communication 3 SHC	<b>6 SHC</b>	<b>3-6 SHC</b>	<b>Optional</b>			
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						
<b>Humanities/Fine Arts:</b>						
* HUM 101 Values in the Workplace 2 SHC				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
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						
<b>Social /Behavioral Sciences:</b>						
ECO 151 Survey of Economics 3 SHC	<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>			
ECO 251 Prin of Microeconomics 3 SHC						
GEO 110 Introduction to Geography 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						
<b>Natural Sciences/Mathematics:</b>						
BIO 140 Environmental Biology 3 SHC				<b>3 SHC</b>	<b>0-3 SHC</b>	<b>Optional</b>
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						
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.

<b>Science and Math: Zoo and Aquarium Science Technology</b>	<b>AAS</b>	<b>Diploma</b>	<b>Certificate</b>																																																																								
<b>Minimum Major Hours Required:</b>	<b>49 SHC</b>	<b>30 SHC</b>	<b>12 SHC</b>																																																																								
<p><b>A. Technical Core:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">BIO</td> <td style="width: 10%;">111</td> <td style="width: 70%;">General Biology I</td> <td style="width: 10%; text-align: right;">4 SHC</td> </tr> <tr> <td>BIO</td> <td>112</td> <td>General Biology II</td> <td style="text-align: right;">4 SHC</td> </tr> <tr> <td>ZAS</td> <td>112</td> <td>Intro to Zoo/Aquarium Science</td> <td style="text-align: right;">1 SHC</td> </tr> <tr> <td>ZAS</td> <td>113</td> <td>Animal Exhibits</td> <td style="text-align: right;">1 SHC</td> </tr> <tr> <td>ZAS</td> <td>130</td> <td>Introduction to Ethology</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>234</td> <td>Zoo Herpetology</td> <td style="text-align: right;">3 SHC</td> </tr> </table> <p><b>B. Program Major(s).</b></p> <p><b>Zoological Science Technology</b>  <i>Select a minimum of 12 SHC from the following courses for the Zoological Science Technology AAS program:</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">ZAS</td> <td style="width: 10%;">110</td> <td style="width: 70%;">Intro to Zookeeping</td> <td style="width: 10%; text-align: right;">5 SHC</td> </tr> <tr> <td>ZAS</td> <td>131</td> <td>Applied Animal Psych</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>232</td> <td>Zoo Invertebrates</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>235</td> <td>Zoo Ornithology</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>236</td> <td>Zoo Mammalogy</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>271</td> <td>Zoo Pathophysiology</td> <td style="text-align: right;">3 SHC</td> </tr> </table> <p><b>Aquarium Science Technology</b>  <i>Select a minimum of 12 SHC from the following courses for the Aquarium Science Technology AAS program:</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">BIO</td> <td style="width: 10%;">243</td> <td style="width: 70%;">Marine Biology</td> <td style="width: 10%; text-align: right;">3 SHC</td> </tr> <tr> <td>MSC</td> <td>174</td> <td>Marine Invertebrate Zoo</td> <td style="text-align: right;">4 SHC</td> </tr> <tr> <td>ZAS</td> <td>210</td> <td>Intro to Aquarium Science</td> <td style="text-align: right;">5 SHC</td> </tr> <tr> <td>ZAS</td> <td>233</td> <td>Zoo Ichthyology</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>243</td> <td>Prin of Aquarium Science</td> <td style="text-align: right;">3 SHC</td> </tr> <tr> <td>ZAS</td> <td>272</td> <td>Aquatic Pathophysiology</td> <td style="text-align: right;">3 SHC</td> </tr> </table>	BIO	111	General Biology I	4 SHC	BIO	112	General Biology II	4 SHC	ZAS	112	Intro to Zoo/Aquarium Science	1 SHC	ZAS	113	Animal Exhibits	1 SHC	ZAS	130	Introduction to Ethology	3 SHC	ZAS	234	Zoo Herpetology	3 SHC	ZAS	110	Intro to Zookeeping	5 SHC	ZAS	131	Applied Animal Psych	3 SHC	ZAS	232	Zoo Invertebrates	3 SHC	ZAS	235	Zoo Ornithology	3 SHC	ZAS	236	Zoo Mammalogy	3 SHC	ZAS	271	Zoo Pathophysiology	3 SHC	BIO	243	Marine Biology	3 SHC	MSC	174	Marine Invertebrate Zoo	4 SHC	ZAS	210	Intro to Aquarium Science	5 SHC	ZAS	233	Zoo Ichthyology	3 SHC	ZAS	243	Prin of Aquarium Science	3 SHC	ZAS	272	Aquatic Pathophysiology	3 SHC	<b>29 SHC</b>		
BIO	111	General Biology I	4 SHC																																																																								
BIO	112	General Biology II	4 SHC																																																																								
ZAS	112	Intro to Zoo/Aquarium Science	1 SHC																																																																								
ZAS	113	Animal Exhibits	1 SHC																																																																								
ZAS	130	Introduction to Ethology	3 SHC																																																																								
ZAS	234	Zoo Herpetology	3 SHC																																																																								
ZAS	110	Intro to Zookeeping	5 SHC																																																																								
ZAS	131	Applied Animal Psych	3 SHC																																																																								
ZAS	232	Zoo Invertebrates	3 SHC																																																																								
ZAS	235	Zoo Ornithology	3 SHC																																																																								
ZAS	236	Zoo Mammalogy	3 SHC																																																																								
ZAS	271	Zoo Pathophysiology	3 SHC																																																																								
BIO	243	Marine Biology	3 SHC																																																																								
MSC	174	Marine Invertebrate Zoo	4 SHC																																																																								
ZAS	210	Intro to Aquarium Science	5 SHC																																																																								
ZAS	233	Zoo Ichthyology	3 SHC																																																																								
ZAS	243	Prin of Aquarium Science	3 SHC																																																																								
ZAS	272	Aquatic Pathophysiology	3 SHC																																																																								
<p><b>C. Other Major Hours.</b></p> <p><b>To be selected from the following prefixes:</b>            ACC, AGR, ANS, ARC, BIO, BTC, BUS, CHM, CIS, CSC, CST, CUL, DFT, ECO, ETR, FOR, GCM, GIS, HET, HOR, IVS, LAR, LID, LSG, MSC, SST, TRF, VEN, WBL and ZAS</p> <p><i>Up to two semester hour credits may be selected from ACA.</i></p> <p><i>Up to three semester hour credits may be selected from the following prefixes: ARA, ASL, CHI, FRE, GER, IRI, ITA, JPN, LAT, POR, RUS and SPA.</i></p>																																																																											

### 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](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:

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