

Foundational CTE Courses

Career Exploration (22151^)
Employability (22152^)
Entrepreneurship (12053^)
Foundations of Technology (10004^)
Leadership & Service (22101^)

Cluster Courses

MS Robotics (21049)
Exploring STEM in CTE (21050)
PLTW MS Engineering (21000)
Introduction to Technology Education (21051)

Pathway Courses

Aviation Pathway	Engineering Pathway		Computer Science Pathway	Robotics Pathway	Energy Pathway
Fundamentals of Aviation	Introduction to Engineering (21001)	Electronics (17106)	Computer Programming I & II (10152^)	Electronics (17106)	Electronics (17106)
Aviation I (20053)	Introduction to Manufacturing (13001)			Engineering Design & Development (21007)	Engineering Design & Development (21007)
Aviation II	Intro to Drafting & Design (21102)			Computer Programming I & II (10152^)	Introduction to Energy/Power (20101)
PLTW Engineering:	Architectural Drafting & Design (21103)	PLTW Engineering:	PLTW Computer Science:	Robotics (21009)	Alternate Energy Systems (21060)
Aerospace Engineering (21019)	Mechanical Drafting & Design (21106)	Intro to Engineering & Design (21017)	Computer Science Essentials (10013)		
	Bioprocess Engineering (21014)	Principles of Engineering (21018)	Computer Science Principles (10015)		
		Civil Engineering & Architecture (21021)			
		Digital Electronics (21023)			

Dual Credit Courses

Visit www.sdmylife.com for a full list of dual credit courses in the Science, Technology Engineering & Mathematics Career Cluster.

Academic CTE Courses

Physical Science (03159^)
Geometry (02072^)
Biology (03051^)
Trigonometry (02103^)
Biology-Advanced Studies (03052)
Calculus (02121)
Chemistry (03101^)
Physics (03151^)

Capstone CTE Courses

Entrepreneurship Experience (80026) Senior Experience (80019^)
Youth Apprenticeship (80020) Service Learning (22104) Youth Internships (80018^)

^Denotes course is available on the SD Virtual School (<http://www.sdvs.k12.sd.us/>)

Middle School Robotics

Career Cluster	STEM
Course Code	21049
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundational Courses, Cluster Courses, Pathway Courses, Capstone Experience
Student Organization	VEX Robotics, BEST Robotics, FIRST Lego League and FIRST Tech Challenge
Coordinating Work-Based Learning	tours of local businesses with robotics virtual tours of industrial robots http://highered.mheducation.com/sites/dl/free/0078308291/223250/robot.html
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	STEM Cluster Endorsement; 7-12 Technology Education Endorsement
Resources	

Course Description:

Middle School Robotics course allows students to develop an understanding of how robots function, their applications, and how to program them to perform specified tasks.

Program of Study Application

This course is a STEM Cluster course, which may be followed by the STEM Pathway course of Mechatronics/Robotics, followed by a Senior Capstone course.

Career Cluster: STEM

Course: Middle School Robotics

Course Standards

Indicator # MSMR 1 Understand the components that make up a robot

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	MSMR 1.1. Know the equipment used in robotics.	
Two Skill/Concept	MSMR 1.2. Identify various mechanical systems used in robotics	
Three Strategic Thinking	MSMR 1.3. Demonstrate the use of programming commands	

Indicator # MSMR 2 Investigate the impact of robotics on our society

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	MSMR 2.1. Compare and contrast robotics labor vs. human labor	
Two Skill/Concept	MSMR 2.2. Explore career outlook for robotic applications	
Two Skill/Concept	MSMR 2.3. Explore new entrepreneurial opportunities using robotics	

Career Cluster: STEM

Course: Middle School Robotics

Indicator # MSMR 3 Design a robot to solve a particular problem

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	MSMR 3.1. Identify robotic application	
Four Extended thinking	MSMR 3.2. Propose a robotic design	
Four Extended thinking	MSMR 3.3. Construct a functional robot.	
Four Extended thinking	MSMR 3.4. Program a robot to perform a specific task.	
Four Extended thinking	MSMR 3.5. Evaluate robot programming	

Exploring STEM in CTE

Career Cluster	STEM
Course Code	21050
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Cluster course for Middle or High school.
Student Organization	None
Coordinating Work-Based Learning	field trips
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	Architecture & Construction Cluster Endorsement; STEM Cluster Endorsement; 7-12 Technology Education Endorsement
Resources	https://Vimeo.com/67277269

Course Description: This course serves as an introduction to Science, Technology, Engineering and Mathematics (STEM) with primary areas of focus on aviation, energy, engineering, and robotics. It will provide a basic background to allow students to identify interests which may assist students in pathway and course selection at the secondary level.

Program of Study Application

This is a STEM Cluster Course in the STEM Engineering Pathway. It is recommended that the course be preceded by a series of foundation courses followed by additional cluster courses and more specialized pathway courses at the secondary level. These pathways may include courses related to Robotics, Energy, Engineering and Aviation. This course can be taught at the middle or high school level.

Course Standards**Indicator # STEM 1 Understand the components of STEM in CTE**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	STEM 1.1 Understand the components of STEM in CTE and the impact of STEM on society	
Level 3: Strategic Thinking	STEM 1.2 Explore the impact of STEM in CTE related careers	

Indicator # STEM 2 Understand how Science relates to STEM in CTE

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	STEM 2.1 Understand scientific terminology as it applies to STEM in CTE	
Level 2: Skill/Concept	STEM 2.2 Apply scientific concepts as they relate to STEM in CTE	

Indicator # STEM 3 Understand how Technology relates to STEM in CTE

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	STEM 3.1 Understand technology terminology as it applies to STEM in CTE	
Level 2: Skill/Concept	STEM 3.2 Apply technology concepts as they relate to STEM in CTE	

Indicator # STEM 4 Understand how Engineering relates to STEM in CTE

<i>Webb Level</i>	<i>Sub-indicator</i>	

Level 1: Recall	STEM 4.1 Understand engineering terminology as it applies to STEM in CTE	
Level 2: Skill/Concept	STEM 4.2 Apply engineering concepts as they relate to STEM in CTE	

Indicator # STEM 5 Understand how Mathematics relates to STEM in CTE

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	STEM 5.1 Understand mathematical terminology as it applies to STEM in CTE	
Level 2: Skill/ Concept	STEM 5.2 Apply mathematical concepts as they relate to STEM in CTE	
Level 2: Skill/Concept	STEM 5.3 Understand and apply measurement tools and practices	

Indicator # STEM 6 Understand how technical and soft skills apply to STEM and CTE careers.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/ Concept	STEM 6.1 Explore technical skills required for STEM and CTE careers	
Level 2: Skill/ Concept	STEM 6.2 Explore soft skills required for STEM and CTE careers	
Level 2: Skill/ Concept	STEM 6.3 Explore health standards and safety skills in relation to STEM in CTE careers	

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Introduction to Technology Education

Career Cluster	STEM
Course Code	21051
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundational course
Student Organization	None
Coordinating Work-Based Learning	Field trips
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	Architecture & Construction Cluster Endorsement; Manufacturing Cluster Endorsement; STEM Cluster Endorsement; Transportation, Distribution & Logistics Cluster Endorsement; 7-12 Technology Education Endorsement
Resources	http://www.iste.org/standards/ISTE-standards/standards-for-students ; www.google.com/earth

Course Description: Technology is a significant part of society. Most careers call for some type of technology skills, knowledge, and abilities. Technology education brings deeper meaning to core content concepts while introducing students to various technologies, technical skills, critical thinking processes, and hands-on experiences. Students will increase their technological literacy, problem solving, and creative/critical thinking skills. Within this course the following topics of study will be addressed: nature of technology, technology and society, design process, energy and power, manufacturing, construction, transportation, communication, professionalism, health, safety and the environment.

Program of Study Application- This is a STEM Cluster Course in the STEM Engineering Pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course(s) in STEM, and followed by a more specialized pathway course such as Industrial and Bioprocess Engineering, Mechanical Drafting & Design, Architectural Drafting, and/or Robotics.

Note: Each standard has been addressed at four Webb levels. This differentiation may be used to determine appropriateness for grade level use or progression of learning.

Course Standards

Indicator # ITE 1 Analyze the scope and nature of technology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	ITE 1.1 Examine the relationship between technology and other areas of study	
Level 2: Skill/Concept	ITE 1.2. Understand the effects of technology on the natural environment	
Level 2: Skill/Concept	ITE 1.3. Examine the relationship between the cultural, social, economic, and political effects of technology on society	
Indicator # ITE 2 Apply the system-thinking model (the feedback loop) to technology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	ITE 2.1 Apply the design process to the engineering design process	
Indicator # ITE 3 Solve problems using innovation, research, experimentation, and design		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	ITE 3.1 Use research and experimentation methods to solve problems	

Level 3: Strategic Thinking	ITE 3.2. Use innovative and/or troubleshooting methods to solve problems	
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Indicator # ITE 4 Apply appropriate skill sets to various ranges of technology

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	ITE 4.1. Understand biotechnologies	
Level 2: Skill/Concept	ITE 4.2 Understand energy and power technologies	
Level 2: Skill/Concept	ITE 4.3 Understand information and communication technologies	
Level 2: Skill/Concept	ITE 4.4 Understand transportation technologies	
Level 2: Skill/Concept	ITE 4.5 Understand manufacturing technologies and materials	
Level 2: Skill/Concept	ITE 4.6 Understand construction technologies	

Indicator # ITE 5 Understand ethics and professionalism in technology

<i>Webb Level</i>	<i>Sub-indicator</i>	
Level 3: Strategic Thinking	ITE 5.1 Investigate and demonstrate understanding of professionalism and ethics in the technological environment	

Indicator # ITE 6 Understand safety and health in technology

<i>Webb Level</i>	<i>Sub-indicator</i>	
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Level 2: Skill/Concept	ITE 6.1. Understand implication of health and public safety standards	
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Proposed

Introduction to Engineering

Career Cluster	STEM
Course Code	21001
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundation courses – cluster course – Introduction to Engineering – specialized pathway course – capstone experience
Student Organization	None
Coordinating Work-Based Learning	Industry, guest speakers, field trips
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; 7-12 Technology Education Endorsement
Resources	O*NET - https://www.onetonline.org/ Brinell Hardness Test Methods - www.hardnesstesters.com › Applications National Society of Professional Engineers – https:// www.nspe.org

Course Description:

The Introduction to Engineering course is designed to provide a foundation in engineering for students in South Dakota. Students are engaged in an instructional program that integrates academics and technical preparation and focuses on career awareness and ethics in engineering. This course will prepare students for advanced educational opportunities. Topics addressed in Introduction to Engineering include: exploring the field of engineering, understanding materials and processes used in engineering, investigating systems used in engineering and practicing effective communication.

Program of Study Application: This is a pathway course in the STEM cluster Engineering pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course in STEM, and followed by a more specialized pathway course such as Industrial and Bioprocess Engineering, Mechanical Drafting & Design or Architectural Drafting.

Course Standards

Indicator # IE 1 Examine the fields of engineering		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	IE 1.1 Examine the evolution of engineering	
Level 1: Recall	IE 1.2 Identify types of engineers	
Level 1: Recall	IE 1.3 Describe the engineering team	

Indicator # IE 2 Investigate various engineering systems		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	IE 2.1 Identify various types of engineering systems	
Level 2: Skill/Concept	IE 2.2 Apply the engineering design process to solve problems	

Indicator # IE 3 Apply the engineering process to a product		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	IE 3.1 Design a product	
Level 2: Skill/Concept	IE 3.2 Create a three-dimensional (3-D) model	
Level 2: Skill/Concept; Level 3: Strategic Thinking	IE 3.3 Use the engineering design process to build and test a prototype	

Level 2: Skill/Concept; Level 4: Extended Thinking	IE 3.4 Utilize a systems approach to produce a final product	
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Indicator # IE 4 Demonstrate effective communication		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept; Level 3: Strategic Thinking	IE 4.1 Demonstrate effective oral communication	
Level 3: Strategic Thinking; Level 4: Extended Thinking	IE 4.2 Demonstrate effective written communication	
Level 4: Extended Thinking	IE 4.3 Demonstrate effective graphic communication	

Indicator # IE 5 Examine testing procedures used on materials in engineering		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	IE 5.1 Analyze materials based on their properties	
Level 3: Strategic Thinking	IE 5.2 Analyze material testing procedures	

Engineering Design and Development

Career Cluster	STEM
Course Code	21007
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Engineering Pathway, Energy Pathway, and Robotics Pathway.
Student Organization	None
Coordinating Work-Based Learning	Interviewing industry professionals, guest speakers, tours, field trips
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; 9-12 Engineering Endorsement; 7-12 Technology Education
Resources	Community members, industry professionals

Course Description:

Engineering Design and Development is a pathway course in the STEM Engineering Pathway, STEM Energy Pathway, and STEM Robotics Pathway. Students are engaged in an instructional program that integrates academics, problem solving, communication, and technical preparation and focuses on career awareness. This course is designed to provide the student with an engaging opportunity to research, design, innovate and develop technological artifacts (products). This course will prepare students for direct entry into a career, advanced educational opportunities, and lifelong learning.

Program of Study Application

This is a pathway course in the STEM cluster Energy pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course in STEM, and followed by a more specialized pathway course such as Engineering, Energy and Robotics.

Course Standards

Indicator # EDD 1 Utilize the engineering design process to identify a technologically related problem		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	EDD 1.1 Examine current state of a problem	
Level 3: Strategic Thinking	EDD 1.2 Research solution options to solve problem	
Level 3: Strategic Thinking	EDD 1.3 Propose new solutions to solve problem	
Level 4: Extended Thinking	EDD 1.4 Identify the best solution	

Indicator # EDD 2 Utilize the engineering design process to construct a prototype of the solution to problem		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	EDD 2.1 Construct a prototype to model solution	
Level 4: Extended Thinking	EDD 2.2 Test prototype for effectiveness	

Indicator # EDD 3 Utilize the engineering design process to analyze test data results for prototype performance		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>

Level 4: Extended Thinking	EDD 3.1 Analyze test results	
Level 3: Strategic Thinking	EDD 3.2 Make decisions based on test result data	
Level 4: Extended Thinking	EDD 3.3 Redesign the product to meet performance needs	

Indicator # EDD 4 Communicate solution(s) and the prototype for others		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 4: Extended Thinking	EDD 4.1 Communicate solutions for product	

Robotics

Career Cluster	STEM
Course Code	21009
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundational Courses, Cluster Courses, Pathway Courses, Capstone Experience
Student Organization	None
Coordinating Work-Based Learning	industry tours of local businesses utilizing robotic systems
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Information Technology Cluster Endorsement; Programming & Software Development Pathway Endorsement; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; Manufacturing Cluster Endorsement; Welding & Precision Machining Pathway Endorsement; 7-12 Technology Education Endorsement; K-12 Educational Technology Endorsement; K-12 Classroom Technology Endorsement
Resources	BEST Robotics: http://www.bestinc.org/ FIRST Tech Challenge: http://www.usfirst.org/roboticsprograms/ftc STEM Robotics 101: http://stemrobotics.cs.pdx.edu/node/190?root=291 Career Research: www.sdmylife.com and http://www.onetonline.org

Course Description:

This robotics course emphasizes the design, building, operation, application, and documentation of robotic systems. Students follow the engineering design process, apply basic programming skills, and explore how robots and automated systems are used in industry.

Students will have an understanding of the historical and current uses of robots and automated systems; programmable circuits, interfacing both inputs and outputs; proficient ethical standards for engineering and technology professions; and testing of robots.

Program of Study Application

This is a STEM Pathway Course for the Robotics Pathway, preceded by a Foundational Course(s) and a Cluster Course(s).

Course Standards

Indicator # RBT 1 Identify components of a robotic system		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	RBT 1.1 Describe the parts necessary to make a robot	
Level 2: Skill/ Concept	RBT 1.2 Examine the relationships among the subsystems	

Indicator # RBT 2 Understand safety procedures and ethical issues inherent to robotics		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/ Concept	RBT 2.1. Demonstrate proper safety procedures	
Level 2: Skill/ Concept	RBT 2.2. Determine how to apply OSHA Compliant Lockout – Tag-out procedures	
Level 2: Skill/ Concept	RBT 2.3. Examine current ethical issues	

Indicator # RBT 3 Construct, analyze and troubleshoot circuits		
<i>Webb Level</i>	<i>Sub-indicator</i>	
Level 3: Strategic thinking	RBT 3.1. Build circuit according to schematic diagram	
Level 3: Strategic thinking	RBT 3.2. Calculate circuit parameters	

Level 3: Strategic thinking	RBT 3.3. Measure circuits parameters	
Level 3: Strategic thinking	RBT 3.4. Compare calculated and measured solutions to analyze circuit operation	

Indicator # RBT 4 Design, build and analyze a robotic system		
<i>Webb Level</i>	<i>Sub-indicator</i>	
Level 3: Strategic thinking	RBT 4.1 Using the design process, design, build and program a robot to perform a specified task	
Level 3: Strategic thinking	RBT 4.2 Test and modify the robot for any flaws in hardware or bugs in software components	
Level 3: Strategic thinking	RBT 4.3 Write a technical report evaluating the system performance	

Indicator # RBT 5 Research career opportunities and industry applications		
<i>Webb Level</i>	<i>Sub-indicator</i>	
Level 1: Recall	RBT 5.1 Explore career opportunities in the robotics field	
Level 3: Strategic Thinking	RBT 5.2 Investigate commercial application of robotic systems	

Introduction to Energy/Power

Career Cluster	STEM
Course Code	20101
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundation courses – cluster course – Introduction to Energy/Power – specialized pathway course – capstone experience
Student Organization	None
Coordinating Work-Based Learning	Community/industry speakers
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Energy Pathway Endorsement; 7-12 Technology Education Endorsement
Resources	O*Net - http://www.onetonline.org Occupational Safety and Health Administration (OSHA)- www.osha.gov

Course Description:

The Introduction to Energy and Power course is designed to provide a basic understanding of the various types of energy, how energy is obtained and the relationships among work, energy, and power. Students will also study the history and effects of energy on society, alternative power, safety and ethics.

Program of Study Application

This is a pathway course in the STEM cluster Energy pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course in STEM, and followed by a more specialized pathway course such as Alternative Energy Systems and Electronics.

Course Standards

Indicator # EP 1 Analyze the history of energy/power sources		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Content	EP 1.1 Examine the historical development of energy/power production	
Level 1: Recall	EP 1.2 Assess the impact of energy/power on the way people live and work	

Indicator #EP 2 Examine the relationships among work, energy, and power		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	EP 2.1 Define work, power, and energy	
Level 2: Skill/Concept	EP 2.2 Examine the relationship between power and energy sources	

Indicator # EP 3 Understand the transmission of energy and power		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	EP 3.1 Understand how a mechanical system operates	
Level 2: Skill/Concept	EP 3.2 Understand the types of simple machines	
Level 2: Skill/Concept	EP 3.3 Understand both liquid and gas forms of power transmission	
Level 1: Recall	EP 3.4 Understand the laws that govern electricity	

Indicator # EP 4 Understand alternative energy		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	EP 4.1 Understand the sources of alternative energy	
Level 3: Strategic Thinking	EP 4.2 Analyze the sources of alternative energy	

Indicator # EP 5 Implement safety with power technology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	EP 5.1 Examine safety issues relating to mechanical systems	
Level 2: Skill/Concept	EP 5.2 Employ safety practices with fluids	
Level 1: Recall	EP 5.3 Identify fire classification and extinguishers	
Level 2: Skill/Concept	EP 5.4 Employ safety practices with electricity	

Indicator # EP 6 Understand scientific concepts for energy and power technology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	EP 6.1 Understand how energy converts from one form to another	
Level 2: Skill/Concept	EP 6.2 Understand the categories of energy	
Level 3: Strategic Thinking	EP 6.3 Understand that an engine performing work exhausts thermal energy that cannot be retrieved to the surroundings	
Level 3: Strategic Thinking	EP 6.4 Understand which energy sources can be renewable and non-renewable	

Indicator # EP 7 Explore energy and power career options		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	EP 7.1 Research career opportunities in energy and power fields	

Proposed

Electronics

Career Cluster	STEM
Course Code	17106
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundation courses – cluster course – Introduction to Energy/Power – specialized pathway course – capstone experience
Student Organization	None
Coordinating Work-Based Learning	Field trips/tours, guest speakers
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Information Technology Cluster Endorsement; Networking Systems & Information Support Pathway Endorsement; Manufacturing Cluster Endorsement; Arts, AV Technology & Communications Cluster Endorsement; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; Electronics Endorsement; 7-12 Technology Education Endorsement
Resources	Occupational Safety and Health Administration (OSHA)- http://www.osha.gov Institute of Electrical and Electronics Engineers – https://www.ieee.org

Course Description:

The Introduction to Electronics course is designed to provide a basic understanding electronics which include how to design and create components, diagnose, troubleshoot and repair electronic components. Through classroom study and hands-on experience, students prepare for work within the electronics field using current technology, safety and ethical procedures.

Program of Study Application

This is a pathway course in the STEM cluster Electronics pathway. It is recommended that the course be preceded by a series of foundation courses and a cluster course in STEM, and followed by a more specialized pathway course such as Robotics.

Course Standards

Indicator # E 1 Determine general technical literacy skills		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	E 1.1 Employ appropriate units and abbreviations in electronics	
Level 2: Skill/Concept	E 1.2 Determine unknown values in multiple types of electronic circuits	
Level 1: Recall	E 1.3 Identify proper terminology in electronics	

Indicator # E 2 Demonstrate proficiency in electronic safety		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	E 2.1. Determine physiological responses to electrical shock	
Level 1: Recall	E 2.2. Demonstrate proper safety procedures in the use of soldering and electronics testing equipment	

Indicator # E 3 Demonstrate proficiency in circuit assembly		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	E 3.1. Construct a circuit using schematic symbols for identified components	

Level 2: Skill/Concept	E 3.2. Construct circuit boards using correct soldering principles and techniques	
Level 3: Strategic Thinking	E 3.3. Determine cause of non-operational circuits	

Indicator # E 4 Determine proper use of electronic test equipment

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	E 4.1. Measure resistance, voltage, and current in circuits	
Level 1: Recall	E 4.2. Classify equipment for signal analysis	

Indicator # E 5 Troubleshoot circuits for proper operation

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	E 5.1. Calculate voltage, current, and power solutions in circuits	
Level 2: Skill/Concept	E 5.2. Troubleshoot solutions to analyze circuit operation	

Indicator # E 6 Explore electronics career options

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	E 6.1 Research career opportunities in electronics fields	
Level 1: Recall	E 6.2 Explore career outlook for robotic applications	

Alternative Energy Systems

Career Cluster	STEM
Course Code	21060
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundational Courses, Cluster Courses, Pathway Courses, Capstone Experience
Student Organization	None
Coordinating Work-Based Learning	None
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Energy Pathway Endorsement; 7-12 Technology Education Endorsement
Resources	Teaching Renewable Energy: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_energy/renewablesready_fullreport.pdf National Renewable Energy Laboratory: http://www.nrel.gov/docs/gen/fy01/30927.pdf http://www.nrel.gov/education/educational_resources.html

Course Description:

This course serves as an introductory course in alternative energy. This is a survey of wind, biomass, solar, geothermal, and other non-traditional energy sources.

Program of Study Application

This is a STEM Pathway Course for the Energy Pathway, preceded by a Foundational Course(s) and a Cluster Course(s).

Course Standards

Indicator # AES 1 Understand the historical development of alternative energy systems		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AES 1.1 Understand the historical background of alternative energy generation	
Level 3: Strategic Thinking	AES 1.2 Analyze the role of society in the use of energy generation	
Level 4: Extended Thinking	AES 1.3 Analyze the cultural, socioeconomic and political effects of alternative energy technologies	
Level 3: Strategic Thinking	AES 1.4 Understand the environmental impact of energy production and consumption	

Indicator # AES 2 Understand the types of major energy systems		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AES 2.1 Analyze the characteristics of wind energy generation systems	
Level 4: Extended Thinking	AES 2.2 Analyze the characteristics biomass energy generation systems	
Level 4: Extended Thinking	AES 2.3 Analyze the characteristics of solar energy generation systems	
Level 4: Extended Thinking	AES 2.4 Analyze the characteristics of geothermal energy generation systems	

Career Cluster: STEM

Course: Alternative Energy

Level 2: Skill/Concept	AES 2.5 Analyze the characteristics of traditional energy generation systems	
Level 4: Extended Thinking	AES 2.6 Model an alternative energy system	

Indicator # AES 3 Research alternative energy careers and trends in energy development		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AES 3.1 Identify careers in alternative energy	
Level 1: Recall	AES3.2 Identify future energy resources	

Fundamentals of Aviation

Career Cluster	STEM
Course Code	
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	This course is in the Aviation Pathway and is the first of three courses in the pathway. After completing this course, students could take Aviation 1 and/or Aviation II
Student Organization	Skills USA
Coordinating Work-Based Learning	local airports, air traffic controllers, aerial applicators
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Aviation Pathway Endorsement
Resources	https://www.faa.gov/education/ https://www.faa.gov/education/educator_resources/curriculum/high_school/ https://www.osha.gov/SLTC/airline_industry/

Course Description: This course provides students with an understanding of the science of flight and the history, regulations, and possible career paths within the aviation industry. It also covers the relationships of weight and balance, principles of navigation and flight control, ground and airport operations and services, and Federal Aviation Agency regulations.

Program of Study Application

Aviation is a pathway course in the aviation pathway. Students in this pathway would generally complete foundation courses and one of the STEM cluster courses prior to participating in aviation. After the completion of this course, students could take Aviation I and/or Aviation II.

Course Standards

Indicator # AV-F 1 Identify events in the history of flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 1.1 Identify flight in the ancient world	
Level 2: Skill/Concept	AV-F 1.2 Identify the development of flight in the early 1900s	
Level 2: Skill/Concept	AV-F 1.3 Identify the development of flight during the Golden Age of Flight (1918 to 1939)	
Level 2: Skill/Concept	AV-F 1.4 Identify the development of flight innovation during World War II (1939 to 1945)	
Level 2: Skill/Concept	AV-F 1.5 Identify the development of flight innovation during the Cold War (1945 to 1991)	
Level 2: Skill/Concept	AV-F 1.6 Identify the development of flight innovation (1991 to present)	
Level 3: Strategic Thinking	AV-F 1.7 Analyze current trends in flight	

Indicator # AV-F 2 Investigate the principles of flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AV-F 2.1 Investigate the basic parts and control surfaces on aircraft and drones	
Level 3: Strategic Thinking	AV-F 2.2 Investigate the four forces of flight	
Level 4: Extended Thinking	AV-F 2.3 Investigate basic aerodynamics	

Career Cluster: STEM

Course: Fundamentals of Aviation

Level 3: Strategic Thinking	AV-F 2.4 Investigate airplane and drone stability	
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Indicator # AV-F 3 Understand the flight environment		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 3.1 Comprehend air safety	
Level 2: Skill/Concept	AV-F 3.2 Comprehend the airport layout, inclusive of safety elements	
Level 3: Strategic Thinking	AV-F 3.3 Comprehend airspace control	
Level 2: Skill/Concept	AV-F 3.4 Comprehend radio communications	

Indicator # AV-F 4 Understand aircraft and drone systems and performance		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 4.1 Know the basic aircraft instruments	
Level 2: Skill/Concept	AV-F 4.2 Know aircraft or drone systems	
Level 3: Strategic Thinking	AV-F 4.3 Predict aircraft or drone performance	
Level 3: Strategic Thinking	AV-F 4.4 Calculate weight and balance	

Indicator # AV-F 5 Understand the relationships between weather and flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 5.1 Explain basic weather theory	
Level 2: Skill/Concept	AV-F 5.2 Describe weather patterns and clouds	
Level 2: Skill/Concept	AV-F 5.3 Explain weather hazards	

Career Cluster: STEM

Course: Fundamentals of Aviation

Level 3: Strategic Thinking	AV-F 5.4 Interpret weather data	
Level 2: Skill/Concept	AV-F 5.5 Identify sources of weather information	

Indicator # AV-F 6 Understand navigation in aviation		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	AV-F 6.1. Understand basic navigation	
Level 1: Recall	AV-F 6.2 Understand dead-reckoning and pilotage	
Level 2: Skill/Concept	AV-F 6.3 Utilize a flight computer or GPS programming and tracking	
Level 3: Strategic Thinking	AV-F 6.4 Utilize aeronautical charts	

Indicator # AV-F 7 Understanding drone technology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 7.1 Understand key concepts affecting safe flight of a drone	
Level 2: Skill/Concept	AV-F 7.2 Understand basic drone theory and flight	
Level 2: Skill/Concept	AV-F 7.3 Understand maintenance of drones	

Indicator # AV-F 8 Explore the multiple careers in aviation		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AV-F 8.1 Investigate aviation career fields and occupations.	

Aviation Careers I

Career Cluster	STEM
Course Code	
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundation Courses, Cluster Courses, Pathway Courses, Capstone Experiences
Student Organization	Skills USA
Coordinating Work-Based Learning	local airports, Fixed Base Operators, National Guard, Civil Air Patrol, Experimental Aircraft Association
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Aviation Pathway Endorsement; 7-12 Technology Education Endorsement
Resources	https://www.faa.gov/education/ https://www.faa.gov/education/educator_resources/curriculum/high_school/ https://www.osha.gov/SLTC/airline_industry/ https://youcanfly.aopa.org/high-school/high-school-curriculum https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/

Course Description: This course provides students with the first step towards a Private Pilot's license or Part 107 - Drone Certification. Students will learn basic history of aviation, aircraft type/design, air density, forces of flight, propulsion, airframes, avionics/flight instruments, possible career paths within the aviation industry, and Federal Aviation Agency regulations.

Program of Study Application

Aviation is a pathway course in the aviation pathway. Students in this pathway would generally complete foundation courses and one of the STEM cluster courses prior to participating in aviation.

Course Standards

Indicator # AVC-1 1 Identify events in the history of flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AVC-1 1.1 Identify flight in the ancient world	
Level 2: Skill/Concept	AVC-1 1.2 Identify the development of flight in the early 1900s through today and beyond	

Indicator # AVC-1 2 Investigate the principles of flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-1 2.1 Investigate the basic parts and control surfaces on aircraft	
Level 3: Strategic Thinking	AVC-1 2.2 Investigate the 4 forces of flight	
Level 4: Extended Thinking	AVC-1 2.3 Investigate basic aerodynamics	
Level 3: Strategic Thinking	AVC-1 2.4 Investigate airplane stability	

Indicator # AVC-1 3 Understand the flight environment		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>

Career Cluster: STEM

Course: Aviation I

Level 2: Skill/Concept	AVC-1 3.1 Comprehend air safety	
Level 2: Skill/Concept	AVC-1 3.2 Comprehend the airport layout, inclusive of safety elements	
Level 3: Strategic Thinking	AVC-1 3.3 Comprehend airspace control	
Level 2: Skill/Concept	AVC-1 3.4 Comprehend radio communications	

Indicator # AVC-1 4 Understand aircraft systems and performance		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AVC-1 4.1 Know the basic aircraft instruments	
Level 2: Skill/Concept	AVC-1 4.2 Know aircraft types and systems	
Level 3: Strategic Thinking	AVC-1 4.3 Predict aircraft performance	
Level 3: Strategic Thinking	AVC-1 4.4 Calculate weight and balance	

Indicator # AVC-1 5 Explore the multiple careers in aviation		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	AVC-1 5.1 Investigate aviation career fields and occupations	

Aviation Careers II

Career Cluster	STEM
Course Code	
Prerequisite(s)	Aviation Careers 1
Credit	.5 or 1
Program of Study and Sequence	Foundation Courses, Cluster Courses, Pathway Courses, Capstone Experiences
Student Organization	Skills USA
Coordinating Work-Based Learning	local airports, Fixed Base Operators, National Guard, Civil Air Patrol, Experimental Aircraft Association
Industry Certifications	Private Pilot or Part 107 - Drone Certifications
Dual Credit or Dual Enrollment	TBD
Teacher Certification	STEM Cluster Endorsement; Aviation Pathway Endorsement; 7-12 Technology Education Endorsement
Resources	https://www.faa.gov/education/ https://www.faa.gov/education/educator_resources/curriculum/high_school/ https://www.osha.gov/SLTC/airline_industry/ https://youcanfly.aopa.org/high-school/high-school-curriculum https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/

Course Description: This course provides students with the final step towards a Private Pilot's license or Part 107 - Drone Certification. Students will learn about the flight environment, weather in aviation, airports, navigation/aeronautical charts, aircraft performance, flight medical issues, possible career paths within the aviation industry, and Federal Aviation Agency regulations.

Program of Study Application

Aviation is a pathway course in the aviation pathway. Students in this pathway would generally complete foundation courses and one of the STEM cluster courses prior to participating in aviation.

Course Standards

Indicator # AVC-2 1 Applying the principles of flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 1.1 Utilize the parts and control surfaces on an aircraft in flight	
Level 3: Strategic Thinking	AVC-2 1.2 Utilize the four forces of flight	
Level 4: Extended Thinking	AVC-2 1.3 Utilize aerodynamics in flight	
Level 3: Strategic Thinking	AVC-2 1.4 Implement airplane stability while in flight	

Indicator # AVC-2 2 Operating in a safe flight environment		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 2.1 Practice air safety	
Level 3: Strategic Thinking	AVC-2 2.2 Implement proper procedures at the airport	
Level 4: Extended Thinking	AVC-2 2.3 Practice working in different airspaces	
Level 3: Strategic Thinking	AVC-2 2.4 Implementing proper radio communications	

Indicator # AVC-2 3 Utilizing aircraft systems and performance		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 3.1 Implement proper use of aircraft instruments	
Level 3: Strategic Thinking	AVC-2 3.2 Implement proper use of aircraft systems	
Level 3: Strategic Thinking	AVC-2 3.3 Evaluate and respond to aircraft performance during flight	
Level 3: Strategic Thinking	AVC-2 3.4 Calculate weight and balance	

Indicator # AVC-2 4 Utilize the relationships between weather and flight for safety		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 4.1 Apply basic weather theory to flights	
Level 2: Skill/Concept	AVC-2 4.2 Describe weather patterns and clouds	
Level 3: Strategic Thinking	AVC-2 4.3 Assess weather hazards	
Level 3: Strategic Thinking	AVC-2 4.4 Interpret weather data	
Level 3: Strategic Thinking	AVC-2 4.5 Utilize sources of weather information	

Career Cluster: STEM

Course: Aviation Careers II

Indicator # AVC-2 5 Implement navigation in flight		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 5.1 Implement proper navigation skills	
Level 3: Strategic Thinking	AVC-2 5.2 Utilize dead-reckoning and pilotage	
Level 3: Strategic Thinking	AVC-2 5.3 Utilize a flight computer	
Level 3: Strategic Thinking	AVC-2 5.4 Utilize aeronautical charts	
Level 3: Strategic Thinking	AVC-2 2.4 Implementing proper radio communications	

Indicator # AVC-2 6 Understand aviation physiology		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 6.1 Examine and understand the effect on the body in the flight environment.	

Career Cluster: STEM

Course: Aviation Careers II

Indicator # AVC-2 7 Understand FAA Regulations and Required Flight Paperwork		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 7.1 Examine and understand the current FAA regulations for flight	
Level 3: Strategic Thinking	AVC-2 7.2 Utilizing flight paperwork	

Indicator # AVC-2 8 Explore the multiple careers in aviation		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	AVC-2 8.1 Investigate aviation career fields and occupations.	

Bioprocess Engineering

Career Cluster	STEM
Course Code	21014
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Foundational course, cluster course, and career pathway course
Student Organization	None
Coordinating Work-Based Learning	None
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Agriculture, Food & Natural Resources Cluster Endorsement; Food Products & Processing Pathway Endorsement; Natural Resources & Environmental Service Pathway Endorsement; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; 9-12 Engineering Endorsement; 7-12 Technology Education Endorsement
Resources	http://www.iseek.org/careers/viewCareers?id=15

Course Description: This course is designed to provide information on broad application of ever-emerging field of bioprocessing for students in South Dakota. Students are engaged in an instructional program that integrates academics and technical preparation and focuses on career awareness in bioprocess engineering. This course will prepare students for advanced opportunities that lie in the area of biotechnological advancement. The student will apply the knowledge of engineering and biological sciences to design and develop a process capable of ameliorating environmental pollution, producing valuable products and applying novel technologies to produce alternative sources of transportation fuel. Topics that will be covered in this course include: water and wastewater treatment plants, recycling and reuse, and fermentation processes.

Program of Study Application: This is a pathway course in the STEM cluster engineering pathway. It is recommended that the course be preceded by a series of foundation courses, a cluster course in STEM and more specialized pathway courses such as Introduction

to Engineering, Engineering Design and Development, and Introduction to Manufacturing and followed by dual credit course and/or capstone course.

Course Standards

Indicator # BE 1 Understand the basic concepts of bioprocess system and biotechnological processes		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall; Level 2: Thinking	BE 1.1 Identify bio-based products	
Level 1: Recall and Understand	BE 1.2 Identify microbial processes that can be implemented in bioprocessing	
Level 2: Understand and Demonstrate	BE 1.3 Understand how biotechnology can be integrated with engineering	

Indicator # BE 2 Apply basic knowledge of biological science and engineering in developing products		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall; Level 2: Thinking Explain	BE 2.1 Understand how raw materials are used for developing products	
Level 1: Recall; Level 2: Thinking Explain	BE 2.2 Understand how the chemical composition of a raw material affects the design process and product outcome	

Indicator # BE 3 Understand issues associated with implementation and operation of biotechnological processes		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>

Level 3: Strategic thinking	BE 3.1 Analyze problems associated with bioprocessing, for example, environmental, technical, sustainable	
Level 2: Thinking Explain	BE 3.2 Understand how to operate a bioreactor	

Indicator # BE 4 Career exploration in bioprocess engineering		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3: Strategic thinking	BE 4.1 Explore the role of bioprocess engineering in an agriculture related area	
Level 2: Thinking Explain	BE 4.2 Understand the role of bioprocess engineering in food processing	
Level 2: Thinking Explain	BE 4.3 Understand how bioprocess engineering is critical to water and wastewater treatment technologies	
Level 2: Thinking Explain	BE 4.4 Understand how bioprocess engineering can improve the rural economy	

Indicator # BE 5 Understand safety and health in bioprocessing engineering		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall; Level 2: Thinking Explain	BE 5.1 Understand implications of health and public safety standards.	

Indicator # BE 6 Understand workplace ethics and professionalism in bioprocess engineering		
<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>

Level 1: Recall; Level 2: Skill Concept	BE 6.1 Investigate and demonstrate understanding of professionalism and workplace ethics in the technological environment.	
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Proposed