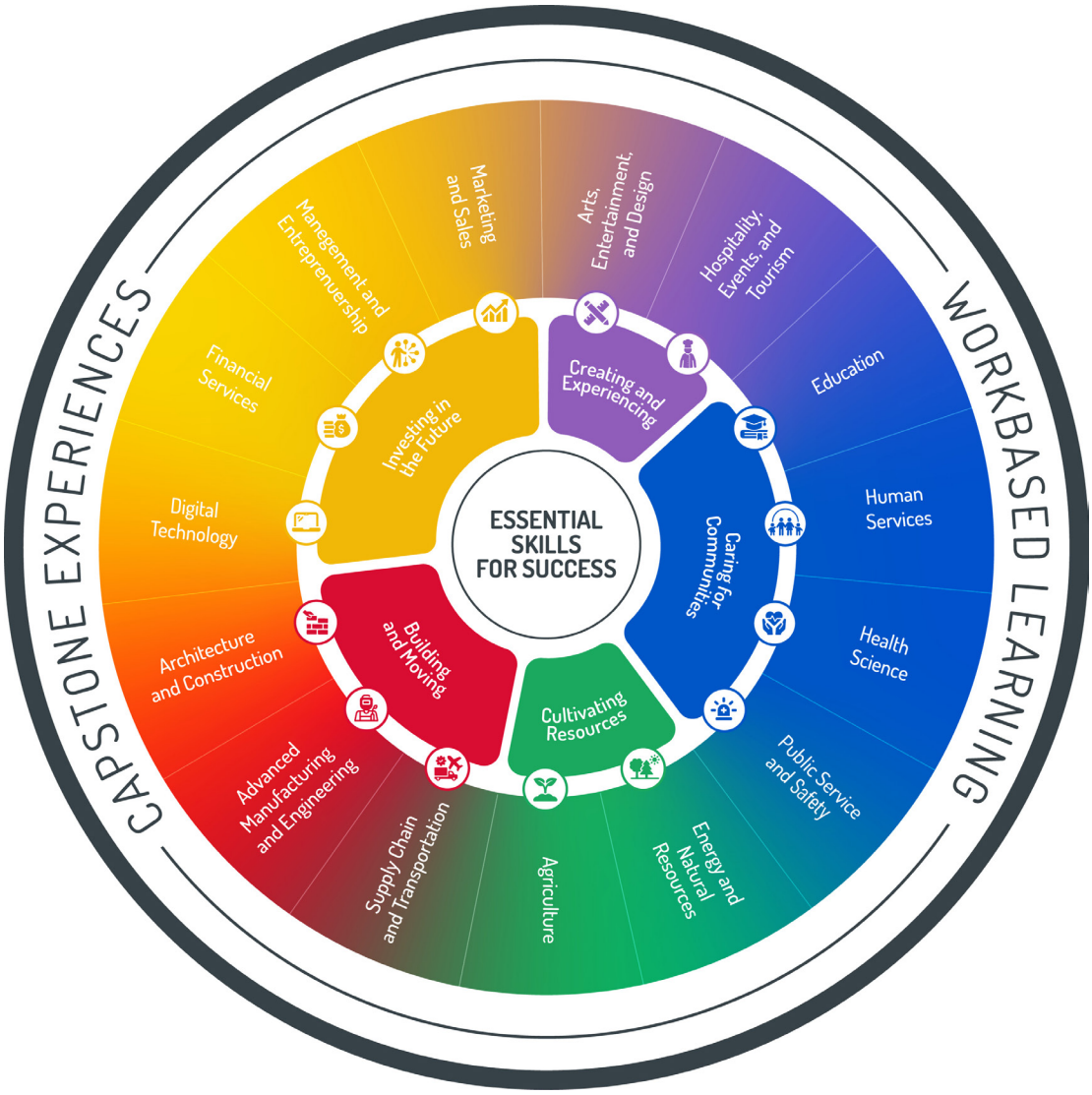
south dakota
DEPARTMENT OF EDUCATION
Learning. Leadership. Service.



Career and Technical Education Content Standards

PROPOSED STANDARDS 2026

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Essential Skills for Success Standards

Essential Skills encompass personal qualities and work habits that shape how individuals interact with others, manage tasks, and approach challenges. These foundational and transferable skills are critical to success in education, the workplace, and daily life regardless of career or pathway. Employers consistently identify communication, collaboration, adaptability, and professionalism as among the most important competencies. Therefore, it is critical that all students leave school sufficiently prepared to apply these essential skills effectively in their future careers.

Career and Technical Education (CTE) is uniquely positioned to help students develop these skills through hands-on, practical learning. Whether it's in a classroom, shop, lab, work-based learning experience, or student organization - CTE provides powerful opportunities for students to build the essential skills they'll use every day in their careers and communities.

The essential skills standards are designed to be integrated across all Career and Technical Education (CTE) clusters as appropriate, rather than being delivered as a separate or stand-alone course. Implementation of these standards is flexible; educators are not required to address every standard in every course but may incorporate those that best align with their program objectives and instructional content.

ESS 1: Self-Development – Take initiative in managing personal and professional growth.	
ESS 1.1	**Goal Setting** • Develop short-term and long-term goals related to school, career, and personal growth. • Examine opportunities in various career pathways that align with personal interests and aptitudes. • Create an action plan to achieve identified goals and objectives.
ESS 1.2	**Reflection** • Engage in thoughtful reflection activities to evaluate goals, experiences, or identified areas of growth. • Make connections to past and future experiences and their impact on goal attainment. • Demonstrate a willingness to seek feedback and a commitment to improve.
ESS 1.3	**Self-Awareness** • Seek out and participate in continual learning opportunities. • Identify personal and professional areas for skills and knowledge growth. • Build and maintain a network of supportive peers and mentors.

	• Explain the importance of developing an appropriate work-life balance and taking care of oneself as necessary.
ESS 2: Professionalism – Demonstrate accountability, timeliness, follow-through on commitments, and ownership of actions.	
ESS 2.1	**Ownership** • Identify consistent and reliable work habits, such as punctuality, follow-through, and effective workday management. • Complete required tasks and projects with little supervision. • Explain how being proactive helps create and maintain positive and professional environments.
ESS 2.2	**Accountability** • Employ personal accountability and integrity when making personal or professional decisions. • Explain the importance of setting goals and meeting deadlines. • Demonstrate ownership of actions and outcomes.
ESS 2.3	**Professionalism** • Model professional behaviors and workplace standards. • Demonstrate appropriate dress and actions for various settings (e.g., academic, career, formal, informal). • Maintain a respectful attitude that contributes to the success of a task, group, or organization. • Prepare professional documents such as resumes, cover letters, and portfolios.
ESS 3: Leadership – Motivate and guide others toward achieving shared goals and objectives.	
ESS 3.1	**Decision-Making** Understand how personal responsibility, consistency, and integrity affect decision-making. Reflect on the impact of decisions before and after they are made. Organize and lead groups effectively. Facilitate task delegation based on teammates' strengths and needs.
ESS 3.2	**Leadership Development** Explain the role and responsibility of an individual in a leadership role. Differentiate between leadership and management. Develop leadership capacity by seeking additional opportunities for learning and growth. Identify areas for professional and personal growth to support continued development as a leader.

ESS 3.3	**Respectfulness** Encourage participation and make sure all voices are heard. Set a positive example through your words and actions. Demonstrate fairness and respect when working and learning with others.
ESS 4: Communication – Convey and receive information clearly, accurately, and effectively.	
ESS 4.1	**Clear and Purposeful Expression** • Organize thoughts in a clear and logical way before communicating in writing or verbally. • Express ideas clearly and concisely. Use appropriate vocabulary, tone, and format for the message being conveyed.
ESS 4.2	**Active Listening and Interpretation** • Demonstrate how to listen to teammates and others without interrupting or interjecting personal thoughts or ideas. • Generate and ask clarifying questions to ensure proper understanding of another's communication. • Summarize or paraphrase messages and information received through listening or reading.
ESS 4.3	**Audience and Context** • Adapt vocabulary, tone, and the format of information to meet the needs of different audiences. • Incorporate the appropriate use of a variety of communication tools and technologies for sharing information and messages. • Discuss the importance of seeking feedback from others to ensure accurate and appropriate information is being shared and received.
ESS 5: Adaptability – Navigate changes, setbacks, or uncertainty with a growth mindset and flexible approach.	
ESS 5.1	**Growth Mindset** • Summarize how challenges and mistakes can be seen as opportunities to learn and grow. • Demonstrate willingness to try new ideas or approaches. • Reflect on a situation and seek feedback to improve performance or an outcome.
ESS 5.2	**Resiliency** • Model a positive attitude in stressful situations. • Manage multiple responsibilities and duties as needed. • Explain the importance of being able to persevere through unfamiliar or difficult tasks, setbacks, or obstacles. • Modify plans or approaches when unexpected issues arise.

ESS 5.3	**Positive Attitude** • Evaluate how individual actions contribute to the betterment of themselves, their teams, community, and workplace. Understand how an individual's mindset can have a positive impact on their personal and professional growth and goals.
ESS 6: Time Management – Effectively organize tasks, commitments, and time efficiently.	
ESS 6.1	**Prioritization** • Classify and manage tasks, activities, and deadlines based on criteria (e.g. priority, urgency, importance, etc.). • Create clear goals and deadlines for both short-term and long-term objectives. • Use appropriate tools and strategies to plan and track responsibilities and tasks.
ESS 6.2	**Organization** • Organize large projects into smaller more manageable steps with deadlines. • Demonstrate how to balance multiple responsibilities or tasks effectively. • Modify schedules and plans as needed to address changes and unexpected events.
ESS 6.3	**Responsibility** • Identify and assess opportunities for improving workflow. • Explain how distractions can affect one's ability to complete tasks accurately and in a timely manner. • Construct and follow through with a plan, then reflect on whether changes were made and/or needed.
ESS 7: Collaboration – Proactively work with others to accomplish a common goal.	
ESS 7.1	**Collaboration and Teamwork** • Demonstrate a willingness to share ideas and resources with others. • Build consensus within a team to accomplish a shared goal. • Contribute toward a group's shared goal. • Explain how individual strengths and needs positively contribute to a collaborative team.
ESS 7.2	**Conflict Resolution** • Identify sources of conflict and address them to reach a shared consensus. • Understand how listening respectfully to others' ideas and feedback contributes to resolving conflicts. • Summarize the role mediation plays in resolving conflicts or disagreements. • Evaluate the successes and failures of a shared goal.

ESS 7.3	**Networking** • Build and maintain professional resources and networks. • Develop professional relationships with supportive peers and mentors to support your personal and professional growth.
ESS 8: Strategic Thinking – Think critically to recognize opportunities and challenges and create effective solutions.	
ESS 8.1	**Problem Solving** • Identify the root cause of a problem and brainstorm possible solutions. • Explain the cause and effect of identified problems. • Analyze the pros and cons of proposed solutions.
ESS 8.2	**Logical Thinking** • Conduct research, gather input, and analyze information necessary for decision making. • Compare and contrast different viewpoints, causes, and potential impacts of a solution. • Create solutions using data and research to support your ideas.
ESS 8.3	**Creativity** • Generate original ideas or approaches to tasks or challenges. • Illustrate how creative thinking can be used to improve existing tasks, processes, or concepts. • Model flexibility and originality when needing to adapt or change individual or group goals.
ESS 9: Digital Literacy – Utilize an array of technology tools for information, communication, and problem solving in an increasingly digital world.	
ESS 9.1	**Information Literacy** • Explain the importance of digital information literacy. • Utilize appropriate technology tools to locate reliable information. • Evaluate the relevance and credibility of digital information used for personal and professional tasks. • Summarize the ethical uses of information and technology related to privacy, intellectual property, artificial intelligence, and other workplace issues.
ESS 9.2	**Digital Communication** • Demonstrate an effective understanding and use of digital tools to communicate effectively. • Adapt communication style and format to suit different digital audiences and purposes.

	• Apply responsible digital citizenship techniques when engaging with others online or through digital media.
ESS 9.3	**Risk Mitigation** • Utilize a variety of technology tools to solve problems. • Understand how to mitigate the risks of technology applications in both personal and professional environments. • Troubleshoot basic technical issues independently or with minimal support or supervision.
ESS 10: Innovation – Demonstrate creativity and curiosity to generate new ideas, improve processes, and develop solutions that add value in the workplace and community.	
ESS 10.1	**Solution Development** • Explain the role brainstorming plays in developing new ideas and solutions. • Use the design-thinking process to test new approaches to solving problems. • Identify areas where improvement or innovation are needed. • Incorporate calculated risk-taking when generating new ideas or methods.
ESS 10.2	**Curiosity and Ingenuity** • Develop new or unique ideas to address existing problems or improve processes. • Generate thoughtful questions to explore new ideas or possibilities. • Describe the importance ingenuity and curiosity play in developing new and effective solutions. • Utilize new information, perspectives, and experiences when solving problems or developing new solutions.
ESS 10.3	**Process Improvement** • Reflect on whether an innovation or idea added value or met the intended goal. • Demonstrate the positive effects of being persistent when exploring or testing new ideas. • Incorporate feedback to refine and improve new ideas or innovations. • Specify the impact new ideas, innovation, or process improvements had on the intended goal or task.

MIDDLE SCHOOL CTE STANDARDS

SOUTH DAKOTA
CAREER & TECHNICAL EDUCATION

MS 1: Evaluate personal interests and strengths to identify potential career paths.	
MS 1.1	Identify personal skills, interests, and talents.
MS 1.2	Recognize how individual strengths relate to career opportunities.
MS 1.3	Explore a personal learning plan for high school to work toward career goals.
MS 2: Explore a variety of careers and industries.	
MS 2.1	Investigate careers across multiple career clusters.
MS 2.2	Use labor market information to determine careers that are in high demand in SD. (SD Department of Labor Hot Jobs).
MS 2.3	Compare different education and training options.
	Explore introductory skills and knowledge across multiple career clusters to build awareness and interest in future careers opportunities.
MS 3: Apply South Dakota's Essential Skills for Success	
MS 3.1	Practice successful use of *SD's 10 Essential Skills for Succes*. (Self-Development, Communication, Strategic Thinking, Professionalism, Time Management, Leadership, Adaptability, Collaboration, Digital Literacy, Innovation.)

Foundational CTE Courses

Foundational Career and Technical Education courses provide students with a starting point for success in all career clusters. As students progress in their CTE experiences, these foundational courses establish a common framework that prepares them by exploring career interests, developing professional skills, and building technical knowledge to succeed in any career field.

Career Exploration - 22151	
CE 1: Identify personal aptitudes, abilities, strengths, talents, and weaknesses.	
CE 1.1	Assess personal strengths, interests, values, and skills to guide career exploration.
CE 1.2	Recognize the relationship between personal attributes and career interests.
CE 2: Explore career clusters to identify career opportunities.	
CE 2.1	Explore all 15 career clusters.
CE 2.2	Identify specific careers of interest within career clusters.
CE 2.3	Analyze in-demand career clusters in South Dakota and your local community.
CE 2.4	Engage with business and industry through career exploration activities. (e.g., guest speakers, career fairs, virtual visits, tours, job shadow experiences)
CE 3: Investigate the knowledge and skills associated with various careers.	
CE 3.1	Research details on career paths of interest. (e.g., job outlooks, training, education requirements, labor market data)
CE 3.2	Compare and contrast characteristics of various careers. (e.g., geographic location, opportunities for advancement, salary and benefits)
CE 3.3	Investigate education/training requirements for employment in industries of interest.
CE 3.4	Identify types of working conditions and environments tied to different careers. (e.g., working remotely, working outside, travel, customer interaction)
CE 4: Explore factors that impact success and satisfaction in careers.	
CE 4.1	Compare and contrast careers of interest, wages, benefits, values, lifestyle preferences, required education, working conditions, working environment, time commitment, prestige)
CE 4.2	Identify and connect with successful individuals in career areas of interest.
CE 5: Develop a personalized learning plan (PLP) aligned to future career goals.	
CE 5.1	Explain the value and importance of a personal learning plan.
CE 5.2	Create a PLP, which includes career(s)/career cluster(s) of interest, related activities/organizations, high school classes, and required training or education after high school.

Employability - 22152	
EMP 1: Demonstrate professional behaviors that contribute to career success.	
EMP 1.1	Identify personal qualities, aptitudes, skills, and values applicable to the workplace.
EMP 1.2	Identify and demonstrate *South Dakota's Essential Skills for Success*.
EMP 1.3	Evaluate personal strengths and areas for professional growth.
EMP 2: Demonstrate skills to successfully seek and obtain employment.	
EMP 2.1	Identify employment opportunities.
EMP 2.2	Create professional employment documents. (e.g., job applications, resumes, cover letters, reference lists, follow-up letters)
EMP 2.3	Demonstrate effective interview skills for employment.
EMP 2.4	Identify the role of networking in preparing for employment.
EMP 2.5	Explore digital networking platforms for professionals.
EMP 2.6	Identify opportunities for career advancement through continuous learning and professional development.
EMP 2.7	Analyze employment requirements related to specific work environments. (e.g., pre-screening, background checks, and digital footprints)
EMP 3: Explore workplace responsibilities.	
EMP 3.1	Research employers' rights and responsibilities.
EMP 3.2	Understand employee rights and responsibilities.
EMP 3.3	Explore why *Essential Skills for Success* are needed to maintain employment.
EMP 3.4	Research career-related education and training requirements for careers of interest.
EMP 3.5	Apply employability concepts through experiential learning.

Workplace Technology Skills - 10004	
WT 1: Create professional digital documents for a variety of personal and work applications.	
WT 1.1	Create and format professional documents.
WT 1.2	Apply design principles to improve readability.
WT 1.3	Incorporate tables, images, hyperlinks, and other features to enhance communication.
WT 1.4	Produce documents using productivity tools. (e.g., mail merge, templates, forms)
WT 1.5	Review, edit, and collaborate on documents.
WT 2: Organize, analyze, and communicate data using digital tools.	
WT 2.1	Create and format spreadsheets to organize information.
WT 2.2	Apply formulas and functions in spreadsheets.
WT 2.3	Use spreadsheets to analyze data and trends.
WT 2.4	Create charts and graphs to represent data for reports.
WT 3: Communicate through professional presentations.	
WT 3.1	Design presentations appropriate for intended audience and purpose.
WT 3.2	Incorporate multimedia, visuals, and data to strengthen presentations.
WT 3.3	Share and present professional presentations.
WT 4: Manage cloud-based tools for storage and collaboration.	
WT 4.1	Organize, store, retrieve, and share digital files.
WT 4.2	Apply effective file naming, version control, and organization to digital files.
WT 4.3	Use digital collaboration tools to communicate and complete team projects.
WT 5: Evaluate and apply emerging technologies.	
WT 5.1	Demonstrate advanced search techniques within a search engine.
WT 5.2	Compare aspects of various search engines.
WT 5.3	Explore appropriate uses of artificial intelligence in personal and work settings.
WT 6: Demonstrate an understanding of cybersecurity and digital security.	
WT 6.1	Identify common cybersecurity threats. (e.g., phishing, malware, scams)
WT 6.2	Demonstrate safe password management.
WT 6.3	Explain the importance of protecting personal information online.

WT 7: Demonstrate responsible digital citizenship.	
WT 7.1	Evaluate digital information for accuracy.
WT 7.2	Analyze the effect of technology on relationships and communication.
WT 7.3	Explore the impact of digital footprints on education, employment, and personal reputation.
WT 7.4	Demonstrate responsible online communication and digital etiquette.

Leadership and Service - 22101	
LS 1: Develop leadership skills through collaboration, communication, and responsible decision making.	
LS 1.1	Examine characteristics, leadership styles, and habits of leaders.
LS 1.2	Demonstrate understanding of organizational structure and meeting protocol.
LS 1.3	Apply strategies for team management. (e.g., goal setting, team building activities, feedback, strategic direction, communication, delegation)
LS 1.4	Demonstrate an understanding of Career and Technical Student Organizations and their roles in preparing future leaders.
LS 1.5	Explore how leadership experiences prepare students for careers and lifelong success.
LS 1.6	Identify local leaders within your community and why they make a significant difference.
LS 2: Explore the importance of community service activities.	
LS 2.1	Identify the needs in a community and the resources available.
LS 2.2	Develop transferable skills through engagement in service learning.
LS 2.3	Plan and carry out service activities effectively.
LS 2.4	Evaluate the impact of community service activities.
LS 2.5	Reflect on personal growth and lessons learned through service experiences.
LS 3: Demonstrate professional leadership.	
LS 3.1	Demonstrate professionalism, integrity, and ethical behavior in leadership situations
LS 3.2	Apply conflict resolution and negotiation strategies to resolve challenges.
LS 3.3	Recognize how effective leadership strengthens teams and organizations.
LS 3.4	Evaluate the impact of leaders in creating positive workplace and community cultures.

Personal Finance - 19262	
PF 1: Analyze personal stregnths, abilities, interests, talents, strengths, and weaknesses.	
PF 1.1	Apply decision-making processes to personal financial situations.
PF 1.2	Evaluate how personal values, goals, and priorities influence financial decisions.
PF 1.3	Develop short-term and long-term financial goals.
PF 1.4	Analyze the consequences of financial choices on future financial well-being.
PF 1.5	Evaluate strategies for adapting financial plans as life circumstances change.
PF 2: Analyze elements that affect personal income and earning potential.	
PF 2.1	Compare possible sources of income. (e.g., wages, salaries, self-employment, investments, passive income)
PF 2.2	Interpret paycheck deductions, taxes, and employee benefits.
PF 2.3	Evaluate education, training, and career decisions based on earning potential, cost of training, and return on investment.
PF 2.4	Analyze how taxes, insurance, and employee benefits contribute to overall financial planning.
PF 3: Develop and manage a personal spending plan.	
PF 3.1	Differentiate between needs, wants, and discretionary spending.
PF 3.2	Develop and monitor a personal budget using digital financial tools.
PF 3.3	Evaluate spending habits to identify opportunities for financial improvement.
PF 3.4	Compare payment methods. (e.g., cash, debit, credit, digital wallets, and online payment apps)
PF 3.5	Analyze consumer choices using comparison shopping and cost-benefit analysis.
PF 4: Evaluate credit, debt, and financial risk.	
PF 4.1	Explain how credit scores influence borrowing and financial opportunities.
PF 4.2	Compare types of consumer credit. (e.g., credit cards, vehicle loans, mortgages, and student loans)
PF 4.3	Evaluate the long-term costs and benefits of borrowing money.
PF 4.4	Analyze strategies for managing debt responsibly.
PF 4.5	Explain the purpose of insurance as part of a comprehensive financial plan.
PF 5: Develop strategies for saving, investing, and building long-term financial security.	
PF 5.1	Compare savings tools used to achieve short-term and long-term financial goals.

PF 5.2	Explain how compound interest contributes to wealth building.
PF 5.3	Compare investment options based on risk, return, and financial goals.
PF 5.4	Evaluate retirement savings strategies and the importance of starting early.
PF 5.5	Develop a long-term financial plan that incorporates saving, investing, and financial security.
PF 6: Practice responsible financial citizenship in a digital economy.	
PF 6.1	Explain the importance of protecting personal financial information.
PF 6.2	Identify common financial scams, fraud, identity theft, and deceptive marketing practices.
PF 6.3	Evaluate the reliability of financial information and digital financial resources.
PF 6.4	Demonstrate ethical and responsible financial decision-making as a consumer.
PF 6.5	Evaluate emerging financial technologies. (e.g., digital banking, electronic payments, cryptocurrency)

Capstone Experiences

Capstone Experiences provide students with the opportunity to apply the knowledge and skills developed throughout their CTE journey in authentic workplace settings. Completed near the end of high school, these experiences connect students with business and industry mentors through high-quality work-based learning. These experiences allow students to further develop technical and essential skills while solidifying their career and post-secondary plans.

Internship Experience - 80018	
IEX 1: Establish an internship experience in collaboration with a business or industry partner.	
IEX 1.1	Identify an internship opportunity aligned with personal interests, post-secondary and career goals.
IEX 1.2	Collaborate with the employer and instructor to develop learning goals, workplace expectations, and internship objectives.
IEX 1.3	Exhibit *Essential Skills for Success* throughout the internship experience.
IEX 2: Apply technical knowledge and workplace skills during the internship experience.	
IEX 2.1	Perform authentic workplace responsibilities that align with the internship placement.
IEX 2.2	Apply technical knowledge and skills developed through prior career and technical education coursework.
IEX 2.3	Demonstrate safe work practices and follow employer policies, procedures, and industry standards.
IEX 3: Engage with a business or industry mentor throughout the internship.	
IEX 3.1	Perform daily work tasks consistent with the responsibilities and work culture of the chosen internship field.
IEX 3.2	Demonstrate initiative, accountability, and increasing independence throughout the internship.
IEX 3.3	Seek and apply constructive feedback to improve workplace performance.
IEX 4 Document and reflect on the internship experience.	
IEX 4.1	Maintain documentation of workplace experiences, hours, responsibilities, and accomplishments.
IEX 4.2	Collect artifacts demonstrating technical skills, certifications, projects, evaluations, or other evidence of learning.
IEX 5: Present and evaluate the internship experience.	
IEX 5.1	Present the internship experience in a public forum. (e.g., video, blog, slideshow presentation, portfolio, visual display, podcast, community presentation)

IEX 5.2	Evaluate personal, technical, and professional growth using employer feedback, self-reflection, and evidence collected throughout the internship.
IEX 5.3	Reflect on personal, technical, and professional growth while identifying future post-secondary and career goals.

Apprenticeship Experience - 80020	
AEX 1: Establish a pre-apprenticeship or apprentice placement with an approved provider.	
AEX 1.1	Collaborate with educators, employers, apprenticeship sponsors, and The South Dakota Department of Labor and Regulation (DLR) to secure an appropriate placement in an apprenticeship or pre-apprenticeship.
AEX 1.2	Secure an apprenticeship work experience placement leading to long-term career goals.
AEX 2: Demonstrate professionalism and workplace readiness.	
AEX 2.1	Demonstrate *Essential Skills for Success* throughout the apprenticeship experience.
AEX 2.2	Apply appropriate workplace safety practices and industry expectations.
AEX 2.3	Demonstrate understanding of employer expectations, workplace policies, and labor practices.
AEX 2.4	Self-evaluate personal performance and develop strategies for continuous improvement.
AEX 2.5	Apply recommendations from supervisors to improve performance.
AEX 3: Demonstrate technical knowledge and skills.	
AEX 3.1	Apply technical skills learned through related instruction during supervised work experiences.
AEX 3.2	Complete assigned workplace competencies to industry standards.
AEX 3.3	Utilize industry-specific tools, equipment, and technology appropriate to the industry.
AEX 4: Document and evaluate the apprenticeship experience.	
AEX 4.1	Maintain documentation of workplace hours, competencies, and accomplishments.
AEX 4.2	Collaborate with the employer, mentor, and instructor to monitor progress toward apprenticeship goals.
AEX 4.3	Present evidence of learning and describe how the apprenticeship experience has prepared them for future post-secondary and career goals.

Service Learning Experience - 22104	
SLX 1: Develop a service learning experience in collaboration with a community organization and mentor.	
SLX 1.1	Identify a community need aligned with personal interests, post-secondary, and career goals.
SLX 1.2	Establish a mentor. (e.g., nonprofit organization, community agency, government entity, community member)
SLX 1.3	Develop learning goals, project expectations, and responsibilities in collaboration with the mentor and instructor.
SLX 1.4	Exhibit *Essential Skills for Success* throughout the service learning experience.
SLX 2: Plan and implement a service learning project that addresses a community need.	
SLX 2.1	Assess community needs through research, stakeholder input, and collaboration with community partners.
SLX 2.2	Develop a project plan that identifies goals, timelines, resources, responsibilities, and expected outcomes.
SLX 2.3	Identify potential project resources. (e.g., people, materials, funds)
SLX 2.4	Adapt project plans based on mentor, stakeholder, or community feedback.
SLX 2.5	Initiate the service learning experience.
SLX 3: Document and reflect on the service learning experience.	
SLX 3.1	Maintain documentation of project activities, milestones, volunteer experiences, and progress throughout the experience.
SLX 3.2	Collect artifacts demonstrating project development, technical skills, community impact, and completed work.
SLX 3.3	Reflect on challenges, successes, feedback, and lessons learned throughout the experience.
SLX 4: Present and evaluate the service learning experience.	
SLX 4.1	Prepare a professional presentation that communicates the community need, project implementation, outcomes, community impact, feedback, and self-reflection.
SLX 4.2	Present the service-learning experience in a public forum. (e.g., video, blog, slideshow presentation, portfolio, visual display, podcast, community presentation)
SLX 4.3	Reflect on personal, technical, and professional growth while identifying future post-secondary, career, civic engagement, or service opportunities.

Senior Experience - 80019	
SRX 1: Develop a personalized capstone experience in collaboration with a business, industry, or community mentor.	
SRX 1.1	Identify a capstone project or product that aligns with personal interests, education, and career goals
SRX 1.2	Establish a business, industry, or community mentor to guide the capstone experience.
SRX 1.3	Develop project goals, timelines, and expectations in collaboration with the mentor and instructor.
SRX 1.4	Exhibit *Essential Skills for Success* throughout the senior experience.
SRX 2: Create a proposal for the senior experience related to career interests.	
SRX 2.1	Develop a project plan with success indicators. (e.g., objectives, required resources, milestones, evaluation criteria)
SRX 2.2	Explain how the project builds upon existing knowledge and skills, while still being challenged with new learning and advanced skills.
SRX 2.3	Create a timeline with defined outcomes for project completion.
SRX 2.4	Identify project resources. (e.g., people, materials, funds, acquisitions, budgeting)
SRX 2.5	Define roles and responsibilities.
SRX 2.6	Identify risks and challenges to the plan.
SRX 2.7	Establish a communication plan with stakeholders.
SRX 2.8	Revise project plans and products based on mentor, instructor, or stakeholder feedback.
SRX: 3 Complete a project or product connected to the senior experience proposal.	
SRX 3.1	Demonstrate educational and personal growth through the project or product.
SRX 3.2	Connect skills and knowledge gained through prior career and technical education coursework relevant to project/product implementation and completion.
SRX 3.3	Communicate regularly with the mentor regarding project progress and guidance.
SRX 4: Document and reflect on the senior experience.	
SRX 4.1	Maintain documentation of project activities, milestones, and progress throughout the experience.

SRX 4.2	Collect artifacts demonstrating project development, technical skills, impact, and completed work.
SRX 4.3	Reflect on challenges, successes, mentor feedback, and lessons learned throughout the project.
SRX 5: Present and evaluate the senior experience.	
SRX 5.1	Prepare a professional presentation that communicates the purpose, process, outcomes, and impact of the project/product.
SRX 5.2	Present the senior experience in a public forum. (e.g., video, blog, slideshow presentation, portfolio, visual display, podcast, community presentation)
SRX 5.3	Reflect on personal, technical, and professional growth while identifying future post-secondary and career goals.

Entrepreneurship Experience - 80026	
ENT 1: Develop an entrepreneurial experience in collaboration with a business or industry mentor.	
ENT 1.1	Identify an entrepreneurial opportunity aligned to personal interests, skills, and career goals.
ENT 1.2	Establish a partnership with a business owner, entrepreneur, or industry mentor to guide the entrepreneurial experience.
ENT 1.3	Develop learning goals and expectations in collaboration with the mentor and instructor.
ENT 1.4	Exhibit *Essential Skills for Success* throughout the entrepreneurship experience.
ENT 2: Investigate and validate an entrepreneurial opportunity.	
ENT 2.1	Identify a customer need, challenge, or market opportunity.
ENT 2.2	Conduct market research to determine the need for the business.
ENT 2.3	Evaluate competitor products, services, and business models.
ENT 2.4	Refine the business concept using mentor feedback.
ENT 3 Develop a comprehensive business plan proposal for a real or hypothetical company based on industry standards.	
ENT 3.1	Create a business model or business plan appropriate for the entrepreneurial venture.
ENT 3.2	Develop and test a product, service, prototype, or minimum viable product.
ENT 3.3	Investigate financial, operational, and marketing strategies to support the venture.
ENT 3.4	Develop a sales and marketing plan.
ENT 3.5	Develop an organizational structure, management scheme, and operational procedures.
ENT 3.6	Formulate financial projections to meet the requirements for funding by a lending institution (e.g., projected sales of goods and/or services, fixed and variable expenses, loan and interest costs)
ENT 4: Maintain documentation of entrepreneurial activities, milestones, and progress throughout the experience.	
ENT 4.1	Collaborate regularly with a business or industry mentor throughout the experience.
ENT 4.2	Create a portfolio documenting the entrepreneurial experience (e.g., business plan documents, evidence of work completed, reflections, mentor feedback, decisions, challenges, and accomplishments).

ENT 5: Present and reflect on the entrepreneurship experience.	
ENT 5.1	Present the business plan and summary of the experience in a public forum. (e.g., video, blog, slideshow presentation, portfolio, visual display, podcast, community presentation)
ENT 5.2	Articulate challenges and successes encountered in the project
ENT 5.3	Develop a postsecondary and career action plan based on entrepreneurial experiences and future goals.

SEQUENCE OF COURSES

ADVANCED MANUFACTURING AND ENGINEERING

BUILDING AND MOVING



south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

ENGINEERING AND ROBOTICS PATHWAY

- 13001 Introduction to Manufacturing
- 21051 Introduction to Technology Skills and Application
- 21001 Introduction to Engineering
- 21007 Engineering Design & Development
- 21009 Robotics
- 21102 Fundamentals of Drafting and Design
- 21103 Architectural Drafting and Design
- 21106 Mechanical Drafting & Design
- 17106 Electronics
- 21017 PLTW Introduction to Engineering Design
- 21018 PLTW Principles of Engineering
- 21019 PLTW Aerospace Engineering
- 21021 PLTW Civil Engineering & Architecture
- 21022 PLTW Computer Integrated Manufacturing
- 21023 PLTW Digital Electronics
- 21024 PLTW Environmental Sustainability
- 21025 PLTW Engineering Design & Development
- 21025 PLTW Engineering Design & Development
- 21026 PLTW Engineering Essentials

WELDING AND PRECISION MACHINING PATHWAY

- 21051 Introduction to Technology Skills and Application
- 13001 Introduction to Manufacturing
- 13203 Machine Tool Technology
- 13204 Advanced Machine Tooling Technology
- 13207 Welding Technology
- 13208 Advanced Welding Technology
- 18404 Ag Metal Fabrications Technology
- 18405 Advanced Ag Metal Fabrication Technology
- 21009 Robotics
- 21102 Fundamentals of Drafting and Design
- 21106 Mechanical Drafting & Design

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

MIDDLE SCHOOL COURSES

- 21050 Exploring STEM in CTE
- 21049 MS Robotics
- 21000 PLTW MS Engineering
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Advanced Manufacturing and Engineering

SOUTH DAKOTA CAREER & TECHNICAL EDUCATION

COURSE DESCRIPTION

The Advanced Manufacturing and Engineering Career Cluster blends innovative technologies and practices to enhance design and production. It covers areas such as engineering, research and development, automation, equipment maintenance, welding, and machining. This Cluster aims to increase efficiency, reduce waste, ensure safety, and produce high-quality goods, driving the industry's growth and adapting to modern demands.

Introduction to Engineering - 21001	
IE 1: Describe safety concepts in engineering industries.	
IE 1.1	Apply general safety principles in the lab and on the jobsite.
IE 1.2	Identify and use personal protective equipment (PPE) for the lab and jobsite.
IE 1.3	Define Occupational Safety and Health Administration (OSHA) and its role in engineering industries.
IE 1.4	Apply general hand and power tool safety procedures.
IE 2: Investigate technical skills for engineering.	
IE 2.1	Identify engineering terminology as it applies to advanced manufacturing and engineering.
IE 2.2	Apply engineering concepts to solve technical problems.
IE 2.3	Apply technical math to concepts in engineering.
IE 2.4	Understand and apply measurement tools and practices.
IE 3: Describe the engineering industry.	
IE 3.1	Explain the evolution of engineering.
IE 3.2	Identify the types of engineers.
IE 3.3	Describe the engineering team.
IE 4: Investigate various engineering systems.	
IE 4.1	Identify various types of engineering systems.
IE 4.2	Apply engineering systems to solve problems.
IE 5: Apply the engineering process to developing a product.	
IE 5.1	Design a product using three-view orthographic projection of a design.
IE 5.2	Construct a three-dimensional (3-D) model.
IE 5.3	Build and test a prototype.
IE 6: Explain the different career opportunities involved in the engineering fields.	
IE 6.1	Research career opportunities in engineering fields.
IE 6.2	Explain educational and industry requirements for employment in the engineering fields.

Introduction to Advanced Manufacturing - 13001	
IAM 1: Career exploration and development.	
IAM 1.1	Explore the evolution of modern facilities and equipment that have transformed manufacturing into a high-tech and precision-driven industry.
IAM 1.2	Compare education and training available for advanced manufacturing (e.g., apprenticeships, technical colleges, and universities).
IAM 1.3	Explain trends and issues in the manufacturing industry.
IAM 2: Implement manufacturing safety practices.	
IAM 2.1	Identify and demonstrate general safety procedures using equipment.
IAM 2.2	Identify ergonomic measures to prevent worker fatigue and injury.
IAM 2.3	Define Occupational Safety and Health Administration (OSHA) and its role in the manufacturing industries.
IAM 2.4	Identify and use personal protective equipment (PPE) for the shop and jobsite.
IAM 3: Utilize the appropriate tools and equipment used in the manufacturing industry.	
IAM 3.1	Research and understand basic manufacturing tools and techniques.
IAM 3.2	Use basic tools and equipment common to the manufacturing processes.
IAM 4: Research various manufacturing plans and drawings.	
IAM 4.1	Identify the features of a manufacturing plan or technical drawing.
IAM 4.2	Identify various measurement tools used in manufacturing.
IAM 4.3	Utilize various measurement tools used in manufacturing with precision.
IAM 4.4	Apply mathematical concepts to measurement techniques.
IAM 5: Apply the manufacturing design process to develop a product.	
IAM 5.1	Interpret or create basic technical drawings and plans.
IAM 5.2	Develop a prototype of a product.
IAM 5.3	Test and evaluate a product.
IAM 5.4	Redesign product for final production.

Introduction to Technical Skills and Applications - 21051	
ITSA 1: Explore careers, educational opportunities, and workforce trends to make informed decisions about future careers in technical industries.	
ITSA 1.1	Explore careers in advanced manufacturing and engineering, architecture and construction, and supply chain and transportation.
ITSA 1.2	Compare education, training, certifications, apprenticeships, and postsecondary pathways required for technical careers.
ITSA 1.3	Investigate workplace roles, responsibilities, and emerging occupations.
ITSA 1.4	Explain how technical careers contribute to local, state, and global economies.
ITSA 2: Demonstrate safe work habits and apply appropriate safety procedures.	
ITSA 2.1	Apply laboratory and workplace safety procedures.
ITSA 2.2	Identify and properly use personal protective equipment (PPE) when working in the shop and jobsite.
ITSA 2.3	Explain Occupational Safety and Health Administration (OSHA) role in maintaining safe workplaces.
ITSA 2.4	Demonstrate safe use of hand tools, power tools, equipment, and materials.
ITSA 2.5	Evaluate workplace hazards and recommend strategies to improve safety.
ITSA 3: Apply systems thinking and the engineering design process to develop, test, evaluate, and improve solutions to technical problems.	
ITSA 3.1	Identify the components of a technological system (inputs, processes, outputs, and feedback).
ITSA 3.2	Explain how feedback improves products and systems.
ITSA 3.3	Apply the engineering design process to solve technical problems.
ITSA 3.4	Construct, test, evaluate, and improve prototypes using design criteria.
ITSA 3.5	Communicate design solutions using appropriate technical vocabulary and documentation.
ITSA 4: Develop and apply foundational technical knowledge and skills through hands-on experiences across multiple career clusters.	
ITSA 4.1	Demonstrate introductory technical skills used in Advanced Manufacturing and Engineering.
ITSA 4.2	Demonstrate introductory technical skills used in Architecture and Construction.
ITSA 4.3	Demonstrate introductory technical skills used in Supply Chain and Transportation.
ITSA 4.4	Select appropriate tools, materials, and technologies to complete technical tasks.
ITSA 5: Use critical thinking, creativity, experimentation, and troubleshooting strategies to solve technical problems and improve products, processes, and systems.	

ITSA 5.1	Use research to identify and define technical problems.
ITSA 5.2	Collect and interpret data to support decision making.
ITSA 5.3	Apply troubleshooting strategies to diagnose and solve problems.
ITSA 5.4	Develop and evaluate innovative solutions using experimentation and testing.
ITSA 5.5	Revise solutions based on data, feedback, and performance results.

Welding Technology - 13207	
WT 1: Explore the different career opportunities involved in the welding industry.	
WT 1.1	Research career opportunities in the welding industry.
WT 1.2	Examine educational and industry requirements for employment in the welding fields.
WT 1.3	Explore the evolution of the welding industry including advanced technology and automation.
WT 2: Implement welding safety practices.	
WT 2.1	Identify and demonstrate proper safety equipment for different types of welding applications.
WT 2.2	Maintain proper condition of safety equipment.
WT 2.3	Identify and use personal protective equipment (PPE) for the shop and jobsite.
WT 3: Integrate core academic concepts as used in the welding industry.	
WT 3.1	Apply mathematical concepts to measurement techniques.
WT 3.2	Read, comprehend, and communicate welding terms and materials from American National Standards Institute (ANSI)/American Welding Society (AWS) A3.0, *Standard Welding Terms and Definitions*.
WT 4: Recognize the materials and equipment used in the welding industry.	
WT 4.1	Identify welding base and filler materials and consumables.
WT 4.2	Recognize material thickness and joint requirements.
WT 4.3	Prepare materials for welding (e.g., cleaning, beveling, and fit-up based on material type).
WT 4.4	Identify and maintain equipment needed for various types of welding.
WT 5: Interpret drawings and welding symbol information.	
WT 5.1	Identify basic weld symbols and joints.
WT 5.2	Read and sketch drawings.
WT 6: Investigate cutting operations within the welding environment.	
WT 6.1	Identify and explain the safety, parts, and operation of thermal cutting equipment.
WT 6.2	Compare and contrast types of cutting processes (e.g., oxyfuel, plasma, laser, and waterjet).
WT 6.3	Prepare layouts for cutting individual parts.
WT 6.4	Perform cuts using thermal cutting and other metal cutting processes.

WT 7: Explore the common welding processes (e.g., Gas Tungsten Arc Welding (GTAW), Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW)).	
WT 7.1	Identify and explain the welding processes and procedures.
WT 7.2	Prepare materials for the welding processes.
WT 7.3	Perform the welding processes in various positions.
WT 8: Fabricate a product using welding processes.	
WT 8.1	Read a simple blueprint to fabricate a product.
WT 8.2	Develop a prototype of a product.
WT 8.3	Test and evaluate a product.
WT 8.4	Redesign product for final production.

Advanced Welding Technology – 13208	
AWT 1: Implement welding safety practices.	
AWT 1.1	Use proper safety equipment for different types of welding applications.
AWT 1.2	Maintain proper condition of safety equipment.
AWT 1.3	Identify and use personal protective equipment (PPE) for the shop and jobsite.
AWT 2: Demonstrate maintenance of machines and equipment.	
AWT 2.1	Maintain electrode holders and wire leads.
AWT 2.2	Perform general maintenance and repair of machines.
AWT 3: Integrate core academic concepts as used in the welding industry.	
AWT 3.1	Demonstrate mathematical skills related to work assignments.
AWT 3.2	Communicate using welding terms and materials from American National Standards Institute (ANSI), American Welding Society (AWS) A3.0, Standard Welding Terms and Definitions.
AWT 4: Interpret, layout, and fabricate in conformance to fabrication drawings.	
AWT 4.1	Interpret and apply dimensions and locations of components in fabrication drawings.
AWT 4.2	Layout and fabricate according to the fabrication drawing industry standards.
AWT 5: Perform other advanced cutting processes.	
AWT 5.1	Identify and explain the safety, parts, and operation of thermal cutting equipment.
AWT 5.2	Prepare layouts for cutting individual parts.
AWT 5.3	Perform cuts using advanced cutting processes.
AWT 6: Perform advanced welding processes.	
AWT 6.1	Identify and understand the safety, parts, and operation of advanced welding process.
AWT 6.2	Prepare base metal for various welding processes.
AWT 6.3	Perform Gas Metal Arc Welding (GMAW) process.
AWT 6.4	Demonstrate advanced welding processes on steel.
AWT 6.5	Explore new technology and future welding processes. (e.g., robotic welding, clean machine, fiber laser, plasma cutting, etc.)
AWT 7: Identify and demonstrate knowledge of the inspection of welding and cutting processes.	
AWT 7.1	Visually inspect and assess quality of a weld.
AWT 7.2	Examine thermally cut surfaces and edges for discontinuities.

AWT 8: Explore the different career opportunities involved in the welding industry.	
AWT 8.1	Explore modern welding and fabrication facilities and how innovations in technology, automation, and equipment have changed the industry.
AWT 8.2	Compare education and training available for advanced manufacturing (e.g., apprenticeships, technical colleges, and universities).
AWT 8.3	Explain trends and issues in the manufacturing industry.

Mechanical Drafting and Design - 21106	
MDD 1: Explore the different career opportunities involved in related industries.	
MDD 1.1	Investigate the diverse career opportunities and professions related to mechanical design and drafting included within advanced manufacturing and engineering.
MDD 1.2	Examine educational and industry requirements for careers in mechanical drafting and design.
MDD 2: Demonstrate the use of geometric design and drafting.	
MDD 2.1	Apply geometric design and mechanical drafting to the design process.
MDD 2.2	Demonstrate basic geometric dimensioning and tolerancing (GD&T).
MDD 3: Prepare mechanical drawings.	
MDD 3.1	Create a multi-view drawing.
MDD 3.2	Examine drawing identification and management techniques used in mechanical drafting.
MDD 3.3	Create sectional views of a mechanical drawing.
MDD 3.4	Develop auxiliary views of mechanical drawings.
MDD 3.5	Generate pictorial drawings.
MDD 4: Explore the process of design for manufacturing and assembly.	
MDD 4.1	Analyze different manufacturing processes.
MDD 4.2	Identify basic welding symbols used in the manufacturing design process.

Engineering Design and Development - 21007	
EDD 1: Explore the different career opportunities involved in related industries.	
EDD 1.1	Research career opportunities in engineering.
EDD 1.2	Examine educational and industry requirements for employment in the engineering fields.
EDD 2: Analyze an engineering related problem.	
EDD 2.1	Examine an engineering problem to determine the pros and cons and the relative importance of the problem.
EDD 2.2	Research options to determine possible solutions to the problem.
EDD 2.3	Develop a design plan and a course of action to solve the problem.
EDD 2.4	Explain and defend the chosen solution.
EDD 3: Construct and test a prototype of the chosen solution.	
EDD 3.1	Design and sketch a prototype to model the proposed solution and show product specifications.
EDD 3.2	Test the prototype for effectiveness and safety factors.
EDD 4: Analyze prototype performance.	
EDD 4.1	Collect and chart/graph test data and synthesize results.
EDD 4.2	Analyze the prototype performance and design concept models based on test results.
EDD 5: Redesign and present resulting prototype.	
EDD 5.1	Redesign the product to meet performance needs based on findings.
EDD 5.2	Create a report and present the resulting prototype to potential clients.

Machine Tool Technology - 13203	
MTT 1: Explore the different career opportunities in machine tool technology related industries.	
MTT 1.1	Research career opportunities in machine tool technology.
MTT 1.2	Compare education and training available for precision machining (e.g., apprenticeships, technical colleges).
MTT 1.3	Explain trends and issues in machine tool technology careers.
MTT 2: Demonstrate knowledge of safety concepts in machine tooling.	
MTT 2.1	Apply general safety principles in the lab.
MTT 2.2	Identify and use personal protective equipment (PPE) for the lab.
MTT 2.3	Demonstrate knowledge of machine shop operations and tool safety procedures consistent with Occupational Safety and Health Administration (OSHA) standards.
MTT 2.4	Apply general hand and power tool safety procedures.
MTT 3: Utilize advanced math skills, formulas, and principles used in precision machining.	
MTT 3.1	Apply geometric formulas to determine areas of components.
MTT 3.2	Apply appropriate formulas to determine percentages/decimals.
MTT 3.3	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
MTT 3.4	Apply appropriate formulas to determine measurement of dimensions, and spaces.
MTT 3.5	Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
MTT 3.6	Define the X,Y,Z coordinates involved in common Computer Numerical Control (CNC) applications and essential academic mechanical drafting, science, etc.
MTT 4: Show proper machine use and functions, utilizing problem solving skills to resolve machining issues.	
MTT 4.1	Explore basic Computer Numerical Control (CNC) programming and processes.
MTT 4.2	Demonstrate knowledge of tools, methods of measurement, and materials
MTT 4.3	Demonstrate testing and problem-solving skills in basic lathe and milling setups and operations.

Advanced Machine Tool Technology - 13204	
AMTT 1: Explore the different career opportunities in machine tool technology related industries.	
AMTT 1.1	Explore machining facilities and how innovations in technology, automation, and equipment have changed the industry.
AMTT 1.2	Compare education and training available for precision machining (e.g., apprenticeships, technical colleges, and universities).
AMTT 2: Demonstrate knowledge of safety concepts in machine tooling.	
AMTT 2.1	Apply general safety principles in the lab.
AMTT 2.2	Identify and use personal protective equipment (PPE) for the lab.
AMTT 2.3	Demonstrate knowledge of machine shop operations and tool safety procedures consistent with Occupational Safety and Health Administration (OSHA) standards.
AMTT 2.4	Apply general hand and power tool safety procedures.
AMTT 3: Utilize advanced math skills, formulas, and principles used in precision machining.	
AMTT 3.1	Apply geometric formulas to determine areas of components.
AMTT 3.2	Apply appropriate formulas to determine percentages/decimals.
AMTT 3.3	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
AMTT 3.4	Apply appropriate formulas to determine measurement of dimensions and spaces.
AMTT 3.5	Utilize both metric and imperial measurements.
AMTT 3.6	Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
AMTT 3.7	Apply the X,Y,Z coordinates involved in common Computer Numerical Control (CNC) applications and essential academic mechanical drafting, science, etc.
AMTT 4: Demonstrate and apply Computer Numerical Control (CNC) programming concepts.	
AMTT 4.1	Manually program a computerized machine utilizing geometry and movement (G & M) codes.
AMTT 4.2	Utilize software to generate usable CNC programs.
AMTT 5: Demonstrate machine use and functions, utilizing problem solving skills to resolve machining issues.	
AMTT 5.1	Utilize prior knowledge of tools, methods of measurement, materials, and material layout.
AMTT 5.2	Set up and run lathe and milling machines to do advanced machining operations.
AMTT 5.3	Evaluate and solve issues related to lathe and milling setups and operations.

Electronics - 17106	
ELEC 1: Determine general technical literacy skills.	
ELEC 1.1	Employ appropriate units and abbreviations in electronics.
ELEC 1.2	Determine unknown values in multiple types of electronic circuits.
ELEC 1.3	Identify proper terminology in electronics.
ELEC 2: Demonstrate understanding of electronic safety.	
ELEC 2.1	Describe the potential effects of electrical shock on the human body.
ELEC 2.2	Demonstrate proper safety procedures in the use of soldering and electronics testing equipment.
ELEC 3: Demonstrate proficiency in circuit assembly.	
ELEC 3.1	Construct a circuit using schematic symbols for identified components.
ELEC 3.2	Construct circuit boards using correct soldering principles and techniques.
ELEC 3.3	Determine cause of non-operational circuits.
ELEC 4: Determine proper use of electronic test equipment.	
ELEC 4.1	Measure resistance, voltage, and currents in circuits.
ELEC 4.2	Classify equipment for signal analysis.
ELEC 5: Troubleshoot circuits for proper operation.	
ELEC 5.1	Calculate voltage, current, and power solutions in circuits.
ELEC 5.2	Troubleshoot solutions to analyze circuit operation.
ELEC 6: Explore electronics career options.	
ELEC 6.1	Research career opportunities in electronics available within a variety of career clusters (e.g., supply chain and transportation, advanced manufacturing and engineering, architecture and construction, and digital technology).
ELEC 6.2	Compare education and training available for electronics and electrical related careers (e.g., apprenticeships, technical colleges, and universities).

Robotics - 21009	
RBT 1: Research career opportunities and industry applications.	
RBT 1.1	Explore career opportunities in the robotics field available within a variety of career clusters such as supply chain and transportation, advanced manufacturing and engineering, architecture and construction, and digital technology.
RBT 1.2	Compare education and training available for robotics and the various names of related programs in South Dakota (e.g., robotics, automation control, SDADA, mechatronics).
RBT 1.3	Investigate commercial application of robotic systems.
RBT 1.4	Identify how robotics impacts the workforce.
RBT 2: Identify components of a robotic system.	
RBT 2.1	Describe the parts necessary to make a robot and explain the interaction between microprocessors, sensors, intelligent controls, and motors.
RBT 2.2	Examine the relationships between the mechanical, electrical, and software subsystems.
RBT 2.3	Investigate artificial intelligence's (AI)impact on robotic systems.
RBT 3: Understand safety procedures and ethical issues inherent to robotics.	
RBT 3.1	Demonstrate proper safety procedures, including proper use of personal protective equipment (PPE).
RBT 3.2	Determine how to apply Occupational Safety and Health Administration (OSHA)Compliant Lockout /Tagout (LOTO) procedures.
RBT 4: Examine possible ethical implications in robotics.	
RBT 4.1	Review the ethical standards for engineering and technology professions.
RBT 4.2	Discuss intellectual property.
RBT 4.3	Evaluate the role of artificial intelligence (AI) in robotics including capabilities, limitations, and ethical implications.
RBT 5: Construct, analyze, and troubleshoot circuits.	
RBT 5.1	Build a circuit according to a schematic diagram.
RBT 5.2	Calculate and record circuit parameters using correct formulas and proper measurement parameters.

RBT 5.3	Measure and record circuit parameters using proper test equipment and measurement parameters.
RBT 5.4	Compare calculated and measured solutions to analyze circuit operation.
RBT 6: Design, build, and analyze a robotic system.	
RBT 6.1	Build and program a robot to perform a specified task.
RBT 6.2	Test the robot for any flaws in hardware or bugs in software components.
RBT 6.3	Write and present a technical report evaluating the system performance including the project's circuit diagrams, block diagrams, flowcharts, and design and implementation procedures.
RBT 6.4	Implement artificial intelligence (AI) to create robotic programs.
RBT 7: Understand installation and maintenance of robotic systems.	
RBT 7.1	Investigate safe space for robotic systems and human interaction.
RBT 7.2	Examine software or firmware updates.
RBT 7.3	Research maintenance and troubleshooting plans for robotic systems.

Cross Cluster Standards also connected with the Advanced Manufacturing Cluster	
Primary Cluster	**Course**
Architecture and Construction	Fundamentals of Drafting and Design – 21102
Agriculture	Ag Metal Fabrication - 18406
Agriculture	Advanced Ag Metal Fabrication - 18406
PLTW course standards are set by Project Lead the Way	

SEQUENCE OF COURSES

AGRICULTURE

CULTIVATING RESOURCES

south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

AGRIBUSINESS AND LEADERSHIP PATHWAY

- 18001 Intro to Ag, Food, and Natural Resources
- 18202 Agribusiness Management
- 18249 Advanced Agribusiness Management
- 18201 Agribusiness Sales & Marketing
- 18203 Ag Leadership & Communications
- 18248 Independent Supervised Agriculture Experience

PLANT SYSTEMS PATHWAY

- 18001 Intro to Ag, Food, and Natural Resources
- 18051 Fundamental Plant Science
- 18057 Advanced Plant Science
- 18052 Fundamental Horticulture
- 18053 Horticulture Operations
- 18308 Agriculture Biotechnology
- 18502 Natural Resource Management
- 18504 Introduction to Natural Resources
- 18508 Issues in Environmental Science
- 18203 Ag Leadership and Communication
- 18248 Independent Supervised Agricultural Experience

ANIMAL SYSTEMS PATHWAY

- 18001 Intro to Ag, Food, and Natural Resources
- 18101 Fundamental Animal Science
- 18107 Advanced Animal Science
- 18102 Companion Animals
- 18302 Ag Processing Technology
- 19254 Food Science
- 18501 Wildlife and Fisheries
- 18308 Agriculture Biotechnology
- 18203 Ag Leadership and Communication
- 18248 Independent Supervised Agricultural Experience

AGRICULTURAL MANUFACTURING AND CONSTRUCTION PATHWAY

- 18001 Intro to Ag, Food, and Natural Resources
- 18401 Fundamental Ag Mechanical Technologies
- 18402 Ag Systems Technology
- 18403 Fundamental Ag Structures Technology
- 18407 Advanced Ag Structures Technology
- 18404 Ag Metal Fabrication Technology
- 18405 Advanced Ag Metal Fabrication Technology
- 17990 Construction Equipment I
- 17991 Construction Equipment II
- 18248 Independent Supervised Agricultural Experience
- 20107 Diesel Technology
- 20999- Introduction to CDL Theory

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE
- 18000 Grades 5-8 Agriculture, Food, and Natural Resources

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Agriculture

The Agriculture Career Cluster introduces students to the breadth of South Dakota's largest industry, exposing them to skills, knowledge, and career opportunities found both on and off the farm. Through this cluster, students will explore the many sectors of industry including ag-related science, business, technology, mechanics, manufacturing, production, and food systems.

Introduction to Ag, Food, and Natural Resources - 18001	
IAFNR 1: Examine the role of FFA in agricultural education programs.	
IAFNR 1.1	Summarize the history, organization, and traditions of FFA.
IAFNR 1.2	Explore opportunities in FFA.
IAFNR 1.3	Demonstrate proper use of parliamentary procedure.
IAFNR 2: Describe the types of Supervised Agricultural Experiences (SAE).	
IAFNR 2.1	Evaluate the benefits and types of SAE programs.
IAFNR 2.2	Develop a plan and maintain SAE records.
IAFNR 3: Discuss the concepts of energy and natural resources.	
IAFNR 3.1	Classify different types of natural resources to enable protection, conservation, enhancement, and management in a particular geographical region.
IAFNR 3.2	Explore South Dakota fish and wildlife species and investigate their ecological needs.
IAFNR 3.3	Explain human interaction with natural resources, fish, and wildlife.
IAFNR 3.4	Explore the types of fuel and energy sources.
IAFNR 4: Describe the animal science industry.	
IAFNR 4.1	Examine the large and small animal science industries.
IAFNR 4.2	Analyze historic and current trends impacting the animal science industry.
IAFNR 5: Describe plant science industry.	
IAFNR 5.1	Examine the plant science and horticulture industries.
IAFNR 5.2	Analyze historic and current trends impacting the plant science and horticulture industries.
IAFNR 6: Summarize basic agricultural business principles.	
IAFNR 6.1	Describe how business decisions are made in agriculture.
IAFNR 6.2	Describe basic agriculture business terminology (e.g., profit, loss, contracts, break-evens, cash-flow, futures).
IAFNR 7: Explore food products and process systems industry.	

IAFNR 7.1	Illustrate how raw commodities become table-ready food products.
IAFNR 7.2	Explain basic food safety principles.
IAFNR 8: Explore principles of agricultural manufacturing, power, and construction.	
IAFNR 8.1	Identify basic principles and terminology used in agricultural manufacturing, power, and construction.
IAFNR 8.2	Describe the proper safety procedures and equipment.
IAFNR 9: Explore career-planning concepts, tools, and strategies in the agriculture industry.	
IAFNR 9.1	Investigate a variety of careers in agriculture including required skills, education, and typical career paths.
IAFNR 9.2	Demonstrate an understanding of necessary skills needed for a career in the agriculture industry.

Plant Science - 18051	
PS 1: Demonstrate industry-standard safety practices in the plant science industry.	
PS 1.1	Demonstrate safe use and knowledge of tools and equipment in the plant science industry.
PS 1.2	Analyze worksite safety procedures and protocols in the plant science industry.
PS 2: Explain principles of anatomy and physiology in plants.	
PS 2.1	Describe functional differences in plant structures including roots, stems, flowers, and leaves.
PS 2.2	Identify and classify plants into various categories (e.g., monocots, dicots, crop varieties).
PS 2.3	Differentiate plant structures and their purposes.
PS 3: Manipulate the environmental factors to promote optimal growth in plants.	
PS 3.1	Determine nutritional requirements for optimal plant growth.
PS 3.2	Manage soil/medium and nutrients for optimal growth.
PS 3.3	Investigate plant nutritional requirements and growing environments.
PS 4: Evaluate fundamentals of production and harvesting of plants.	
PS 4.1	Analyze a production plan for optimal plant production.
PS 4.2	Explore the basic methods for reproducing and propagating plants.
PS 4.3	Assess the fundamentals to harvest, handle, store, and market crops.
PS 5: Utilize career-planning concepts, tools, and strategies to explore careers in plant science.	
PS 5.1	Investigate a variety of careers in plant science, including required skills, education, and typical career paths.
PS 5.2	Demonstrate an understanding of necessary skills needed for a career in plant science.

Advanced Plant Science - 18057	
ADPS 1: Demonstrate industry-standard safety practices in the plant science industry.	
ADPS 1.1	Demonstrate safe use and knowledge of tools and equipment in the plant science industry.
ADPS 1.2	Analyze worksite safety procedures and protocols in the plant science industry.
ADPS 1.3	Investigate Safety Data Sheets (SDS) to determine the safe handling, mixing, and application of chemicals.
ADPS 2: Recognize principles of plant classification and physiology for the production and management of agronomic plants.	
ADPS 2.1	Classify plants according to taxonomy, life cycles, and plant use.
ADPS 2.2	Apply knowledge of seed, fruit, and vegetative parts optimal for plant reproduction.
ADPS 2.3	Investigate various genetically modified plants (GMOs), including their relationship and impact on the industry.
ADPS 3: Employ the principles and practices of sustainable agriculture in a plant-based operation.	
ADPS 3.1	Summarize the fundamentals of plant management and sustainable agriculture.
ADPS 3.2	Apply the fundamentals of sustainable agriculture within plant science.
ADPS 3.3	Develop an integrated fertilizer plan for specific plants or crops.
ADPS 3.4	Evaluate data to manage both range and pastures.
ADPS 3.5	Evaluate growth of a plant to determine when and how a crop should be harvested and stored.
ADPS 3.6	Evaluate crop and harvest success for future planning.
ADPS 4: Analyze a pest management system.	
ADPS 4.1	Identify primary pests of plants and crops.
ADPS 4.2	Develop integrated pest management strategies to manage pest populations.
ADPS 4.3	Apply safe handling, mixing, and application of chemicals for pest management.
ADPS 4.4	Identify pesticides by formulation and use.
ADPS 5: Utilize career-planning concepts, tools, and strategies to explore careers in plant science.	
ADPS 5.1	Investigate a variety of careers in plant science, including required skills, education, and typical career paths.
ADPS 5.2	Demonstrate an understanding of necessary skills needed for a career in food science.

Fundamental Horticulture -18052	
HORT 1: Demonstrate industry-standard safety practices in the horticulture industry.	
HORT 1.1	Demonstrate safe use and knowledge of tools and equipment used in the horticulture industry.
HORT 1.2	Analyze worksite safety procedures and protocols in the horticulture industry.
HORT 2: Examine horticulture industry sectors.	
HORT 2.1	Investigate the produce industry (e.g., fruits, vegetables, nuts).
HORT 2.2	Investigate the floriculture industry.
HORT 2.3	Investigate the nursery/landscape industry.
HORT 2.4	Investigate the care and management of turfgrass.
HORT 3: Explain horticultural plant classifications.	
HORT 3.1	Identify and classify horticultural plants.
HORT 3.2	Explore the purposes of horticulture plants.
HORT 4: Analyze the basic principles of plant physiology and propagation.	
HORT 4.1	Explain basic principles of plant physiology and growth.
HORT 4.2	Demonstrate the propagation of plants by sexual and asexual methods.
HORT 5: Analyze a pest management system in the horticultural industry.	
HORT 5.1	Identify primary pests of plants and crops.
HORT 5.2	Develop integrated pest management strategies to manage pest populations.
HORT 5.3	Apply safe handling, mixing, and application of chemicals for pest management.
HORT 5.4	Identify pesticides by formulation and use.
HORT 6: Analyze soil, environment, and fertility properties as they affect plant growth.	
HORT 6.1	Examine soil and planting media management.
HORT 6.2	Analyze information about the growing environment and its effect on plant growth.
HORT 6.3	Identify plant nutrition practices for horticulture plants as they relate to plant growth and health.
HORT 6.4	Explore various alternative methods of growing horticultural plants (e.g., aquaponics, hydroponics).

HORT 7: Investigate a variety of specializations within the horticulture industry, including required skills, education, and career paths.	
HORT 7.1	Investigate and examine career opportunities in the plant science industry.
HORT 7.2	Demonstrate an understanding of necessary skills needed for a career in plant science.

Horticulture Operations - 18053	
HOOP 1: Demonstrate industry-standard safety practices in the horticulture industry.	
HOOP 1.1	Demonstrate safe use and knowledge of tools and equipment used in the horticulture industry.
HOOP 1.2	Analyze worksite safety procedures and protocols in the horticulture industry.
HOOP 2: Assess plants, equipment and materials utilized in the horticulture industry.	
HOOP 2.1	Identify and categorize plants by their purpose.
HOOP 2.2	Demonstrate use of supplies and materials used in horticulture.
HOOP 2.3	Apply concepts of plant anatomy and the functions of plant structures to activities associated with plant systems.
HOOP 3: Develop and implement a horticulture management plan.	
HOOP 3.1	Determine the influence of environmental and nutritional factors on plants.
HOOP 3.2	Apply plant management and care practices.
HOOP 3.3	Demonstrate and communicate understanding of specialized growing techniques.
HOOP 4: Apply principles of design in plant systems to enhance an environment.	
HOOP 4.1	Compare plants based on quality and function.
HOOP 4.2	Apply concepts of proper use of plants in their environment.
HOOP 4.3	Create designs using plants.
HOOP 4.4	Evaluate a design and provide feedback and suggestions for improvement.
HOOP 5: Develop a business plan for owning and/or operating a horticulture business.	
HOOP 5.1	Apply concepts of business management to a horticulture business.
HOOP 5.2	Create marketing materials to support a horticulture business plan.
HOOP 6: Investigate a variety of specializations within the horticulture industry, including required skills, education, and career paths.	
HOOP 6.1	Investigate and examine career opportunities in the plant science industry.
HOOP 6.2	Demonstrate an understanding of necessary skills needed for a career in plant sciences.

Fundamental Animal Science - 18101	
FAS 1: Examine the anatomy and physiology of livestock animals.	
FAS 1.1	Recognize and distinguish livestock by species, breed, gender or use.
FAS 1.2	Analyze the parts and functions of internal and external anatomy of livestock.
FAS 2: Demonstrate an understanding of practices that promote safe human and livestock interactions.	
FAS 2.1	Evaluate livestock behavior and determine a strategy to safely work with it.
FAS 2.2	Examine and assess livestock housing, equipment, and handling facilities for the safety of animals and humans.
FAS 2.3	Critique management practices that support environmentally sustainable livestock production.
FAS 3: Analyze livestock health indicators and responses.	
FAS 3.1	Evaluate the essential factors that determine the health status of livestock.
FAS 3.2	Analyze and investigate proper response to poor livestock health and the proper usage and effects of animal health products.
FAS 4: Distinguish elements of proper livestock nutrition.	
FAS 4.1	Compare the differing nutritional needs of livestock throughout its life cycle.
FAS 4.2	Prepare a feed ration according to nutrient requirements.
FAS 5: Analyze the reproductive system of livestock.	
FAS 5.1	Examine and compare male and female reproductive systems.
FAS 5.2	Identify essential elements of breeding soundness and readiness in males.
FAS 5.3	Discuss reproductive cycles and breeding techniques.
FAS 5.4	Define and identify elements of estrus, gestation, and parturition.
FAS 6: Identify factors that affect the performance of livestock.	
FAS 6.1	Assess a livestock operation to determine if an animal has reached its optimum performance level.
FAS 6.2	Recommend management strategies for animals performing at suboptimal level.
FAS 6.3	Predict genetic outcomes.
FAS 7: Examine livestock industry issues.	
FAS 7.1	Define common terminology related to animal welfare.
FAS 7.2	Analyze consumer perceptions related to animal welfare.

FAS 7.3	Compare and contrast consumer concerns related to livestock food products.
FAS 8: Investigate a variety of specializations within the animal science industry, including required skills, education, and career paths.	
FAS 8.1	Investigate and examine career opportunities in the animal science industry.
FAS 8.2	Demonstrate an understanding of necessary skills needed for a career in the animal science industry.

Companion Animals -18102	
CA 1: Examine companion and specialty animal industries.	
CA 1.1	Investigate uses of companion and specialty animals.
CA 1.2	Explore the different industries supporting companion animals.
CA 1.3	Define ethical standards of care for companion and specialty animals.
CA 1.4	Compare and contrast concerns related to companion and specialty animals.
CA 2: Examine the anatomy and physiology of common companion and specialty animals.	
CA 2.1	Identify scientific names and common species-specific terminology relevant to entry-level conversations of common companion and specialty animals.
CA 2.2	Explain the functional differences in anatomy and physiology of companion animals and specialty animals.
CA 2.3	Differentiate between species' reproductive cycles.
CA 3: Evaluate an animal's diet to provide proper nutrition and optimal performance.	
CA 3.1	Evaluate an animal's developmental stage and use it to comprehend differences in nutrient requirements throughout the animal's life cycle.
CA 3.2	Analyze a feed label to determine whether it fulfills a given animal's nutrient requirements.
CA 4: Demonstrate techniques for optimal care of an animal.	
CA 4.1	Recognize optimum performance for a given animal species according to their use.
CA 4.2	Evaluate an animal's behavior to determine a strategy for safe handling.
CA 4.3	Analyze a training plan to meet the needs of a specific animal.
CA 4.4	Examine animal housing, equipment, transport systems, and handling facilities for the safety of animals and handlers.
CA 5: Apply principles of maintaining companion animal health.	
CA 5.1	Determine safe handling strategies for different companion animals.
CA 5.2	Identify common diseases and parasites affecting companion animals.
CA 5.3	Recognize signs and symptoms requiring veterinary care.
CA 5.4	Explain preventative healthcare practices.
CA 5.5	Describe the purpose of vaccination programs and wellness schedules.
CA 6: Assess ownership of specialty and companion animals.	
CA 6.1	Determine the annual cost of needs of a companion animal.
CA 6.2	Compare and contrast different companion animals based on the owner's environment

	and lifestyle.
CA 6.3	Explore the hygiene and grooming needs of different companion animals.
CA 7: Research and analyze how public policy, laws, and advocacy impact companion animals and animal science.	
CA 7.1	Examine laws that shaped animal welfare throughout history.
CA 7.2	Analyze how public policy affects the animal science industry.
CA 8: Investigate a variety of specializations within the animal science industry, including required skills, education, and career paths.	
CA 8.1	Investigate and examine career opportunities in the animal science industry.
CA 8.2	Demonstrate an understanding of necessary skills needed for a career in the animal science industry.

Advanced Animal Science - 18107	
AdAS 1: Demonstrate industry-standard safety practices in the animal science industry.	
AdAS 1.1	Demonstrate safe use and knowledge of tools and equipment used in the animal science industry.
AdAS 1.2	Demonstrate worksite safety procedures and protocols in the animal science industry.
AdAS 2: Assess and analyze proper health care practices for animals.	
AdAS 2.1	Discuss how to provide biosecurity for animals, people, and facilities.
AdAS 2.2	Diagnose prevention and treatment programs for animal diseases, parasites, and disorders.
AdAS 3: Demonstrate proper nutrition management practices to optimize animal performance.	
AdAS 3.1	Assess nutritional elements as they affect animal performance.
AdAS 3.2	Develop feed rations to provide for animals' nutritional needs.
AdAS 4: Select reproductive practices to optimize animal production.	
AdAS 4.1	Identify management practices in breeding that account for high-quality animals.
AdAS 4.2	Compare and contrast different reproductive technologies.
AdAS 5: Articulate medical terminology as it relates to animals.	
AdAS 5.1	Define relevant medical terminology related to animals.
AdAS 5.2	Apply medical terminology in the correct context.
AdAS 6: Classify, evaluate, and select animals based on anatomical and physiological characteristics.	
AdAS 6.1	Apply principles of anatomy and physiology to uses within various animal systems.
AdAS 6.2	Analyze information and make connections pertaining to the interrelatedness of various body systems.
AdAS 7: Utilize principles of veterinary tools and techniques.	
AdAS 7.1	Identify veterinary tools and practices.
AdAS 7.2	Apply proper veterinary techniques to medical situations.
AdAS 8: Research how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.	
AdAS 8.1	Examine laws that shaped animal welfare throughout history.
AdAS 8.2	Analyze how public policy affects the animal science industry.
AdAS 9: Investigate a variety of specializations within the animal science industry, including	

required skills, education, and career paths.	
AdAS 9.1	Investigate and examine career opportunities in the animal science industry.
AdAS 9.2	Demonstrate an understanding of necessary skills needed for a career in the animal science industry.

Agribusiness Sales and Marketing - 18201	
AgSM 1: Develop knowledge and skills to work in agricultural sales.	
AgSM 1.1	Examine terminology related to sales and marketing.
AgSM 1.2	Identify sales and distribution methods (e.g., direct to consumer, retail sales, wholesale, auction).
AgSM 1.3	Demonstrate the steps in the sales process.
AgSM 1.4	Identify ag products, services, and technologies commonly marketed in agriculture.
AgSM 2: Evaluate sales and marketing principles used to accomplish marketing objectives.	
AgSM 2.1	Compare and contrast strategies for the sale and marketing of agricultural goods and services.
AgSM 2.2	Explain budget and forecast models to support business marketing, strategies, and performances.
AgSM 2.3	Merchandise products and services to meet the needs of a customer.
AgSM 2.4	Create a marketing plan for a product based on marketing objectives.
AgSM 3: Use technology and documents to manage agribusiness inventory.	
AgSM 3.1	Compare inventory management methods for various agribusinesses.
AgSM 3.2	Apply inventory management strategies.
AgSM 3.3	Forecast inventory needs to meet market demands.
AgSM 4: Evaluate opportunities for marketing agricultural products and services throughout the world.	
AgSM 4.1	Locate areas of agricultural importance and determine the competitive advantage for production of agricultural products.
AgSM 4.2	Explore issues related to global food production and access.
AgSM 4.3	Explore the international trade markets.
AgSM 4.4	Analyze how processing, branding, marketing, or alternative uses can increase the value of ag products.
AgSM 5: Utilize career-planning concepts, tools, and strategies to explore careers in agribusiness sales and marketing.	
AgSM 5.1	Investigate a variety of careers in agribusiness sales and marketing, including required skills and education.
AgSM 5.2	Demonstrate an understanding of necessary skills needed for a career in agribusiness sales and marketing.

Agribusiness Management - 18202	
AgBM1 1: Explain the components of agribusiness management.	
AgBM1 1.1	Compare and contrast key business structures in agribusiness (e.g., sole enterprise, LLC, partnership, C-corp., Co-op).
AgBM1 1.2	Explain terminology related to agribusiness.
AgBM1 2: Examine laws, policies, and regulations in agribusiness.	
AgBM1 2.1	Identify tax laws and regulations related to agribusiness.
AgBM1 2.2	Identify the purpose and types of contracts used in agribusiness.
AgBM1 2.3	Explore government and private farm programs, policies, and regulations.
AgBM1 3: Investigate agriculture sales and marketing strategies.	
AgBM1 3.1	Explore strategies for the sale and marketing of agricultural goods and services.
AgBM1 3.2	Analyze budget and forecast models to determine optimal business marketing, strategies, and performances.
AgBM1 3.3	Analyze how processing, branding, marketing, or alternative uses can increase the value of ag products.
AgBM1 4: Manage budgets and credit for an agribusiness using appropriate record-keeping and generally accepted accounting principles (GAAP).	
AgBM1 4.1	Use technology and applications for financial practices (e.g., spreadsheet, recording-keeping software, apps).
AgBM1 4.2	Develop, assess, and manage cash budgets to achieve agribusiness goals.
AgBM1 4.3	Analyze credit needs and manage credit budgets to achieve agribusiness goals (e.g., interest rates, compounding interests, loan types, terms).
AgBM1 4.4	Interpret financial statements (example: net- worth, balance sheet, cash flow).
AgBM1 5: Utilize management practices in agribusiness.	
AgBM1 5.1	Use technology and applications for management practices (e.g., spreadsheet and record keeping software, apps, point of sale system, livestock management).
AgBM1 5.2	Forecast inventory needs to meet market demands.
AgBM1 5.3	Explore non-current and capital asset management (e.g., depreciation, repair, replacement).
AgBM1 6: Utilize career-planning concepts, tools, and strategies to explore careers in agribusiness.	
AgBM1 6.1	Investigate a variety of careers in agricultural leadership and communications, including required skills, education, and typical careers.
AgBM1 6.2	Demonstrate an understanding of necessary skills needed for a career in agribusiness.

Advanced Agribusiness Management - 18249	
AgBM2 1: Explore the basics of farm, ranch and agribusiness accounting.	
AgBM2 1.1	Identify the differences between accrual vs cash accounting.
AgBM2 1.2	Demonstrate the use of accounting programs in an agriculture business.
AgBM2 1.3	Explore strategies for the sale of agricultural commodities and products.
AgBM2 1.4	Demonstrate non-current and capital asset management (e.g., depreciation, repair, replacement).
AgBM2 1.5	Apply technology and applications for management practices (spreadsheet and record keeping software, Apps, Point of Sale system, livestock management).
AgBM2 2: Demonstrate key concepts of agriculture economics.	
AgBM2 2.1	Demonstrate key accounting fundamentals.
AgBM2 2.2	Demonstrate key economic principles.
AgBM2 2.3	Explain supply and demand.
AgBM2 2.4	Identify microeconomics vs macroeconomics.
AgBM2 3: Examine laws, policies, and regulations in agribusiness.	
AgBM2 3.1	Analyze tax laws and regulations related to agribusiness.
AgBM2 3.2	Analyze the components of contracts used in agribusiness.
AgBM2 3.3	Compare and contrast government and private farm programs, policies, and regulations.
AgBM2 3.4	Explore the types of bankruptcies.
AgBM2 3.5	Analyze agriculture's role in international trade.
AgBM2 3.6	Explore the implications of environmental regulations.
AgBM2 3.7	Analyze the implications of the Farm Bill.
AgBM2 4: Define commodity marketing.	
AgBM2 4.1	Define futures and options trading.

AgBM2 4.2	Explore grain and livestock marketing strategies.
AgBM2 5: Explore the need for insurance in agriculture.	
AgBM2 5.1	Explore the types and purpose of crop insurance.
AgBM2 5.2	Explore the types and purpose of livestock insurance.
AgBM2 6: Utilize career-planning concepts, tools, and strategies to explore careers in agribusiness.	
AgBM2 6.1	Investigate a variety of careers in agribusiness and management including required skills, education, and typical careers.
AgBM2 6.2	Demonstrate an understanding of necessary skills needed for a career in agribusiness.

Ag Leadership and Communications - 18203	
AgLC 1: Apply and model individual leadership skills in the agriculture industry.	
AgLC 1.1	Identify characteristics of effective leaders in agriculture.
AgLC 1.2	Identify personal leadership strengths and opportunities for growth.
AgLC 1.3	Explore leadership opportunities in the agriculture industry (e.g., Economic Development, County Commissions, Township Boards, State and Federal Government, Boards and commissions: such as Dairy Association, Soybean Commission, Cattleman's, Farmer's Union).
AgLC 2: Apply and model teamwork and leadership skills in an agricultural context.	
AgLC 2.1	Examine leadership styles and approaches in the agriculture industry.
AgLC 2.2	Explore goal setting strategies through collaborative efforts.
AgLC 2.3	Examine leadership styles and approaches to leadership used in industry.
AgLC 2.4	Model proper use of parliamentary procedure.
AgLC 2.5	Build consensus and carry out a project to accomplish results while considering varied audiences in the workplace and community.
AgLC 3: Apply professional feedback practices.	
AgLC 3.1	Practice self-reflection and identify opportunities for growth.
AgLC 3.2	Receive constructive feedback from multiple viewpoints.
AgLC 3.3	Demonstrate professionalism when receiving feedback.
AgLC 3.4	Provide constructive, respectful, and actionable feedback that supports growth and success to others.
AgLC 4: Model integrity, ethical leadership and professional communication.	
AgLC 4.1	Model characteristics of ethical and effective communicators and leaders in the workplace and community.
AgLC 4.2	Implement personal management skills to function effectively and efficiently in the workplace.
AgLC 4.3	Demonstrate behaviors that contribute to positive morale and culture in the workplace and community.
AgLC 4.4	Evaluate ethical dilemmas and determine appropriate courses of action (case studies).
AgLC 4.5	Identify ethical challenges associated with emerging technologies (e.g., artificial intelligence, misinformation, intellectual property, photo consent, privacy, bias).
AgLC 5: Communicate information relevant to agriculture clearly, effectively, and with reason.	
AgLC 5.1	Demonstrate information research skills using credible agriculture industry sources (e.g.,

	United States Department of Agriculture (USDA) data, extension publications).
AgLC 5.2	Evaluate communication strategies across platforms that ensure clarity, logic, purpose, and professionalism.
AgLC 5.3	Produce clear, reasoned, and coherent written, verbal, or visual communication for formal or informal settings.
AgLC 5.4	Implement appropriate style of writing for the situation (e.g., AP style – journalistic needs, APA style – research needs).
AgLC 6: Implement technology to enhance agricultural communications and advocacy.	
AgLC 6.1	Research, select, and use technologies, tools, and applications to produce agricultural communications content.
AgLC 6.2	Utilize technology to advocate for AFNR and/or the FFA.
AgLC 6.4	Develop awareness of digital reputation.
AgLC 7: Utilize career-planning concepts, tools, and strategies to explore careers in agricultural leadership and communications.	
AgLC 7.1	Investigate a variety of careers in agricultural leadership and communications, including required skills, education, and typical career paths.
AgLC 7.2	Demonstrate an understanding of necessary skills needed for a career in agricultural leadership and communications.

Independent Supervised Agriculture Experience (SAE) - 18248	
SAE 1: Explore career-planning concepts, tools, and strategies in the agriculture- industry.	
SAE 1.1	Investigate careers in agriculture including required skills, education, and typical career paths.
SAE 1.2	Demonstrate an understanding of necessary skills needed for a career in the agriculture industry.
SAE 2: Examine the general philosophy and objectives of SAE programs.	
SAE 2.1	Compare and contrast the applications and benefits of different types of SAEs.
SAE 2.2	Select the appropriate type of SAE for a project to build knowledge and skills in a particular agriculture area.
SAE 3: Utilize project management and recordkeeping skills.	
SAE 3.1	Formulate annual SMART goals for the SAE project or placement and apply the concepts of project planning to monitor and evaluate SAE progress.
SAE 3.2	Accurately maintain a prescribed recordkeeping system and apply proper financial record keeping skills as required by the specific project.
SAE 3.3	Utilize records to direct students' future project plans.
SAE 3.4	Complete an FFA award application.
SAE 4: Document skills, competencies, outcomes and efficiencies through your SAE for personal career goals.	
SAE 4.1	Develop personal SMART goals and conduct activities to work toward individual and career development.
SAE 4.2	Identify knowledge and technical skills necessary for selected careers.
SAE 4.3	Describe the SAE activities performed to learn or demonstrate the skills, competencies, outcomes, or efficiencies achieved.
SAE 5: Understand and demonstrate occupational safety and ethics.	
SAE 5.1	Demonstrate appropriate health and safety procedures for activities aligned with SAE project.
SAE 5.2	Identify and discuss occupational ethics, legal responsibilities, and regulatory compliance issues in relation to specific activities and/or careers aligned with SAE projects.
SAE 6: Develop, document, and demonstrate leadership skills.	
SAE 6.1	Exhibit leadership skills needed for careers in the agriculture industry.
SAE 6.2	Engage in youth leadership opportunities to practice and develop effective leadership skills.
SAE 6.3	Describe leadership and community service activities outside of an SAE project.

Ag Processing - 18302	
AgP 1: Demonstrate industry-standard safety practices for processing agricultural products.	
AgP 1.1	Demonstrate safety skills and knowledge of tools and equipment used in processing agricultural products.
AgP 1.2	Analyze worksite safety procedures and protocols used in processing agricultural products.
AgP 2: Explore the structure of food processing industries.	
AgP 2.1	Investigate the evolution of the food processing industries.
AgP 2.2	Discuss safety and sanitation in the food processing industries.
AgP 2.3	Explain how regulatory agencies within food processing industries work to protect consumers.
AgP 3: Examine the structure of agricultural processing industries.	
AgP 3.1	Investigate the evolution of the non-food processing industries.
AgP 3.2	Discuss safety and sanitation within non-food processing industries.
AgP 3.3	Explain how regulatory agencies within non-food processing industries work to protect consumers.
AgP 4: Demonstrate operational procedures used in ag processing industries.	
AgP 4.1	Explain regulatory procedures as they apply to ag processing.
AgP 4.2	Demonstrate safety and sanitation procedures for ag processing equipment.
AgP 4.3	Explore advances in technology associated with ag processing.
AgP 5: Explore processes for ag product storage, distribution, and consumption.	
AgP 5.1	Identify processed ag products.
AgP 5.2	Explore harvesting, selection and inspection techniques used within the industry.
AgP 5.3	Explain the steps involved with producing various ag products.
AgP 5.4	Process ag product safely.
AgP 6: Investigate a variety of specializations within ag processing, including required skills, education, and career paths.	
AgP 6.1	Investigate and examine career opportunities in the ag processing industry.
AgP 6.2	Demonstrate an understanding of necessary skills needed for a career in ag processing.

Ag Biotechnology - 18308	
AgBT 1: Demonstrate industry-standard safety practices within agricultural biotechnology.	
AgBT 1.1	Demonstrate safety skills and knowledge of tools and equipment used within agricultural biotechnology.
AgBT 1.2	Analyze worksite safety procedures and protocols used within agricultural biotechnology.
AgBT 2: Assess factors that have influenced the evolution of biotechnology in agriculture.	
AgBT 2.1	Investigate and explain the relationships among past, current, and emerging applications of biotechnology in agriculture.
AgBT 2.2	Evaluate the scope and implications of regulatory agencies on applications of biotechnology in agriculture and protection of public interests.
AgBT 2.3	Analyze the relationships and implications of bioethics, laws, and public perceptions on applications of biotechnology in agriculture.
AgBT 3: Explore the functions and importance of biotechnology at the cellular level.	
AgBT 3.1	Explain components of cells and their application to genetic improvement within biotechnology.
AgBT 3.2	Examine the components and process of genetic transfer.
AgBT 3.3	Define the role of cell structures in genetic theory.
AgBT 3.4	Explain the role of genetics and cell structures in gene expression.
AgBT 4: Apply safety skills and Standard Operating Procedures (SOPs) to complete tasks in a biotechnology research environment.	
AgBT 4.1	Read, document, evaluate accurate laboratory records of experimental protocols, observations, and results.
AgBT 4.2	Demonstrate safety procedures in a biotechnology research environment.
AgBT 4.3	Implement SOP for the biotechnology sector.
AgBT 5: Analyze the application of biotechnology to solve problems in agriculture systems.	
AgBT 5.1	Investigate biotechnology principles, techniques, and processes to enhance plant systems.
AgBT 5.2	Investigate biotechnology principles, techniques, and processes to enhance animal systems.
AgBT 5.3	Investigate biotechnology principles, techniques, and processes to enhance food products and processing systems.

AgBT 5.4	Investigate biotechnology principles, techniques, and processes to enhance natural resources and environmental service systems.
AgBT 5.5	Investigate the impact of agriculture biotechnology on modern medicine.
AgBT 6: Utilize career-planning concepts, tools, and strategies to explore careers in agriculture biotechnology.	
AgBT 6.1	Investigate a variety of careers in ag biotechnology, including required skills, education, and typical career paths.
AgBT 6.2	Demonstrate an understanding of necessary skills needed for a career in ag biotechnology.

Fundamental Ag Mechanical Technologies - 18401	
AgMT 1: Apply safety practices within a mechanical setting.	
AgMT 1.1	Identify and demonstrate the proper industry safety standards.
AgMT 1.2	Identify and use personal protective equipment (PPE) for the shop and jobsite.
AgMT 1.3	Demonstrate safe use and knowledge of tools and equipment when constructing agriculture mechanics.
AgMT 1.4	Explore Occupation Safety and Health Administration (OSHA) rules and regulations.
AgMT 1.5	
AgMT 2: Utilize measurement, math skills, formulas, and principles in agriculture and aligned industries.	
AgMT 2.1	Read a tape measure to an 1/16 inch.
AgMT 2.2	Use and read appropriate measurement tools.
AgMT 2.3	Apply geometric formulas to determine areas of various structures.
AgMT 2.4	Apply appropriate formulas to determine percentages/decimals.
AgMT 2.5	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
AgMT 2.6	Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.
AgMT 2.7	Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
AgMT 2.8	Define the X,Y,Z coordinates involved in common Computer Numeric Control (CNC) applications.
AgMT 3: Identify maintenance procedures & schedules for mechanical equipment, power, and agricultural technology.	
AgMT 3.1	Identify parts and explain functions of various mechanical systems.
AgMT 3.2	Read and apply information from operating manuals.
AgMT 3.3	Investigate common maintenance schedules and practices for equipment.
AgMT 3.4	Troubleshoot problems in mechanical systems.
AgMT 3.5	Examine power (horsepower, watts, etc.) related to mechanical equipment.
AgMT 4: Examine basic skills in metal fabrication.	
AgMT 4.1	Discuss types and purposes of metal projects.
AgMT 4.2	Explore basic welding and metal cutting principles and techniques.
AgMT 5: Apply mechanical principles in agricultural applications.	

AgMT 5.1	AgMTRecognize the terminology, components, and functions of mechanical systems (electrical, pneumatic, plumbing, hydraulic).
AgMT 5.2	AgMTIdentify tools and materials used in mechanical systems.
AgMT 5.3	AgMTExplore fundamental principles of mechanical systems.
AgMT 6: Investigate emerging agricultural technologies.	
AgMT 6.1	Investigate new and/or existing technology in agriculture.
AgMT 6.2	Explore precision agriculture technologies.
AgMT 6.3	Examine the use of robotics and automation in agriculture.
AgMT 7: Utilize career-planning concepts, tools, and strategies to explore careers in agriculture structures and aligned industries.	
AgMT 7.1	Investigate a variety of careers in agriculture mechanical technologies and aligned industries.
AgMT 7.2	Demonstrate an understanding of necessary skills needed for a career in agriculture mechanical technologies.

Ag Systems Technology - 18402	
AgST 1: Apply safety concepts in agriculture systems technology.	
AgST 1.1	Identify and demonstrate the proper industry safety standards.
AgST 1.2	Apply general safety principles in the shop and on the jobsite.
AgST 1.3	Identify and use personal protective equipment (PPE) for the shop and jobsite.
AgST 1.4	Demonstrate safe use and knowledge of tools and equipment when constructing agriculture mechanics.
AgST 1.5	Explore Occupation Safety and Health Administration (OSHA) rules and regulations.
AgST 2: Utilize measurement, math skills, formulas, and principles in agriculture and aligned industries.	
AgST 2.1	Read a tape measure to 1/16 inch.
AgST 2.2	Select and apply appropriate measurement tools.
AgST 2.3	Apply geometric formulas to determine areas of various structures.
AgST 2.4	Apply appropriate formulas to determine percentages/decimals.
AgST 2.5	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
AgST 2.6	Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.
AgST 3: Apply scientific principles to mechanical equipment, power utilization and technology.	
AgST 3.1	Compare power generation from various energy sources (e.g., electrical, fuels).
AgST 3.2	Investigate various types and properties of lubricants needed in ag mechanics (e.g., oils, grease, transmission fluid).
AgST 3.3	Investigate various types and properties of fluids needed in ag mechanics (e.g., hydraulics. Anti-freeze, brake fluid).
AgST 4: Apply principles of operation to mechanical equipment, power utilization, and technology.	
AST 4.1	Identify components and purpose of agriculture machinery.
AgST 4.2	Demonstrate suggested inspections on machinery and/or equipment.
AST 4.3	Read and apply information from operating manuals.
AgST 5: Examine principles of maintenance, service, and repair to mechanical equipment, power utilization and technology.	
AgST 5.1	Explain the importance of scheduled service routines to maintain machinery and equipment.
AgST 5.2	Evaluate internal and/or diesel combustion engines to assess needed service and repair.

AgST 5.3	Investigate service and repair specifications for operating systems.
AgST 5.4	Diagnose problems associated with operating systems.
AgST 5.5	Explore electric motor types, operation, and maintenance.
AgST 6: Analyze emerging agriculture technologies.	
AgST 6.1	Analyze how emerging agriculture technologies have affected agriculture and aligned industries.
AgST 6.2	Explore automation in the agriculture industry (e.g., greenhouse temperature controls, sensors for water, milking).
AgST 6.3	Explore appropriate uses for artificial intelligence (AI) in the agriculture industry.
AgST 7: Utilize career-planning concepts, tools, and strategies to explore careers in agriculture systems technology and aligned industries.	
AgST 7.1	Investigate a variety of careers in agriculture systems technology and aligned industries including required skills, education, and typical careers.
AgST 7.2	Demonstrate an understanding of necessary skills needed for a career in agriculture systems technology.

Fundamental Ag Structures Technology - 18403	
AgS1 1: Apply safety concepts in agriculture structures.	
AgS1 1.1	Identify and demonstrate the proper industry safety standards.
AgS1 1.2	Apply general safety principles in the shop and on the jobsite.
AgS1 1.3	Identify and use personal protective equipment (PPE) for the shop and jobsite.
AgS1 1.4	Demonstrate safe use and knowledge of tools and equipment when constructing agricultural structures.
AgS1 1.5	Explore Occupation Safety and Health Administration (OSHA) rules and regulations.
AgS1 2: Utilize measurement, math skills, formulas, and principles in agriculture and aligned industries.	
AgS1 2.1	Read a tape measure to an 1/16 inch.
AgS1 2.2	Use and read appropriate measurement tools.
AgS1 2.3	Apply geometric formulas to determine areas of various structures.
AgS1 2.4	Apply appropriate formulas to determine percentages/decimals.
AgS1 2.5	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
AgS1 2.6	Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.
AgS1 2.7	Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
AgS1 2.8	Define the X,Y,Z coordinates involved in common Computer Numeric Control (CNC) applications.
AgS1 3: Analyze properties and conditions of building site prior to construction.	
AgS1 3.1	Explain legal land descriptions and plat maps.
AgS1 3.2	Examine geographical characteristics of building site.
AgS1 3.3	Compare and contrast building sites using home site evaluation principles.
AgS1 3.4	Explore surveying equipment and/or Geographic Information System (GIS) equipment.
AgS1 4: Examine various types of agriculture structures.	
AgS1 4.1	Identify types of agriculture structures.
AgS1 4.2	Identify basic types of flooring systems
AgS1 4.3	Identify basic types of framing for wall and ceiling systems.
AgS1 5: Examine various materials required for an agricultural structure.	

AgS1 5.1	Investigate the differences in materials needed to assemble an ag structure.
AgS1 5.2	Apply knowledge of structural materials by developing a supply list, along with cost estimates for a given project.
AgS1 5.3	Analyze various concrete and masonry concepts (e.g., tools, mixes, concrete block calculations).
AgS1 6: Interpret plans for an agriculture structure.	
AgS1 6.1	Recognize basic drafting and blueprint terms and abbreviations.
AgS1 6.2	Develop a materials list based on a blueprint.
AgS1 7: Construct an agriculture structure.	
AgS1 7.1	Assemble components of a structure.
AgS1 7.2	Assemble an agriculture structure by combining individually constructed components.
AgS1 8: Examine mechanical systems in an agriculture structure.	
AgS1 8.1	Explain basic electrical terms and principles.
AgS1 8.2	Explain plumbing terms and principles.
AgS1 8.3	Explain Heating, Ventilation, and Air Conditioning (HVAC) terms and principles.
AgS1 8.4	Use applicable instruments to demonstrate knowledge of basic mechanical systems.
AgS1 8.5	Demonstrate basic application of mechanical systems (wiring, circuits, plumbing, HVAC).
AgS2 1 9: Utilize career-planning concepts, tools, and strategies to explore careers in agriculture structures and aligned industries.	
AgS1 9.1	Investigate a variety of careers in agriculture structures and aligned industries including required skills, education, and typical careers.
AgS1 9.2	Demonstrate an understanding of necessary skills needed for a career in agriculture structures.

Advanced Ag Structures Technology - 18407	
AgS2 2 1: Apply safety concepts in agriculture structures.	
AgS2 1.1	Demonstrate proper industry safety standards.
AgS2 1.2	Apply general safety principles in the shop and on the jobsite.
AgS2 1.3	Demonstrate proper use of personal protective equipment (PPE) for the shop and jobsite.
AgS2 1.4	Demonstrate safe use and knowledge of tools and equipment when constructing agricultural structures.
AgS2 1.5	Explore Occupation Safety and Health Administration (OSHA) rules and regulations.
AgS2 2: Service and repair mechanical equipment, tools, and structures.	
AgS2 2.1	Analyze schematics to service various systems in an ag structure.
AgS2 2.2	Demonstrate understanding of tool repair and maintenance.
AgS2 3: Create and utilize a structural plan that meets specifications and building codes.	
AgS2 3.1	Examine blueprints and local codes that identify required components of an ag structure.
AgS2 3.2	Utilize industry-based technology or drafting skills to design a structural plan.
AgS2 3.3	Use architectural and mechanical plans to construct agricultural buildings or facilities.
AgS2 4: Utilize a variety of materials for agriculture structure applications.	
AgS2 4.1	Demonstrate concrete and masonry procedures.
AgS2 4.2	Compare and contrast lumber used in agriculture structures (e.g., grades, defects, treatments, types).
AgS2 4.3	Compare and contrast metal used in agriculture structures (e.g., gauge, types, alloy).
AgS2 5: Apply mechanical systems in an agriculture structure.	
AgS2 5.1	Demonstrate electrical principles.
AgS2 5.2	Demonstrate plumbing principles.
AgS2 5.3	Demonstrate Heating, Ventilation, and Air Conditioning (HVAC) principles.
AgS2 5.4	Use applicable instruments to demonstrate knowledge of mechanical systems (e.g., multi-meter, pressure sensors, air flow sensors).
AgS2 6: Utilize career-planning concepts, tools, and strategies to explore careers in agriculture structures and aligned industries.	
AgS2 6.1	Investigate a variety of careers in agriculture structures and aligned industries including required skills, education, and typical careers.
AgS2 6.2	Demonstrate an understanding of necessary skills needed for a career in agriculture structures.

Ag Metal Fabrication - 18404	
AgMF1 1: Apply safety concepts in metal fabrication.	
AgMF1 1.1	Identify and demonstrate the proper industry safety standards.
AgMF1 1.2	Apply general safety principles in the shop and on the jobsite.
AgMF1 1.3	Identify and use personal protective equipment (PPE) for the shop and jobsite.
AgMF1 1.4	Demonstrate safe use and knowledge of tools and equipment when constructing agriculture mechanics.
AgMF1 1.5	Explore Occupation Safety and Health Administration (OSHA) rules and regulations.
AgMF1 2: Utilize measurement, math skills, formulas, and principles in agriculture and aligned industries.	
AgMF1 2.1	Read a tape measure to an 1/16 inch.
AgMF1 2.2	Use and read appropriate measurement tools.
AgMF1 2.3	Apply geometric formulas to determine areas of various structures.
AgMF1 2.4	Apply appropriate formulas to determine percentages/decimals.
AgMF1 2.5	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
AgMF1 2.6	Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.
AgMF1 2.7	Explain a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
AgMF1 2.8	Identify the X,Y,Z coordinates involved in common Computer Numeric Control (CNC) applications.
AgMF1 3: Identify maintenance procedures & schedules for mechanical equipment, power, and agricultural technology.	
AgMF1 3.1	Demonstrate knowledge of metal fabrication terminology, techniques, and related technologies.
AgMF1 3.2	Prepare various metals for welding.
AgMF1 3.3	Draft plans for a metal project utilizing industry technology.
AgMF1 3.4	Create a metal fabrication project.
AgMF1 4: Demonstrate the principles of Shielded Metal Arc Welding (SMAW) and the correct operation of SMAW equipment.	
AgMF1 4.1	Perform Shielded Metal Arc Welding (SMAW) techniques.
AgMF1 5: Demonstrate the principles of Metal Inert Gas (MIG) welding, also known as Gas Metal Arc Welding (GMAW), and the correct operation of MIG equipment.	
AgMF1 5.1	AgMF1Perform metal inert gas (MIG) welding techniques.

AgMF1 6: Describe the correct operation of metal-cutting equipment.	
AgMF1 6.1	Perform oxyacetylene techniques (e.g., welding, cutting, brazing).
AgMF1 6.2	Perform plasma arc cutting (handheld or automated).
AgMF1 7: Explore advanced welding processes.	
AgMF1 7.1	Investigate and explain principles of advanced welding processes (e.g. Tungsten Inert Gas (TIG) welding, plasma tables, CNC, robotics).
AgMF1 8: Utilize career-planning concepts, tools, and strategies to explore careers in metal fabrication industries.	
AgMF1 8.1	Investigate a variety of careers in metal fabrication industries including required skills, education, and typical careers.
AgMF1 8.2	Demonstrate an understanding of necessary skills needed for a career in agriculture mechanical technologies.

Advanced Ag Metal Fabrication - 18405	
AgMF2 1: Apply safety concepts in metal fabrication.	
AgMF2 1.1	Demonstrate the proper industry safety standards in the shop and jobsite
AgMF2 1.2	Demonstrate the proper use of personal protective equipment (PPE) for the shop and jobsite.
AgMF2 1.3	Demonstrate safe use and knowledge, tools, and equipment when working with agriculture mechanics.
AgMF2 1.4	Explore and apply Occupation Safety and Health Administration (OSHA) rules and regulations.
AgMF2 2: Utilize measurement, math skills, formulas, and principles in agriculture and aligned industries.	
AgMF2 2.1	Read tape measure to an 1/16 inch.
AgMF2 2.2	Use and read appropriate measurement tools.
AgMF2 2.3	Apply geometric formulas to determine areas of various structures.
AgMF2 2.4	Apply appropriate formulas to determine percentages/decimals.
AgMF2 2.5	Analyze appropriate formulas to determine ratios, fractions, and proportion measures.
AgMF2 2.6	Analyze formulas to determine measurement of dimensions, spaces, and structures.
AgMF2 3: Explore certifications in metal fabrication.	
AgMF2 3.1	Identify possible certifications (e.g., American Welding Society (AWS), American National Standards Institute (ANSI), etc.).
AgMF2 3.2	Explore the requirements and benefits of various certifications.
AgMF2 3.3	Demonstrate knowledge and skills necessary for certification.
AgMF2 4: Interpret drawing and welding symbol information.	
AgMF2 4.1	Identify basic weld symbols and joints.
AgMF2 4.2	Read and sketch drawings.
AgMF2 4.3	Apply welding symbols in context.
AgMF2 5: Perform other advanced cutting processes.	
AgMF2 5.1	Identify and explain the safety, parts, and operation of thermal cutting equipment.
AgMF2 5.2	Prepare layouts for cutting individual parts.
AgMF2 5.3	Perform cuts using thermal cutting processes.

AgMF2 5.4	Utilized advanced processes to perform cuts (Computer Numeric Control (CNC)).
AgMF2 6: Perform Gas Metal Arc Welding (GMAW) process.	
AgMF2 6.1	Identify and understand the safety, parts, and operation of GMAW.
AgMF2 6.2	Prepare various base metals for welding processes.
AgMF2 6.3	Demonstrate Gas Metal Arc Welding (GMAW) on various metals.
AgMF2 7: Perform Gas Tungsten Arc Welding (GTAW) process.	
AgMF2 7.1	Identify and understand the safety, parts, and operation of GTAW.
AgMF2 7.2	Identify proper electrode and filler for base material.
AgMF2 7.3	Prepare various base metals for welding processes.
AgMF2 7.4	Demonstrate GTAWon various metals.
AgMF2 8: Perform other advanced welding processes.	
AgMF2 8.1	Identify and understand the safety, parts, and operation of another advanced welding process.
AgMF2 8.2	Prepare base metal for various welding processes.
AgMF2 8.3	Demonstrate another advanced welding process on steel.
AgMF2 8.4	Explore robotics and emerging technologies' role in welding fabrication.
AgMF2 9: Identify and demonstrate knowledge of the inspection of welding and cutting processes.	
AgMF2 9.1	Visually inspect a weld.
AgMF2 9.2	Examine thermally cut surfaces and edges for discontinuities.
AgMF2 10: Utilize career-planning concepts, tools, and strategies to explore careers in metal fabrication industries.	
AgMF2 10.1	Investigate a variety of careers in metal fabrication industries including required skills, education, and typical careers.
AgMF2 10.2	Demonstrate an understanding of necessary skills needed for a career in metal fabrication.

Cross Cluster Standards also connected with the Agriculture Cluster	
Primary Cluster	**Course**
Hospitality, Tourism, and Events	Food Science and Technology – 19254
Energy and Natural Resources	Wildlife and Fisheries - 18501
Energy and Natural Resources	Natural Resources -18504
Energy and Natural Resources	Advanced Natural Resources – 18502
Energy and Natural Resources	Issues in Environmental Science – 18508
Architecture and Construction	Construction Equipment I – 17990
Architecture and Construction	Construction Equipment II – 17991
Supply Chain and Transportation	Diesel Technology – 20107
Supply Chain and Transportation	Introduction to CDL Theory - 20999

SEQUENCE OF COURSES

ARCHITECTURE AND CONSTRUCTION

BUILDING AND MOVING

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APPROVED CLUSTER COURSES

CONSTRUCTION PATHWAY

- 17006 Introduction to Architecture & Construction
- 21051 Introduction to Technology Skills and Application
- 17007 Finish Carpentry I
- 17005 Finish Carpentry II
- 17002 Construction Trades I
- 17003 Construction Trades II
- 17990 Construction Equipment I
- 17991 Construction Equipment II
- 17992 Construction Equipment III
- 17057 Building Systems and Infastructure
- 20999 Introduction to CDL

DESIGN AND PRE-CONSTRUCTION PATHWAY

- 17006 Introduction to Architecutre & Construction
- 21051 Introduction to Technology Skills and Application
- 17990 Construction Equipment I
- 17991 Construction Equipment II
- 17992 Construction Equipment III
- 21102 Fundamentals of Drafting and Design
- 21103 Architectural Drafting and Design
- 17057 Building Systems and Infastructure
- 20999 Introduction to CDL Theory

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Architecture and Construction

The Architecture and Construction Career Cluster includes professions that design, plan, manage, and build the spaces where people live, work, and gather. It highlights the importance of sustainable building practices so that structures remain safe, environmentally responsible, and resilient for years to come. From architects and engineers to construction managers, skilled tradespeople, preconstruction specialists, drafters, heavy equipment operators, and mechanical system technicians, this cluster leads to skills for careers that will create the buildings and homes of the future.

Introduction to Architecture and Construction - 17006	
IAC 1: Explore the different career opportunities involved in the architecture and construction industries.	
IAC 1.1	Research career opportunities and their interconnectedness in the four subclusters: architecture and engineering, construction planning and development, equipment maintenance and operation, and building systems and services.
IAC 1.2	Examine educational and industry requirements for employment in the architecture and construction fields.
IAC 2: Introduce safety concepts in the architecture and construction industries.	
IAC 2.1	Apply general safety principles in the shop and on the jobsite.
IAC 2.2	Identify and use personal protective equipment (PPE) in the shop and on the jobsite.
IAC 2.3	Define Occupational Safety Health Administration (OSHA) and its role in the construction industries.
IAC 2.4	Apply general hand and power tool safety procedures.
IAC 3: Apply basic math principles used in the architecture and construction industries.	
IAC 3.1	Demonstrate proper use of relevant math skills.
IAC 3.2	Demonstrate proper measuring and layout skills.
IAC 4: Recognize the materials used in the architecture and construction industries.	
IAC 4.1	Identify wood species, lumber, and engineered building materials.
IAC 4.2	Recognize proper application of fasteners, adhesives, and hardware.
IAC 4.3	Explore new and emerging materials used in the building industry.
IAC 5: Examine basic drafting skills used in architecture and construction.	
IAC 5.1	Recognize basic drafting terms and abbreviations.
IAC 5.2	Differentiate between drafting methods in the construction industry.
IAC 6: Examine the construction processes.	
IAC 6.1	Differentiate between preconstruction, construction, and postconstruction processes.

IAC 6.2	Investigate related trades in construction systems (e.g., electrical, plumbing, HVAC).
IAC 7: Demonstrate skills needed in architecture and construction industries.	
IAC 7.1	Apply proper measuring and cutting techniques to perform job-related tasks.
IAC 7.2	Display a working knowledge of tools and equipment used in the industry.
IAC 7.3	Construct a project using the assigned design process.

Construction Trades I - 17002	
CTI 1: Understand and apply industry safety procedures.	
CTI 1.1	Identify and demonstrate the proper industry safety standards.
CTI 1.2	Explore Occupational Safety Health Administration (OSHA) rules and regulations.
CTI 1.3	Interpret building code regulations to residential and commercial construction projects.
CTI 2: Utilize appropriate industry math skills and formulas.	
CTI 2.1	Understand and demonstrate relevant math skills and formulas used in the construction industry.
CTI 2.2	Estimate construction material quantities.
CTI 3: Identify and correctly use appropriate hand, power, and pneumatic tools.	
CTI 3.1	Demonstrate safe and proper use of hand tools.
CTI 3.2	Demonstrate safe and proper use of power tools.
CTI 3.3	Demonstrate safe and proper use of pneumatic tools.
CTI 4: Understand blueprint reading and basic survey techniques.	
CTI 4.1	Demonstrate how to read blueprints.
CTI 4.2	Demonstrate basic survey techniques.
CTI 4.3	Interpret a site plan and understand preparation methods.
CTI 5: Apply basic organizational, spatial, structural, and construction principles of carpentry.	
CTI 5.1	Understand the connection between preconstruction, construction, and postconstruction phases.
CTI 5.2	Demonstrate the building process by completing a construction project.
CTI 6: Employ basic knowledge and methods of concrete technology.	
CTI 6.1	Identify safe practices associated with concrete materials.
CTI 6.2	Calculate the various required ingredients used in concrete.
CTI 6.3	Evaluate the uses of concrete in various applications.
CTI 7: Apply foundation framing principles in the construction of floor, wall, ceiling, and roofing systems.	
CTI 7.1	Identify the components and functions of floor, wall, ceiling, roof framing systems.
CTI 7.2	Interpret construction plans and layout measurements to prepare for framing projects
CTI 7.3	Construct floor, wall, ceiling, and roof framing assemblies using appropriate materials, tools, and safe work practices.

CTI 8: Study principles, standards and applications of mechanical, electrical, and plumbing.	
CTI 8.1	Define safety procedures for mechanical, electrical, and plumbing.
CTI 8.2	Identify relevant mechanical systems used in construction projects.
CTI 8.3	Identify relevant plumbing materials used in construction projects.
CTI 8.4	Demonstrate the use of plumbing materials.
CTI 8.5	Identify relevant electrical materials used in construction projects.
CTI 9: Explore the different career opportunities in construction trades and related industries.	
CTI 9.1	Research career opportunities in residential and commercial construction and related industries.
CTI 9.2	Examine educational and industry requirements for employment in the construction trade industry.

Construction Trades II - 17003	
CTII 1: Apply industry safety procedures.	
CTII 1.1	Demonstrate proper industry safety standards.
CTII 1.2	Explain Occupational Safety Health Administration (OSHA) rules and regulations.
CTII 1.3	Apply building code regulations to residential and commercial construction projects.
CTII 2: Utilize appropriate industry math skills and formulas.	
CTII 2.1	Apply relevant math skills and formulas used in the construction industry.
CTII 2.2	Estimate construction material quantities and costs.
CTII 3: Apply concepts of blueprint reading and perform basic survey techniques.	
CTII 3.1	Build a construction project based on blueprints.
CTII 3.2	Demonstrate survey techniques and site layout.
CTII 4: Identify and understand building materials, fasteners, and adhesives.	
CTII 4.1	Understand and demonstrate the use of building materials.
CTII 4.2	Understand and demonstrate the use of fasteners and adhesives.
CTII 5: Use appropriate hand, power and pneumatic tools.	
CTII 5.1	Apply safe and proper use of hand tools.
CTII 5.2	Apply safe and proper use of power tools.
CTII 5.3	Apply safe and proper use of pneumatic tools.
CTII 6: Integrate concrete technology to achieve construction background.	
CTII 6.1	Select the appropriate concrete materials for a construction project.
CTII 6.2	Select the uses of concrete and reinforcing materials.
CTII 6.3	Estimate the costs of concrete materials for a project.
CTII 7: Perform framing of flooring, wall, ceiling, and roofing systems.	
CTII 7.1	Demonstrate advanced framing of flooring systems.
CTII 7.2	Demonstrate advanced framing of wall and ceiling systems.
CTII 7.3	Understand and demonstrate the framing of a roofing system.
CTII 8: Identify and perform different exterior systems and finishing methods.	
CTII 8.1	Understand and demonstrate installation of exterior finishes.
CTII 8.2	Understand and demonstrate installation of windows.

CTII 8.3	Understand and demonstrate installation of exterior doors.
CTII 8.4	Understand and demonstrate installation of thermal and moisture protection wall systems.
CTII 9: Identify and understand different roofing applications.	
CTII 9.1	Understand and demonstrate installation of roofing materials.
CTII 9.2	Understand and demonstrate installation of thermal and moisture protection for roofing and attic spaces.
CTII 10: Identify and perform different interior systems and finishing methods.	
CTII 10.1	Understand and demonstrate drywall installation.
CTII 10.2	Understand and demonstrate drywall finishing.
CTII 10.3	Understand and demonstrate interior finishing.
CTII 10.4	Understand basic cabinet design and installation.
CTII 11: Understand and demonstrate installation of stairs.	
CTII 11.1	Identify the various types and parts of stairs.
CTII 11.2	Using appropriate math formulas, calculate the number and sizes of risers and treads for a stairway.
CTII 11.3	Layout and cut stringers.
CTII 12: Demonstrate the principles and standards of residential mechanical, electrical, and plumbing applications.	
CTII 12.1	Explore and explain the use of mechanical systems.
CTII 12.2	Demonstrate the use of electrical materials.
CTII 12.3	Demonstrate the use of plumbing materials.
CTII 12.4	Investigate how public utilities work with mechanical, electrical, and plumbing (MEP) systems in construction.
CTII 13: Participate in career exploration activities.	
CTII 13.1	Compare and contrast career opportunities in residential and commercial construction.

Finish Carpentry I - 17007	
FCI 1: Observe and apply rules and regulations to comply with personal and lab/shop safety.	
FCI 1.1	Apply hand/power tool and lab/shop safety standards.
FCI 1.2	Describe and wear appropriate personal protective equipment (PPE) when needed.
FCI 1.3	Indicate a knowledge of government regulations regarding health and safety in the lab/shop.
FCI 2: Apply basic math principles used in the architecture and construction industries.	
FCI 2.1	Demonstrate proper use of appropriate math skills.
FCI 2.2	Demonstrate an understanding of the difference between board feet, linear feet, and square feet.
FCI 2.3	Demonstrate proper measuring and layout skills.
FCI 3: Identify various materials and apply project planning.	
FCI 3.1	Identify wood species and engineered materials.
FCI 3.2	Analyze design elements of a project plan.
FCI 3.3	Create and implement a bill of materials and cut list from a project drawing.
FCI 3.4	Identify various types of hardware, fasteners, and adhesives used in the finish carpentry industry.
FCI 4: Demonstrate various finish carpentry joinery and assembly techniques.	
FCI 4.1	Demonstrate basic common joinery techniques.
FCI 4.2	Demonstrate knowledge of industry concepts to assemble projects.
FCI 5: Recognize and apply surface preparation and finishing techniques.	
FCI 5.1	Apply surface preparation techniques.
FCI 5.2	Apply finishing products.
FCI 6: Explore the different career opportunities in finish carpentry.	
FCI 6.1	Research career opportunities in residential and commercial finish carpentry and related industries.
FCI 6.2	Examine educational and industry requirements for employment in residential and commercial finish carpentry and related industries.

Finish Carpentry II - 17005	
FCII 1: Demonstrate proper rules and regulations to comply with personal and lab/shop safety.	
FCII 1.1	Apply hand/power/industrial tool and lab/shop safety practices.
FCII 1.2	Identify and utilize appropriate personal protective equipment (PPE).
FCII 1.3	Comply with government regulations regarding health and safety in the lab/shop.
FCII 2: Evaluate career opportunities with the carpentry industry.	
FCII 2.1	Explore career opportunities in residential and commercial areas.
FCII 2.2	Compare education and training available for carpentry (e.g., apprenticeships, technical colleges, and universities).
FCII 2.3	Identify industry recognized credentials that are useful in the field of carpentry.
FCII 3: Utilize advanced math skills, formulas, and principles used in finish carpentry.	
FCII 3.1	Apply geometric formulas to determine areas of various structures.
FCII 3.2	Apply appropriate formulas to determine percentages/decimals.
FCII 3.3	Apply appropriate formulas to determine ratios, fractions, and proportion measures.
FCII 3.4	Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.
FCII 3.5	Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.
FCII 3.6	Define the X, Y, Z coordinates involved in common computer numeric control (CNC) applications.
FCII 4: Identify various materials and evaluate the proper application in project planning.	
FCII 4.1	Differentiate various finish carpentry materials and their appropriate applications.
FCII 4.2	Identify the common grades of lumber and sheet goods.
FCII 4.3	Describe and identify natural defects in woods.
FCII 4.4	Understand and utilize proper storage and handling techniques.
FCII 4.5	Create a project plan, bill of materials, cut list and timeline.
FCII 5: Demonstrate advanced skills and techniques used in industry.	
FCII 5.1	Determine plumb, level, and square.
FCII 5.2	Demonstrate proper techniques used in various sawing, shaping, carving, molding, and routing applications.
FCII 5.3	Differentiate and apply various fabricating techniques and styles in casework, millwork, and molding.
FCII 5.4	Identify and create wood and mechanical joints used in finish carpentry.

FCII 6: Demonstrate the use of finish carpentry fasteners and hardware.	
FCII 6.1	Demonstrate proper application and use of hardware, mechanical fasteners, and adhesives.
FCII 6.2	Analyze different hardware, mechanical fasteners, and adhesives and their applications.
FCII 7: Demonstrate proper assembly and finish preparation techniques.	
FCII 7.1	Develop logical assembly process/procedure.
FCII 7.2	Demonstrate various ways to remove excess adhesive.
FCII 7.3	Apply surface preparation techniques.
FCII 8: Demonstrate the use of finishing materials and processes.	
FCII 8.1	Explain the purpose and application of various types of finishes and finishing processes.
FCII 8.2	Utilize safe and approved methods for cleanup and disposal (e.g., Occupational Safety Health Administration (OSHA), U.S. Environmental Protection Agency (EPA), and Department of Environment and Natural Resources (DENR)).

Construction Equipment I - 17990	
CEI 1: Construction Equipment Safety	
CEI 1.1	Explain the importance of safety when working with construction equipment.
CEI 1.2	State the purpose of signs, tags, barricades, and lockout/tagout devices used on construction sites.
CEI 1.3	Describe the long and short-term health effects, first-aid measures, handling, and storage, and/or required personal protective equipment (PPE).
CEI 1.4	Identify safeguards used in a highway construction work zone.
CEI 1.5	State the general guidelines for safe operation, maintenance, and transportation of construction equipment.
CEI 1.6	Explain the dangers of working around an excavation area with construction equipment.
CEI 1.7	Describe the importance of safety data sheets (SDS).
CEI 2: Orientation to the trade	
CEI 2.1	Explain the basic terminology, types, and uses of construction equipment.
CEI 2.2	Compare education and training available for heavy equipment operation (e.g., apprenticeships, technical colleges, and universities).
CEI 3: Identify the components and functionality of equipment.	
CEI 3.1	Explain the function of heavy equipment components.
CEI 3.2	Explain the operations of various components.
CEI 3.3	Identify the corresponding function of components.
CEI 4: Equipment Operation	
CEI 4.1	Identify the control of operations of heavy equipment.
CEI 4.2	Identify and describe instruments and specialized control systems in heavy equipment.
CEI 4.3	Explain start-up, shut-down, and operating procedures for heavy equipment.
CEI 5: Equipment Usage/Application	
CEI 5.1	Analyze equipment needed for the job.
CEI 5.2	Evaluate equipment usage and choices.
CEI 5.3	List task-related work activities for heavy equipment.
CEI 5.4	Explore basic maintenance practices for heavy equipment.
CEI 6: FORKLIFTS-Students understand and perform, where possible, lifting, transporting, and placement forklift operations with a focus on safety.	
CEI 6.1	Identify the components of forklifts.

CEI 6.2	Explain the operations of various components.
CEI 6.3	Describe preventive maintenance procedures.
CEI 6.4	Describe startup and operating procedures for forklifts.
CEI 7: ON-ROAD DUMP TRUCKS-Students understand and perform, where possible, appropriate operations using on-road dump trucks.	
CEI 7.1	Identify the various types of on-road dump trucks.
CEI 7.2	Identify and describe instruments and specialized control systems in dump trucks.
CEI 7.3	List the operator inspection and maintenance requirements.
CEI 7.4	Explain safe driving practices for dump trucks.
CEI 7.5	Perform basic operations using a dump truck.
CEI 8: SKID STEER-Students understand and perform, where applicable, usage and proper functionality of skid steers.	
CEI 8.1	Describe the pre-start inspection requirements for skid steers.
CEI 8.2	Describe the startup, shutdown, and operations procedures for skid steers.
CEI 9: INTERPRETING CIVIL DRAWINGS-Students read and interpret construction site drawings to perform operations.	
CEI 9.1	Read and interpret drawings.
CEI 9.2	Define common abbreviations.
CEI 9.3	Describe how as-built drawings are prepared.
CEI 10: EQUIPMENT OPERATIONS-Students understand and perform, where applicable, operations on various pieces of heavy equipment to demonstrate proper startup, shut-off, and maintenance procedures for each piece of machinery.	
CEI 10.1	Describe pre-start inspection requirements for various pieces of machinery.
CEI 10.2	List task-related work activities.

Construction Equipment II – 17991	
CEII 1: Develop professional knowledge and safe work habits for construction related careers.	
CEII 1.1	Identify career opportunities available to construction equipment operators and explain the purpose and objectives of an apprentice training program.
CEII 1.2	Explain the responsibilities and characteristics of a good operator.
CEII 1.3	Explain the importance of construction equipment safety.
CEII 1.4	Describe preventive maintenance procedures.
CEII 2: Identify and evaluate construction equipment and its appropriate uses.	
CEII 2.1	Explain the terminology, types, and uses of equipment.
CEII 2.2	Examine various types of specialized equipment.
CEII 2.3	Explore uses of supportive equipment.
CEII 3: Apply excavation mathematics to construction equipment operation.	
CEII 3.1	Explain and demonstrate the correct use of formulas for site layout.
CEII 3.2	Understand the proper sequence of operations in a formula.
CEII 3.3	Demonstrate understanding of different types of angles.
CEII 3.4	Demonstrate how to calculate/estimate area and volume.
CEII 4: Analyze site conditions, grades, and soils to support construction projects.	
CEII 4.1	Explore plans for site layout.
CEII 4.2	Explore topography of the land.
CEII 4.3	Explore soil classification systems and soil conditions.
CEII 4.4	Read survey stakes.

Construction Equipment III – 17992	
CEIII 1: Perform advanced construction equipment operating procedures.	
CEIII 1.1	Conduct pre and post-inspections on construction equipment.
CEIII 1.2	Identify different systems of construction equipment and the purpose of each system.
CEIII 1.3	Explain safety hazards and procedures for construction equipment.
CEIII 2: Plan and execute earth-moving operations using appropriate construction equipment.	
CEIII 2.1	Plan earth-moving activities for various types of construction projects.
CEIII 2.2	Identify appropriate construction equipment needed for the earth-moving task or project.
CEIII 3: Interpreting civil drawings to support construction projects.	
CEIII 3.1	Create site plans.
CEIII 3.2	Calculate site plans.
CEIII 3.3	Develop a plan of action based on civil drawings.
CEIII 4: Perform finishing and grading operations using industry standards.	
CEIII 4.1	Implement finishing procedures for a project.
CEIII 4.2	Select materials and methods to stabilize soils.
CEIII 4.3	Utilize erosion control processes.

Fundamentals of Drafting and Design - 21102	
DDI 1: Examine basic drafting terminology and equipment.	
DDI 1.1	Recognize basic drafting terms and abbreviations.
DDI 1.2	Differentiate between manual, computer-aided design (CAD) and building information modeling (BIM) drafting tools and their uses.
DDI 2: Apply basic math skills to design work.	
DDI 2.1	Apply mathematical formulas used in drafting and design.
DDI 2.2	Understand the concept of drawing scales used in drafting.
DDI 3: Examine basic drafting fundamentals and technical skills.	
DDI 3.1	Integrate symbols, lettering and geometric shapes used on technical drawings.
DDI 3.2	Illustrate line types recommended by American National Standards Institute (ANSI).
DDI 3.3	Define dimensioning styles and techniques on metric and imperial drawings.
DDI 4: Apply drawing techniques to produce various technical plans.	
DDI 4.1	Create orthographic projections.
DDI 4.2	Create isometric and pictorial drawings.
DDI 5: Implement CAD software into design work.	
DDI 5.1	Identify CAD skills and applications of technical design.
DDI 5.2	Apply CAD defaults and preferences to set up a drawing.
DDI 5.3	Generate drawings and projections using CAD software.
DDI 6: Explore career-ready practices.	
DDI 6.1	Examine careers in architectural and mechanical drafting.
DDI 6.2	Compare career possibilities in the drafting industry.

Architectural Drafting and Design - 21103	
DDII 1: Understand architectural design fundamentals and history.	
DDII 1.1	Identify architectural products and styles throughout history.
DDII 1.2	Interpret the fundamentals of framing plans.
DDII 1.3	Identify building codes and governing bodies.
DDII 1.4	Identify residential building materials.
DDII 2: Understand drawing management, dimensioning, and annotations.	
DDII 2.1	Examine drawing identification and management techniques used in architectural drafting.
DDII 2.2	Illustrate proper dimensioning and annotation practices used in architectural drafting.
DDII 3: Implement building information modeling (BIM) and computer-assisted design (CAD).	
DDII 3.1	Understand the concept of BIM related to architectural design.
DDII 3.2	Demonstrate use of CAD for architectural design.
DDII 4: Evaluate a residential plot and develop a foundation system plan.	
DDII 4.1	Evaluate a plot/site plan for a residence.
DDII 4.2	Develop a foundation plan for a residence.
DDII 5: Generate the necessary construction plans to build a residence.	
DDII 5.1	Develop a floor plan using accepted symbols and techniques.
DDII 5.2	Prepare a sketch of the residence HVAC, lights and electrical needs.
DDII 5.3	Design a residential roof plan.
DDII 5.4	Demonstrate use of elevations in the design of a residence.
DDII 5.5	Draw interior and exterior stair details appropriate to those found in a residence.
DDII 5.6	Develop door, window, and finishing schedules.
DDII 5.7	Practice basic estimating practices used in the construction industry.
DDII 5.8	Generate final presentation drawings and three-dimensional computer model.

Building Systems and Infrastructure - 17057	
BSIM 1: Apply personal and industry safety practices.	
BSIM 1.1	Implement knowledge of chemical measuring, mixing, and safety.
BSIM 1.2	Demonstrate knowledge of chemical terminology.
BSIM 1.3	Demonstrate knowledge and proper use of safety data sheets (SDS).
BSIM 1.4	Identify codes and regulations that impact facilities management and maintenance.
BSIM 1.5	Prepare for regular safety inspections.
BSIM 2: Utilize tools, equipment, and materials used in construction sub-contractor specialties.	
BSIM 2.1	Identify industry terminology related to building systems.
BSIM 2.2	Identify common technician tools, equipment, and materials.
BSIM 2.3	Utilize tools for their intended purposes.
BSIM 3: Apply measurement, mathematical principals, and calculations to building systems.	
BSIM 3.1	Understand conversions and their application to building systems.
BSIM 3.2	Utilize Ohm's law and its application.
BSIM 4: Interpret technical drawings, schematics, and manuals used in building systems.	
BSIM 4.1	Interpret technical schematics.
BSIM 4.2	Identify system components and location.
BSIM 4.3	Utilize technical manuals to maintain equipment.
BSIM 4.4	Identify common methods of troubleshooting.
BSIM 5: Evaluate, operate, and troubleshoot heating, ventilation, and air conditioning systems (HVAC).	
BSIM 5.1	Discuss essential HVAC components and their functions.
BSIM 5.2	Identify specialized HVAC systems needed for specific industries.
BSIM 5.3	Compare and contrast HVAC systems needed in facilities.
BSIM 5.4	Explain effective management of HVAC systems and costs.
BSIM 5.5	Implement troubleshooting of HVAC systems.
BSIM 6: Electrical	
BSIM 6.1	Identify the utility services (single-phase, three-phase), connections, and electrical panels needed in facilities.

BSIM 6.2	Demonstrate safe handling of electrical systems (e.g., lock-out, tag-out).
BSIM 6.3	Demonstrate the ability to troubleshoot and repair/replace outlets, wiring, switches, fuses and fixtures.
BSIM 7: Apply plumbing principles used in building systems.	
BSIM 7.1	Identify components of water supply and drainage systems.
BSIM 7.2	Discuss water flow.
BSIM 7.3	Analyze essential plumbing components and their functions.
BSIM 7.4	Demonstrate the ability to perform plumbing maintenance (e.g., replace/repair/install plumbing accessories).
BSIM 7.5	Demonstrate the ability to locate and repair leaks in pipes and lines.
BSIM 8: Evaluate security and safety systems.	
BSIM 8.1	Identify systems needed for facilities (e.g., fire suppression, building security, CO2).
BSIM 8.2	Demonstrate the ability to locate building shut-offs.
BSIM 8.3	Explore required inspections and maintenance of safety equipment.
BSIM 9: Explore career opportunities within the subcontractor specialties of the construction industry.	
BSIM 9.1	Research career opportunities in residential and commercial construction related industries (e.g, electrical, plumbing, landscaping, security, mechanical0.
BSIM 9.2	Compare education and training available for careers in building systems. (e.g., apprenticeships, technical colleges, and universities).

SEQUENCE OF COURSES

ARTS, ENTERTAINMENT AND DESIGN

CREATING AND EXPERIENCING



south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

DIGITAL DESIGN & PRODUCTION PATHWAY
11001 Intro to Arts, Entertainment, and Design
05162 Visual Media Design
10203 Multimedia Design
10207 Digital Animation
11054 Photography I
11052 Photography II
11056 Digital Audio Production
11103 Broadcasting Technology
11106 Journalistic Design
11151 Media Production
11153 Content Creation, Branding, and Media
11154 Graphic Design II
11155 Graphic Design I

APPAREL & INTERIOR DESIGN PATHWAY
11001 Intro to Arts, Entertainment, and Design
19201 Fashion Design
19205 Interior Design I
19206 Interior Design II

MIDDLE SCHOOL COURSES

- 19000 Grades 5-8 Family and Consumer Science
- 22000 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Arts, Entertainment, and Design

The Arts, Entertainment, and Design Career Cluster provides students with opportunities to explore careers in the creative industries while developing technical, artistic, and professional skills. Students apply design principles, communication strategies, and industry-standard technologies to create visual, audio, and multimedia projects for authentic audiences and purposes. Coursework emphasizes creativity, critical thinking, collaboration, ethical and legal practices, and project management.

Introduction to Arts, Entertainment, and Design - 11001	
IAED 1: Understand opportunities within arts, entertainment, and design.	
IAED 1.1	Investigate career opportunities in arts, entertainment, and design occupations.
IAED 1.2	Explore historically significant events in arts, entertainment, and design industry.
IAED 2: Demonstrate proper usage of tools in the arts, entertainment, and design field.	
IAED 2.1	Use hardware associated with the career field.
IAED 2.2	Utilize equipment in a proper and safe manner.
IAED 2.3	Use software specific to the career field.
IAED 2.4	Use appropriate terminology specific to the career field.
IAED 3: Examine the responsibilities associated with digital communication and media	
IAED 3.1	Differentiate media messages based on the purpose of the message.
IAED 3.2	Explore laws and ethics in media.
IAED 3.3	Integrate personal responsibility into technological forms of communication.
IAED 4: Examine the elements and principles of design.	
IAED 4.1	Examine the elements of design and their impact on art and/or media.
IAED 4.2	Analyze the principles of design and their impact on art and/or media.
IAED 4.3	Examine the influence of typography on design.
IAED 5: Demonstrate application of professional skills and knowledge.	
IAED 5.1	Using an area of expertise, create a work of self-expression within a selected project.
IAED 5.2	Apply course concepts in industry-based collaboration.

Visual Media Design -05162	
VMD 1: Explore careers in visual media design.	
VMD 1.1	Demonstrate knowledge of the careers available in the visual design industry.
VMD 1.2	Examine and critique composition of professional portfolios.
VMD 2: Apply elements of art and principles of design.	
VMD 2.1	Utilize elements of art in visual communications.
VMD 2.2	Utilize the principles of design in visual communications.
VMD 3: Demonstrate effective use of typography.	
VMD 3.1	Identify common typography terminology used in typography.
VMD 3.2	Explore the use, application, and psychological impact of typography in visual communication.
VMD 4: Utilize methods and materials used in visual media design.	
VMD 4.1	Explore methods used in two-dimensional (2D) and three-dimensional (3D) visual communications.
VMD 4.2	Explore materials used in 2D and 3D visual communications.
VMD 4.3	Explore emerging techniques and technology in visual communications.
VMD 4.4	Create visual communications media.
VMD 5: Demonstrate safe practice and ethics in visual media design.	
VMD 5.1	Demonstrate safe practices in a work environment.
VMD 5.2	Define legal issues and their impact on visual communications and creators.
VMD 5.3	Practice correct copyright usage.

Multimedia Design - 10203	
MD 1: Explore career opportunities in multimedia.	
MD 1.1	Investigate career opportunities in multimedia.
MD 1.2	Identify knowledge, skills and abilities needed for multimedia careers.
MD 2: Explore fundamentals within multimedia collaboration.	
MD 2.1	Interpret use of multimedia in everyday life.
MD 2.2	Explore and examine the various mediums of multi-media design.
MD 2.3	Demonstrate appropriate use of multimedia tools.
MD 2.4	Apply proper operation and maintenance procedures for equipment.
MD 3: Organize multimedia projects for an intended purpose and audience.	
MD 3.1	Outline client requirements.
MD 3.2	Construct a multimedia plan.
MD 3.3	Categorize project tasks into tools, techniques and personnel.
MD 4: Create a multimedia project based on client needs and current industry standards.	
MD 4.1	Construct multimedia projects based on developed plans.
MD 4.2	Critique multimedia presentations.

Digital Animation - 10207	
DA 1: Develop an awareness of career opportunities and professionalism in digital animation.	
DA 1.1	Identify personal interests and abilities related to digital animation careers.
DA 1.2	Investigate career opportunities, trends, and requirements related to digital animation careers.
DA 1.3	Explore legal and ethical issues related to digital animation.
DA 2: Understand and apply the fundamental principles of animation for effective animated works.	
DA 2.1	Explore the 12 principles of animation.
DA 2.2	Apply the 12 principles of animation.
DA 3: Demonstrate basic digital animation skills.	
DA 3.1	Understand design process for use in animation.
DA 3.2	Create clips using animation software tools.
DA 3.3	Implement a pre-production plan.
DA 3.4	Analyze and critique animation production.
DA 4: Apply industry-standard practices to create digital designs and animations.	
DA 4.1	Produce basic animation.
DA 4.2	Generate audio in animation.
DA 4.3	Design user interface and interactivity in animations.
DA 4.4	Evaluate and analyze animations for publication.

Photography I - 11054	
P1 1: Explore opportunities in photographic arts.	
P1 1.1	Explore career opportunities in the area of photography and photojournalism.
P1 1.2	Identify basic resources commonly used in the photography industry.
P1 2: Examine fundamentals related to photographic arts.	
P1 2.1	Classify digital cameras and accessories for intended use.
P1 2.2	Explore digital darkroom management practices.
P1 2.3	Differentiate legal and copyright issues related to photography and photojournalism.
P1 3: Analyze camera operations.	
P1 3.1	Implement appropriate care, maintenance, and safety related to the operation of a
P1 3.2	Analyze and demonstrate the effect of exposure on the quality of photographs.
P1 3.3	Analyze how techniques impact the quality of photographs.
P1 3.4	Examine the exposure triangle and how it is applied.
P1 4: Evaluate photographs for effective composition.	
P1 4.1	Apply principles and elements of design to composition.
P1 4.2	Critique photographs for effective use of the elements of composition.
P1 4.3	Apply light and color settings to produce effective photographs.
P1 5: Create artistic photographs.	
P1 5.1	Implement the use of image editing software for manipulation of photographs.
P1 5.2	Produce photographs for visual display.
P1 5.3	Create a portfolio of photographs that illustrates each of the elements of composition.

Photography II - 11052	
P1 1: Explore opportunities in professional photography.	
P1 1.1	Plan for employment and entrepreneurial opportunities in the professional photography industry.
P1 1.2	Utilize resources commonly used in the photography industry.
P1 2: Exhibit legal and ethical conduct.	
P1 2.1	Evaluate professional codes of conduct.
P1 2.2	Demonstrate personal professionalism.
P1 3: Evaluate photographic techniques.	
P1 3.1	Analyze how the combination of camera settings and desired aesthetics influence the creation of a photograph.
P1 3.2	Evaluate how camera accessories are used to enhance photographic output.
P1 3.3	Demonstrate proficiency in using advanced lighting techniques.
P1 4: Evaluate photographs for effective composition.	
P1 4.1	Apply professional aesthetics to compositional elements in photographs.
P1 4.2	Use professional standards in critiquing photographs.
P1 5: Create commercial photographic products.	
P1 5.1	Demonstrate proficiency in industry standard software.
P1 5.2	Critique photographs to meet client needs.
P1 5.3	Demonstrate use of evaluation techniques for professional portfolios.

Graphic Design I - 11155	
GD1 1: Explore career opportunities and professionalism in graphic design.	
GD1 1.1	Identify personal interests and abilities related to graphic design careers.
GD1 1.2	Investigate career opportunities, trends and requirements related to graphic design careers.
GD1 1.3	Explore legal and ethical issues related to graphic design.
GD1 1.4	Apply Americans with Disabilities Act (ADA) compliance in graphic design.
GD1 2: Apply foundational graphic design concepts related to visual communication and color systems.	
GD1 2.1	Employ color theory.
GD1 2.2	Implement the principles and elements of design.
GD1 2.3	Implement typography techniques.
GD1 2.4	Investigate page layout techniques.
GD1 2.5	Differentiate two-dimensional (2D) and three-dimensional (3D) graphic design concepts.
GD1 2.6	Examine the importance of clear communication through graphic design.
GD1 3: Explore the design process.	
GD1 3.1	Compare and contrast mediums impact on design.
GD1 3.2	Select appropriate mediums for project needs.
GD1 4: Create graphic designs.	
GD1 4.1	Implement hardware and software utilized in graphic design.
GD1 4.2	Create graphic design products for use in a portfolio.

Graphic Design II - 11154	
GD2 1: Develop an awareness of career opportunities and professionalism in graphic design.	
GD2 1.1	Evaluate growth in abilities and skills related to graphic design careers.
GD2 1.2	Investigate career opportunities, emerging technologies and requirements related to graphic design careers.
GD2 1.3	Critique legal and ethical issues related to graphic design.
GD2 1.4	Apply Americans with Disabilities Act (ADA) compliance in graphic design.
GD2 2: Design a graphic media project.	
GD2 2.1	Utilize graphic design fundamentals.
GD2 2.2	Use industry standard tools to create graphic media.
GD2 2.3	Implement industry workflow to design a project for a purpose.
GD2 2.4	Interpret project constraints and client needs.
GD2 3: Produce a graphic media product.	
GD2 3.1	Evaluate types of materials for various graphic design products.
GD2 3.2	Publish printed or digital media.
GD2 4: Curate and present design work professionally.	
GD2 4.1	Build and revise a portfolio demonstrating technical skills in graphic design.
GD2 4.2	Present design work utilizing professional standards.

Broadcast Technology - 11103	
BT 1: Explore career opportunities in the broadcast field.	
BT 1.1	Analyze and evaluate various careers in the broadcast field.
BT 1.2	Identify personal interests and abilities related to the broadcast field.
BT 2: Demonstrate proper use and terminology of broadcast equipment and practices.	
BT 2.1	Demonstrate understanding of industry terminology.
BT 2.2	Execute proper use of broadcast equipment.
BT 2.3	Distinguish broadcast journalism laws and ethics (e.g., copyright, first amendment, AI).
BT 2.4	Identify safety concerns and in the field of broadcast journalism.
BT 2.5	Demonstrate professional communication, collaboration, and workplace behaviors used in broadcasting.
BT 3: Compare and contrast broadcasts.	
BT 3.1	Analyze professional and student created broadcasts.
BT 3.2	Evaluate effectiveness of professional and student created broadcasts.
BT 4: Create and refine original broadcast production.	
BT 4.1	Produce a media project using broadcasting tools and terminology.
BT 4.2	Critique original broadcast content and use information for revision.

Media Production - 11151	
MP 1: Develop an awareness of career opportunities in media production.	
MP 1.1	Identify personal interests and abilities related to media production careers.
MP 1.2	Investigate career opportunities, trends and requirements related to media production careers.
MP 1.3	Reflect on how emerging technology will impact individual learning and career goals, including the importance of adaptability and continuous learning.
MP 2: Evaluate validity, credibility, and bias of information in media.	
MP 2.1	Evaluate various media sources.
MP 2.2	Categorize digital media communication.
MP 2.3	Describe and apply principles of media law.
MP 3: Exhibit basic skills in operating production equipment.	
MP 3.1	Identify commonly used equipment in production.
MP 3.2	Demonstrate skills and safety procedures used in video production.
MP 4: Produce media for distribution using phases of production.	
MP 4.1	Develop a script for production.
MP 4.2	Connect production plans, techniques and roles.
MP 4.3	Utilize production plan to capture raw media footage.
MP 4.4	Produce a final media project using editing software.
MP 4.5	Prepare finished production for distribution via desired medium.
MP 4.6	Critique and refine production.

Journalistic Design – 11106	
JD 1: Explore career opportunities within journalism.	
JD 1.1	Investigate career opportunities.
JD 1.2	Explain skills needed for journalism.
JD 2: Explore and practice the skills of journalistic communication.	
JD 2.1	Identify styles and standards of journalistic writing.
JD 2.2	Analyze publishing writing styles.
JD 2.3	Demonstrate appropriate interview skills.
JD 2.4	Analyze the ethical issues in journalistic communication (e.g., AI, plagiarism).
JD 3: Analyze and apply design components of journalism.	
JD 3.1	Identify elements and principles of design.
JD 3.2	Analyze effectiveness of typography used in design.
JD 3.3	Analyze the impact of design and layout.
JD 3.4	Apply layout and typography techniques.
JD 4: Apply journalistic principles and ethical fundamentals.	
JD 4.1	Explain legal and ethical issues related to publication and broadcast.
JD 4.2	Demonstrate responsible use of information, images, and media.
JD 5: Apply journalism and broadcast software and hardware.	
JD 5.1	Investigate journalism and broadcast software and hardware.
JD 5.2	Create and modify visual content to meet publication needs.
JD 6: Explore and apply photography and videography techniques.	
JD 6.1	Investigate characteristics of composition.
JD 6.2	Explore camera settings and equipment to obtain desired images.
JD 6.3	Apply photography and videography techniques to create media content.
JD 7: Produce media for journalistic purposes.	
JD 7.1	Plan out design process.
JD 7.2	Create production piece.

JD 7.3	Critique and refine production piece.

Digital Audio Production - 11056	
DAPDAP 1: Discuss careers in digital audio production.	
DAP 1.1	Identify opportunities and occupations in the field of digital audio (e.g., music production, audio engineering, podcasting, broadcasting, film, gaming, live sound, voice-over).
DAP 1.2	Examine legal and ethical issues (e.g., copyright laws, licensing, AI-generated audio).
DAP 1.3	Reflect on how emerging technology will impact this career field, including the importance of adaptability and continuous learning.
DAP 2: Analyze digital audio production equipment & software.	
DAP 2.1	Examine the process of basic sound recording and capturing.
DAP 2.2	Analyze recorded, live , and computer-generated audio and sound effects for technical and aesthetic quality.
DAP 3: Create digital audio products.	
DAP 3.1	Record and edit narration, music, and sound effects.
DAP 3.2	Distinguish appropriate audio production software, equipment, and techniques.
DAP 3.3	Generate audio (music, sound effects, vocal work) for a variety of uses.
DAP 4: Finalize and publish digital audio productions.	
DAP 4.1	Evaluate digital audio productions.
DAP 4.2	Revise and enhance productions based on feedback.
DAP 4.3	Prepare and publish completed projects for an intended audience or platform.

Content Creation, Branding, and Media- 11153	
1: Explore career opportunities and industry expectations in visual communications, digital production, and interactive media.	
1.1	Identify personal interests, strengths, and abilities related to careers in visual communications, digital production, and interactive media.
1.2	Investigate trends, opportunities, and related skills across media and entertainment fields.
1.3	Evaluate the impact of emerging technologies and the importance of adaptability and continuous learning.
2: Demonstrate legal, ethical, and professional responsibility when creating and distributing media.	
2.1	Apply copyright, licensing, and fair-use principles when developing media content.
2.2	Demonstrate responsible and ethical use of digital content, technology, and data.
2.3	Identify expectations of professional conduct within media, design, and entertainment industries.
3: Apply foundational design concepts to create visually effective and engaging media.	
3.1	Analyze elements and principles of design in visual and interactive media.
3.2	Apply design principles to develop effective compositions and user-focused visuals.
3.3	Explore foundational concepts of entertainment design, interactive art, and visual storytelling.
4: Create and refine visual, photographic, video, and multimedia content using industry-related tools.	
4.1	Utilize digital tools to create images, graphics, and media assets.
4.2	Utilize industry-standard software to edit and enhance digital images.
4.3	Demonstrate proper camera operation and image capture techniques.
4.4	Capture, edit, and publish video and multimedia content for intended audiences and platforms.
4.5	Identify storytelling strategies (e.g., images, graphics, video, audio, text, etc.).
5: Create and manage brand assets that support consistent and purposeful visual communication.	
5.1	Analyze the components of successful brands and visual identities.
5.2	Design brand materials that support a cohesive and recognizable message across media platforms.

5.3	Apply design strategies that align branding with audience expectations and platform requirements.
6: Apply systematic planning, workflows, and organizational strategies to media production.	
6.1	Plan media projects through storyboarding, procedural development, and timeline creation.
6.2	Design and manage digital production components and project resources.
6.3	Adapt content to meet specific audience needs, platform specifications, and distribution standards.
7: Demonstrate understanding using digital media tools and evaluate emerging production technologies.	
7.1	Utilize industry-relevant media creation software, digital production tools, and interactive development environments.
7.2	Identify appropriate technologies to achieve project goals.
7.3	Compare advantages and limitations of artificial intelligence (AI) within the media and entertainment industries.

Fashion Design - 19201	
FD 1: Explore career opportunities in the fashion industry.	
FD 1.1	Research career opportunities and pathways in fashion design and related industries.
FD 1.2	Analyze industry standard skills needed in the fashion design industry.
FD 2: Analyze the relationship between history and fashion.	
FD 2.1	Interpret the influences of art and media on fashion.
FD 2.2	Differentiate how politics, society, economics, culture, and aesthetics influence fashion.
FD 3: Evaluate performance characteristics of textiles and textile products.	
FD 3.1	Classify clothing details used to recognize, understand, and interpret fashion.
FD 3.2	Evaluate fibers, yarns, fabrics and finishes for end use.
FD 4: Demonstrate fashion design skills.	
FD 4.1	Create fashion designs incorporating the elements and principles of design.
FD 4.2	Critique how color theory and color forecasting impact fashion design.
FD 4.3	Create a fashion line.

Interior Design I - 19205	
ID1 1: Explore career opportunities and professional practices in interior design.	
ID1 1.1	Research career opportunities and pathways in interior design.
ID1 1.2	Analyze industry standard skills needed in interior design.
ID1 2: Analyze the relationship between history and current trends in interior design.	
ID1 2.1	Explain the influence of history on interior design.
ID1 2.2	Describe current trends in the interior design profession.
ID1 3: Apply design elements and principles in interior design.	
ID1 3.1	Analyze the effect and application of elements of design in interior design.
ID1 3.2	Analyze the effect and application of principles of design in interior design.
ID1 4: Investigate design and function of interior spaces.	
ID1 4.1	Demonstrate space and floor planning skills.
ID1 4.2	Examine floor plans, elevation drawings and scale drawings for interior space.
ID1 5: Critique items used in creating interior environments.	
ID1 5.1	Compare characteristics of the components of the interior environments.
ID1 5.2	Distinguish key features of architectural structural elements.
ID1 5.3	Formulate guidelines for selection of furniture.
ID1 6: Apply Interior design project and presentation skills.	
ID1 6.1	Analyze clients' needs.
ID1 6.2	Describe the basic components of project budgets used in interior design proposals.
ID1 6.3	Present interior design proposal to clients.

Interior Design II - 19206	
ID2 1: Analyze opportunities and professional practices in interior design.	
ID2 1.1	Investigate employment and entrepreneurial endeavors in interior design.
ID2 1.2	Describe credentials and licensing requirements for interior designers.
ID2 1.3	Critique professional codes of ethics.
ID2 2: Investigate safe and sustainable practices in the interior design profession.	
ID2 2.1	Demonstrate personal and environmental safety practices.
ID2 2.2	Describe Occupational Safety and Health Administration (OSHA) policies and regulations related to the interior design profession.
ID2 2.3	Integrate sustainable and universal design practices.
ID2 2.4	Explain regulations and public policy that affect interior design.
ID2 3: Differentiate residential interior design and commercial interior design.	
ID2 3.1	Compare and contrast the fields of residential interior design and commercial interior design.
ID2 3.2	Compare space planning techniques and practices for commercial interior design and residential interior design.
ID2 4: Investigate design processes and project management.	
ID2 4.1	Apply the design process to interior design scenarios.
ID2 4.2	Identify the designer's role in successful project management.
ID2 4.3	Create a plan to meet proposal requirements.

SEQUENCE OF COURSES

DIGITAL TECHNOLOGY

INVESTING IN THE FUTURE



south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

NETWORKING AND CYBERSECURITY PATHWAY	PROGRAMMING, WEB, AND SOFTWARE PATHWAY
10003 Introduction to Digital Technology	10003 Introduction to Digital Technology
10013 Computer Science Essentials	10013 Computer Science Essentials
10015 Computer Science Principles	10015 Computer Science Principles
10016 Foundations of Cybersecurity	10019 AP Computer Science Principles
10019 AP Computer Science Principles	10052 Computer Programming I
10101 Network Technology	10153 Software Solutions
10108 Introduction to Artificial Intelligence	10057 AP Computer Science A
10157 AP Computer Science A	10201 Web Development
10251 Computer Hardware	10202 Advanced Web Development
14157 Introduction to Health Informatics	10251 Computer Hardware
17106 Electronics	21009 Robotics
10023 AP Networking	
10024 AP Cybersecurity	

MIDDLE SCHOOL COURSES

- 10001 Grades 5-8 Computer Applications
- 10604 Grades 5-8 Computer Science
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Digital Technology

The Digital Technology Career Cluster focuses on developing digital systems for communication and data storage using critical technologies such as artificial intelligence (AI), data analytics, and cybersecurity. This cluster builds skills necessary for all careers to navigate and lead in the constantly evolving tech landscape and drives innovation across all industries to tackle complex challenges and opportunities in communities and economies.

Introduction to Digital Technology - 10003	
IDT 1: Analyze the need and impact of technology.	
IDT 1.1	Distinguish between appropriate uses of personal electronic devices and computers in educational and professional contexts.
IDT 1.2	Explore the positive impact of digital technology on society.
IDT 1.3	Compare and contrast how digital technology is used both personally and professionally.
IDT 1.4	Investigate physical and mental health dangers associated with digital technology.
IDT 2: Analyze computer hardware required to meet specific needs.	
IDT 2.1	Explore the evolution of the history of computer hardware.
IDT 2.2	Identify and describe hardware components and their relationship to computer usage.
IDT 2.3	Differentiate between different types of memory and storage.
IDT 2.4	Identify input and output devices to meet the needs of users.
IDT 2.5	Apply the decision-making process to purchasing digital technology devices.
IDT 3: Examine software solutions.	
IDT 3.1	Explain how software is created, distributed, installed, and maintained.
IDT 3.2	Describe the functions of system software and operating systems.
IDT 3.3	Compare software solutions to determine the most appropriate application for user needs.
IDT 3.4	Apply tools for developing software applications.
IDT 3.5	Demonstrate knowledge of programming structures.
IDT 4: Investigate technology used for the Internet.	
IDT 4.1	Describe the evolution of the Internet.
IDT 4.2	Explain how technologies, including hardware, protocols, and software, work together to enable internet connectivity and communication.
IDT 4.3	Describe safe and responsible practices for internet use.

IDT 4.4	Identify and compare common types of networking hardware and connectivity (e.g., wired (router, modem, switch) and wireless technologies).
IDT 5: Explore cybersecurity, associated crimes, and defense strategies.	
IDT 5.1	Describe methods of keeping digital technology secure (e.g., passwords, encryption, and best practices for security).
IDT 5.2	Discuss and analyze the threats facing digital technology (e.g., malware, phishing, hackers, and software scams).
IDT 5.3	Discuss and analyze the defenses for securing digital technology such as VPN, firewalls, and multi-factor authentication (MFA).
IDT 6: Understand ethical considerations and societal impacts of technology.	
IDT 6.1	Critique the positive and negative impacts of social media.
IDT 6.2	Explain data privacy and security concerns involving technology.
IDT 6.3	Evaluate ethical issues related to digital technology.
IDT 7: Explore careers in digital technology.	
IDT 7.1	Identify skills, interests, and abilities related to digital technology.
IDT 7.2	Compare personal interest survey results with digital technology occupations.
IDT 7.3	Research labor market information for careers in digital technology.
IDT 7.4	Demonstrate necessary job skills needed for digital technology industries.
IDT 8: Explore artificial intelligence (AI) and its implications on society.	
IDT 8.1	Discuss future trends and the evolving role of AI in society and technology careers.
IDT 8.2	Explore practical uses of AI and its functionality.
IDT 8.3	Apply ethical practices to using AI.

Computer Science I – Essentials - 10013	
CS-I 1: Investigate the impacts of computer science on society.	
CS-I 1.1	Explore ways that computers and technology have changed the way we live, work, and communicate.
CS-I 1.2	Explain how computer programs can show unfair or biased information and its impact through tools like algorithms and ads.
CS-I 1.3	Explore how technology allows people to connect and how that has changed the connectivity of the global workplace.
CS-I 1.4	Explore privacy concerns and intellectual property laws related to technology.
CS-I 1.5	Examine software licenses, including copyright, freeware, and open-source licensing.
CS-I 2: Explore computer components and their functions.	
CS-I 2.1	Identify the main components of a computer system such as CPU, memory, storage, input/output devices and describe their roles.
CS-I 2.2	Compare different types of computer systems such as desktops, laptops, mobile devices, servers and how their functions vary by use case.
CS-I 2.3	Explain how hardware and software work together to perform tasks within a computer system.
CS-I 3: Explore how data moves through networks and how to keep it secure	
CS-I 3.1	Explain how routers, switches, and servers work together to send information.
CS-I 3.2	Describe how viruses and other attacks can steal or damage private information.
CS-I 3.3	Critique ways to protect information and keep it safe.
CS-I 3.4	Discuss the pros and cons of different security tools on ease of use and impact on system operation.
CS-I 4: Explore how data is processed and stored.	
CS-I 4.1	Explore how computers convert binary information, such as bits and code, into letters, numbers, and pictures.
CS-I 4.2	Compare and contrast methods of organizing and storing data hard drives, external drives, cloud storage.
CS-I 5: Recognize and define algorithms and programming concepts and describe how they are used to solve problems and perform tasks in computing.	
CS-I 5.1	Explore various coding environments (IDEs) and their impact on how the code works and looks (syntax).
CS-I 5.2	Identify problems in code through debugging syntax or logic errors.
CS-I 5.3	Explain the purpose of gathering feedback within the design process.
CS-I 5.4	Identify ways to evaluate computer programs for intended outcomes.
CS-I 6: Explore careers in computer science.	

CS-I 6.1	Identify skills, interests, and abilities related to computer science.
CS-I 6.2	Compare personal interest inventory (SDMyLife) results with the skills, interests, and abilities needed for a career in computer science.
CS-I 6.3	Research labor market information for careers in computer science.

Computer Science II – Principles - 10015	
CS-II 1: Investigate the impacts of computer science on society.	
CS-II 1.1	Evaluate the evolving role of computing technologies in transforming modern society.
CS-II 1.2	Evaluate ethical concerns in software development.
CS-II 1.3	Research and analyze laws and regulations that impact the development and use of software.
CS-II 2: Analyze the structure and function of computer systems.	
CS-II 2.1	Explore how computer systems hide complex details to make personal electronic devices easier to use.
CS-II 2.2	Analyze how different layers of a computer system (hardware, system software, and apps) work together.
CS-II 2.3	Demonstrate the ability to create and execute systematic troubleshooting strategies for efficient issue resolution.
CS-II 3: Examine networks and the Internet.	
CS-II 3.1	Describe the factors that impact the speed and reliability of a network such as bandwidth, traffic, setup.
CS-II 3.2	Predict how sensitive data can be affected by viruses, malware, and other cyber-attacks.
CS-II 3.3	Recommend ways to protect digital information using the CIA Triad: confidentiality, integrity, and availability.
CS-II 3.4	Recommend various security measures, considering tradeoffs between the usability and security of a computing system.
CS-II 4: Assess how data is processed and stored.	
CS-II 4.1	Explore how computers convert binary information, such as bits and code, into letters, numbers, and pictures.
CS-II 4.2	Compare and contrast methods of organizing and storing data.
CS-II 5: Formulate and evaluate algorithms and programming solutions and assess how they are used to solve problems in computing.	
CS-II 5.1	Evaluate algorithms in terms of their efficiency, correctness, and clarity.
CS-II 5.2	Compare and contrast fundamental data structures and their uses.
CS-II 5.3	Recommend specific control structures and identify tradeoffs involving implementation, readability, and program performance.
CS-II 5.4	Solve complex problems by breaking them into procedural, modular, or object-oriented components.
CS-II 5.5	Construct solutions to problems based on user feedback.
CS-II 5.6	Plan and develop programs for different audiences.
CS-II 5.7	Investigate and compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.

CS-II 5.8	Compare and contrast AI-generated and human-created code.
CS-II 5.9	Demonstrate appropriate and ethical use of AI-generated code.
CS-II 6: Investigate careers in computer science.	
CS-II 6.1	Research a specific field of computer science and the training or education required, including dual enrollment.
CS-II 6.2	Evaluate personal interests, skills, and learning preferences to identify alignment with careers in computer science, recognize potential skill gaps, and develop an action plan to strengthen readiness for those careers.
CS-II 6.3	Establish connections with industry professionals in the field of computer science.

Computer Programming - 10152	
CP 1: Identify and use a programming environment.	
CP 1.1	Demonstrate knowledge of software concepts like compiler, IDE, programming languages.
CP 1.2	Demonstrate the ability to compile, debug, and execute programs.
CP 1.3	Compare and contrast programming languages and their industry uses.
CP 2: Utilize language fundamentals and proper syntax to create software programs.	
CP 2.1	Identify the parts of a program, including syntax elements and structure.
CP 2.2	Demonstrate the ability to use a programming language, such as Python, Java, or C++.
CP 2.3	Apply the software development processes (planning, designing, coding, and testing).
CP 2.4	Employ basic arithmetic expressions in programs.
CP 2.5	Demonstrate the ability to use data types in programs.
CP 2.6	Incorporate functions/methods.
CP 3: Apply control structures.	
CP 3.1	Demonstrate the ability to use relational and logical operators in programs.
CP 3.2	Apply and construct conditional statements.
CP 3.3	Develop and incorporate loops in programs.
CP 4: Explore career opportunities in programming and software engineering industries.	
CP 4.1	Identify personal interests and abilities related to computer programming and software engineering careers.
CP 4.2	Investigate career opportunities, trends, and requirements related to computer programming/software engineering careers.
CP 4.3	Demonstrate job skills for computer programming/software engineering careers.

Introduction to Artificial Intelligence - 10108	
IAI 1: Understand artificial intelligence (AI) systems and their functionality.	
IAI 1.1	Define AI, including the origins of artificial intelligence.
IAI 1.2	Explore the various types of AI and their underlying technologies such as machine learning (ML), artificial neural networks (ANNs), Large Language Models (LLMs), Generative Pre-trained Transformers (GPTs), and Generative Adversarial Networks (GANs).
IAI 1.3	Differentiate between types of machine learning: supervised learning (using labeled data) and unsupervised learning (finding patterns in unlabeled data).
IAI 1.4	Explore the role of AI in creativity, forecasting, and decision-making, balancing its strengths with ethical considerations.
IAI 2: Explore ethical implications and societal impact of AI.	
IAI 2.1	Investigate and identify biases inherent in AI systems and training data.
IAI 2.2	Evaluate the impact of AI-generated content on information landscapes.
IAI 2.3	Consider the environmental costs of large-scale AI technologies.
IAI 2.4	Evaluate AI-generated outputs, identifying bias, misinformation, and hallucinations.
IAI 2.5	Explore both positive and negative implications of AI on the workforce.
IAI 3: Apply human judgment to critically assess AI-generated content.	
IAI 3.1	Critically assess the accuracy and reliability of AI-generated content.
IAI 3.2	Apply human judgment to evaluate if and how it is appropriate to integrate AI outputs or predictions in personal and academic contexts.
IAI 4: Understand data privacy, security, and intellectual property in relation to AI.	
IAI 4.1	Understand data privacy and security principles related to AI, including how personal information is collected, used, and shared by AI systems, and how to control settings to protect data privacy.
IAI 4.2	Identify the responsibilities of individual users in protecting their own data.
IAI 5: Investigate responsible and creative interaction with AI tools.	
IAI 5.1	Investigate prompt engineering techniques to generate desired outputs.
IAI 5.2	Compare different prompts designed to produce the same output and evaluate which is most effective and why.
IAI 5.3	Identify characteristics of effective prompts, such as clarity, specificity, and structure.
IAI 6: Analyze the impact of AI on the evolving landscape of learning and work.	
IAI 6.1	Analyze how AI impacts traditional learning and assessment methods.
IAI 6.2	Investigate how AI is changing job roles across industries and creating new career opportunities.

IAI 6.3	Reflect on how AI will impact individual learning and career goals, including the importance of adaptability and continuous learning.
IAI 6.4	Investigate career opportunities, trends, and requirements related to data sciences and artificial intelligence.

Foundations of Cybersecurity - 10016	
CYB 1: Explore core cybersecurity concepts.	
CYB 1.1	Explore the importance of cybersecurity.
CYB 1.2	Analyze how personal data can be compromised and strategies for protecting it.
CYB 1.3	Identify how technology professionals use cybersecurity to keep their systems and information safe. Eg. businesses, governments, schools.
CYB 2: Examine elements of cybersecurity, including threats, protections, and trust-building mechanisms in digital systems.	
CYB 2.1	Describe how encryption and secure protocols work and how they keeps data safe.
CYB 2.2	Investigate how organizations utilize security systems to protect their data and networks.
CYB 2.3	Compare and contrast the security of public versus private Wi-Fi.
CYB 2.4	Explore processes that maintain the integrity of data.
CYB 2.5	Investigate data breaches and their long-term impact on business and consumers.
CYB 2.6	Recommend ways to protect digital information using the CIA Triad: confidentiality, integrity, and availability.
CYB 2.7	Compare different security methods and decide when it's more important to keep things secure or easy to use.
CYB 2.8	Explain how poor digital hygiene (e.g., weak passwords, outdated software) increases security risk.
CYB 3: Recognize potential cybersecurity risks and threats.	
CYB 3.1	Define threats, vulnerabilities, and attacks.
CYB 3.2	Implement adversarial role-play to understand how systems can be compromised or breached.
CYB 3.3	Describe common security-related software vulnerabilities.
CYB 3.4	Explore common cyber threats and social engineering techniques. Eg. phishing or fake messages.
CYB 4: Examine cybersecurity ethics and laws, and the legal consequences.	
CYB 4.1	Compare and contrast ethical versus non-ethical hacking.
CYB 4.2	Summarize confidentiality and the role it plays in cybersecurity.
CYB 4.3	Analyze how unethical or illegal hacking jeopardizes safety, finances, and privacy.

Network Technology - 10101	
NT 1: Demonstrate knowledge of designing and implementing a networking system.	
NT 1.1	Demonstrate knowledge of basic network communications, classifications, topologies, and common network hardware.
NT 1.2	Apply knowledge of local area network (LAN) physical media.
NT 1.3	Describe common communication protocols and standards.
NT 1.4	Plan, design, and create network architecture.
NT 1.5	Explain Network Operating Systems (NOS).
NT 1.6	Demonstrate proper handling, storage, and labeling of hardware and cabling to ensure a clean, safe, and efficient work environment.
NT 2: Perform network operating system installation and configuration.	
NT 2.1	Install a network operating system in a physical or virtual environment.
NT 2.2	Configure a network operating system.
NT 2.3	Troubleshoot and resolve network problems.
NT 3: Apply knowledge of network security systems.	
NT 3.1	Evaluate current security policies and procedures, including acceptable use and data protection protocols.
NT 3.2	Apply proper procedures for securing a network.
NT 3.3	Demonstrate penetration testing and ethical hacking and report findings.
NT 3.4	Explore monitoring tools to detect unusual activity and respond to threats.
NT 4: Demonstrate knowledge of common troubleshooting resources and techniques relevant to networking systems.	
NT 4.1	Identify common help desk roles and tools such as remote access software, FAQs, and CRM systems.
NT 4.2	Use proper documentation and incident reporting.
NT 4.3	Incorporate customer service strategies to respond to issues.
NT 5: Explore careers in network technology.	
NT 5.1	Identify skills, interests, and abilities related to network technology.
NT 5.2	Compare personal interest inventory (SDMyLife) results with the skills, interests, and abilities needed for a career in network technology.
NT 5.3	Research labor market information for careers in network technology, including the impact of generative AI on network technology careers.
NT 5.4	Demonstrate necessary job skills for careers in network technology.

NT 5.5	Establish connections with industry professionals in the field of networking.
NT 5.6	Investigate career opportunities, dual credit opportunities, post-secondary training, and certification requirements related to networking careers.

Computer Hardware - 10251	
CH 1: Apply knowledge of hardware design, operation and maintenance.	
CH 1.1	Understand how to design and assemble systems that use computer programs to interact with hardware.
CH 1.2	Install and configure essential computer hardware and software components.
CH 2: Understand the relationships among computer hardware, networks, and operating systems.	
CH 2.1	Identify new IT technologies relevant to computer hardware.
CH 2.2	Determine compatibility of hardware and software.
CH 2.3	Differentiate between an operating system, utility programs, and application software.
CH 3: Understand basic networking services.	
CH 3.1	Summarize the basics of Internet Protocol (IP) addressing.
CH 3.2	Troubleshoot basic hardware problems.
CH 4: Explore careers related to computer hardware and digital technology.	
CH 4.1	Identify skills, interests, and abilities related to computer hardware and digital technology.
CH 4.2	Compare skills, interests, and abilities with common attributes of digital technology occupations.
CH 4.3	Research labor market information for careers related to computer hardware repair and digital technology.
CH 4.4	Demonstrate the necessary job skills needed for digital technology industries.

Software Solutions - 10153	
SS 1: Apply the software development process: planning, designing, coding, and testing.	
SS 1.1	Define functional end user requirements and potential solutions.
SS 1.2	Create flowcharts, pseudocode, or other design tools to outline the structure of a program before coding.
SS 1.3	Apply proper syntax within a program.
SS 1.4	Demonstrate the ability to compile and apply problem-solving to debugging and executing programs.
SS 1.5	Construct solutions to problems based on user feedback.
SS 2: Apply language-fundamental commands and operations to create computer programs.	
SS 2.1	Demonstrate the ability to use basic elements of a specific language.
SS 2.2	Employ basic arithmetic expressions in programs.
SS 2.3	Demonstrate the ability to use data types in programs.
SS 2.4	Apply functions/methods.
SS 2.5	Compare and contrast AI-generated and human-created code.
SS 2.6	Demonstrate appropriate and ethical use of AI-generated code.
SS 3: Apply control structures.	
SS 3.1	Demonstrate the ability to use relational and logical operators in programs.
SS 3.2	Construct and apply conditional statements.
SS 3.3	Develop and incorporate loops in programs.
SS 4: Integrate arrays.	
SS 4.1	Demonstrate the ability to use arrays in programs.
SS 4.2	Demonstrate the ability to use strings in programs.
SS 5: Explore career opportunities in programming and software engineering industries.	
SS 5.1	Evaluate personal interests, skills, and learning preferences to identify alignment with careers in computer programming, recognize potential skill gaps, and develop an action plan to strengthen readiness for those careers.
SS 5.2	Investigate career opportunities, trends, and requirements related to computer programming/software engineering careers.
SS 5.3	Demonstrate job skills for computer programming/software engineering careers.
SS 5.4	Examine the impact of the generative AI field of computer science.

Web Development - 10201	
WD 1: Identify basic principles of how the Internet is constructed, how it functions, and how it is used.	
WD 1.1	Identify the infrastructure required to access the Internet.
WD 1.2	Summarize Internet development and functions.
WD 1.3	Recognize the parts of a Uniform Resource Locator (URL) and the purpose of domains.
WD 1.4	Define the function of a Domain Name Server (DNS).
WD 1.5	Define important Internet communications protocols and their roles in delivering basic Internet services.
WD 1.6	Demonstrate knowledge of standard copyright rules.
WD 1.7	Explain the use and purpose of an acceptable use policy (AUP).
WD 1.8	Define the basics of website security.
WD 2: Create web pages.	
WD 2.1	Identify the components of and the process to create a web page.
WD 2.2	Demonstrate appropriate file structure and naming conventions.
WD 2.3	Create web pages with appropriate HTML structure and standards that can be validated using the World Wide Web Consortium validator (W3C).
WD 2.4	Demonstrate the use of elements and attributes.
WD 2.5	Incorporate meta tags for page documentation and search engine optimization (SEO).
WD 2.6	Examine and demonstrate ADA accessibility components of website design.
WD 2.7	Examine laws and policies that regulate website design such as copyright, fair use.
WD 3: Format and style web pages using Cascading Style Sheets (CSS) to control layout, colors, fonts, and other visual elements.	
WD 3.1	Apply CSS to a website to control the layout, design, and visual appearance of web content.
WD 3.2	Apply basic CSS selectors to modify the appearance of HTML content.
WD 4: Plan, design, implement, and maintain website(s).	
WD 4.1	Demonstrate the use of scripting and other interactive tools.
WD 4.2	Plan site design and page layout based on the target audience.
WD 4.3	Create original content for websites.
WD 4.4	Edit and revise a site based on user feedback.
WD 4.5	Evaluate the ethical and practical implications of using AI in web development.

WD 5: Explore advanced web concepts.	
WD 5.1	Explore the use of scripting and other interactive tools.
WD 5.2	Explore other web technologies.
WD 6: Explore careers in web development.	
WD 6.1	Identify skills, interests, and abilities related to web development.
WD 6.2	Compare personal interest inventory (SDMyLife) results with the skills, interests, and abilities needed for a career in web development.
WD 6.3	Research labor market information for careers in web development, including opportunities in freelance work and industry-specific roles.
Advanced Web Development - 10202	
AWD 1: Demonstrate creation of a website for a real-world application.	
AWD 1.1	Create a website.
AWD 1.2	Demonstrate appropriate file structure and naming conventions.
AWD 1.3	Create websites with appropriate HTML structure and standards that can be validated using World Wide Web Consortium validator (W3C).
AWD 1.4	Demonstrate the use of elements and attributes.
AWD 1.5	Incorporate meta tags for page documentation and search engine optimization (SEO).
AWD 1.6	Apply advanced elements to create a website.
AWD 1.7	Examine and demonstrate ADA accessibility components.
AWD 1.8	Examine laws and policies that regulate website design such as copyright and fair use.
AWD 2: Format and style web pages using Cascading Style Sheets (CSS) to control layout, colors, fonts, and other visual elements.	
AWD 2.1	Identify essential aspects of using CSS.
AWD 2.2	Apply CSS to a website to control the layout, design, and visual appearance of web content.
AWD 2.3	Use selectors in a CSS.
AWD 2.4	Format page layout with advanced CSS.
AWD 3: Plan, design, implement, and maintain website(s).	
AWD 3.1	Summarize project requirements.
AWD 3.2	Develop site design and page layout utilizing best practices.
AWD 3.3	Create original content for a website.

AWD 3.4	Upload and maintain a site.
AWD 3.5	Edit and revise a site based on user feedback.
AWD 3.6	Evaluate the ethical and practical implications of using AI in web development.
AWD 4: Explore advanced web concepts.	
AWD 4.1	Demonstrate the use of scripting and other interactive tools.
AWD 4.2	Explore other web technologies.
AWD 5: Explore advanced careers in web development.	
AWD 5.1	Identify skills, interests, and abilities related to web development.
AWD 5.2	Compare personal interest inventory (SDMyLife) results with the skills, interests, and abilities needed for a career in web development.
AWD 5.3	Research labor market information for careers in web development, including opportunities in freelance work and industry-specific roles.

Cross Cluster Standards also connected with the Digital Technology Cluster	
Primary Cluster	**Course**
Manufacturing	Robotics - 21009
Manufacturing	Electronics – 17106
AP (Advanced Placement) course standards are set by College Board	

SEQUENCE OF COURSES

EDUCATION

CARING FOR COMMUNITIES

south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

EARLY CHILDHOOD DEVELOPMENT PATHWAY

- 19001 Introduction to Human Services
- 19051 Human Dev: Preschool to School Age
- 19052 Human Development: Prenatal to Toddlers
- 19151 Introduction to Education and Training
- 19152 SD Educators for Tomorrow
- 19153 Gateway to the Child Development Associate (CDA)

MIDDLE SCHOOL COURSES

- 19000 Grades 5-8 Family and Consumer Science
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Education

The Education Career Cluster includes careers that help people learn and grow at every stage of life, from early childhood through adulthood. It covers teaching, instructional design, counseling, and community outreach. At its core, the Education Cluster is focused on developing the next generation of teachers who will guide learners and shape the future of education. Courses create a strong foundation for lifelong learning and support the growth of both individuals and communities. The Education Cluster is an integral part of a comprehensive Family and Consumer Sciences Cluster.

Introduction to Education - 19151	
ED 1: Explore career opportunities in education professions and related careers.	
ED 1.1	Investigate careers in human development.
ED 1.2	Investigate careers in teaching, training, and facilitating.
ED 1.3	Investigate careers in learner support and community education.
ED 1.4	Compare and contrast the paths that lead to careers in the education cluster.
ED 1.5	Summarize the various roles and responsibilities of professionals in education.
ED 2: Demonstrate professional skills required by education professions and related careers.	
ED 2.1	Evaluate concepts of effective and professional communication skills needed in an educational setting.
ED 2.2	Compare and contrast ways to effectively communicate with a variety of stakeholders across the education field (e.g., oral, interpersonal, written, and electronic communication).
ED 2.3	Explore management of time, space, learners, and resources for an effective and efficient learning environment.
ED 2.4	Describe effective leadership skills.
ED 2.5	Identify professionalism expected in educational settings.
ED 2.6	Evaluate planning and presentation skills in education professions or career settings.
ED 3: Analyze ethics and legal responsibilities in education professions and related careers.	
ED 3.1	Explore goals, policies, laws, and procedures to ensure a positive and safe learning environment.
ED 3.2	Examine professional ethics as they relate to education and related careers.
ED 3.3	Explain the ethical and legal importance of maintaining confidentiality per the Family Educational Rights and Privacy Act (FERPA).
ED 4: Research approaches to learning in education professions and related careers.	
ED 4.1	Explore how and where children and adults learn.

ED 4.2	Explain how standards guide teaching and learning.
ED 4.3	Investigate theories of child and adult learning in education systems and practices.
ED 4.4	Research community-based education practices and programs.
ED 5: Investigate influences on education professions and related careers.	
ED 5.1	Describe local, state, and federal factors impacting education and community programs.
ED 5.2	Investigate the governance structures, laws, and funding of education systems.
ED 5.3	Evaluate the role of current and emerging technology in educational and community settings.

Human Development: Preschool to School-Age - 19051	
HDPS 1: Analyze principles of growth and development of preschool through school-aged children.	
HDPS 1.1	Apply concepts from human development theories to preschool through school-aged children.
HDPS 1.2	Analyze the physical, social, emotional, and intellectual development of preschool through school-aged children.
HDPS 2: Analyze internal and external conditions that influence growth and development.	
HDPS 2.1	Examine the effects of culture, environment, life events, family challenges, and inherited influences on growth and human development.
HDPS 2.2	Analyze how geographic location, public policy, and global trends impact human growth and development across the lifespan.
HDPS 3: Analyze strategies that promote growth and development of preschool through school-aged children.	
HDPS 3.1	Examine strategies that support physical development (e.g., motor skills, sleep, and nutrition).
HDPS 3.2	Examine social and emotional aspects of development (e.g., self-awareness, self-esteem, resiliency, identity, emotions, attachments, and autonomy).
HDPS 3.3	Design strategies that support intellectual development (e.g., brain growth, literacy, creativity, and language).
HDPS 3.4	Describe the features of play and their role in learning and development.
HDPS 3.5	Evaluate experiences that address the needs of young children to promote growth and development within the developmental domains.
HDPS 4: Create and maintain a safe and healthy learning environment for preschool through school-aged children.	
HDPS 4.1	Examine ways to ensure a healthy environment through careful observation and proactive measures.
HDPS 4.2	Discuss ways to incorporate wellness during daily routines in the childcare setting, helping children develop good health habits.
HDPS 4.3	Outline measures for providing nutritious meals and snacks, based on current nutrition guidelines for young children.
HDPS 4.4	Examine common infectious diseases, ways of responding to them, and methods of preventing the spread in a childcare setting.
HDPS 4.5	Define child abuse and neglect and identify the signs of each type.
HDPS 4.6	Investigate support systems for caregivers, teachers, and children and the issues they address.
HDPS 5: Investigate career paths for working with preschool and school-aged children.	
HDPS 5.1	Summarize knowledge and skills for a career working with preschool through school-aged children.
HDPS 5.2	Observe preschool and school-aged children in a variety of settings.

Human Development: Prenatal to Toddler - 19052	
HDPT 1: Analyze principles of human development.	
HDPT 1.1	Investigate human development theories for prenatal development through toddlerhood.
HDPT 1.2	Analyze family, societal, hereditary, and environmental factors that influence infant and toddler development.
HDPT 1.3	Examine how family and caregiver relationships support positive prenatal to toddler development.
HDPT 1.4	Investigate support systems for pre-pregnancy care, prenatal care, infants, and toddlers.
HDPT 2: Analyze development from conception through birth.	
HDPT 2.1	Analyze factors that promote or hinder healthy prenatal development.
HDPT 2.2	Explore childbirth options and postpartum care.
HDPT 2.3	Examine prenatal brain development and the structures and functions of the brain.
HDPT 3: Analyze the development of infants.	
HDPT 3.1	Analyze the physical, emotional, social, and intellectual development of infants.
HDPT 3.2	Examine the importance of play and human interaction in infants' learning, development, and executive function.
HDPT 3.3	Analyze the sensitive periods of the brain and the importance of experiences and environments during infancy.
HDPT 4: Analyze the development of toddlers.	
HDPT 4.1	Analyze the physical, emotional, social, and intellectual development of toddlers.
HDPT 4.2	Examine the importance of play and human interaction in toddlers' learning, development, and executive function.
HDPT 4.3	Analyze the sensitive periods of the brain and the importance of experiences and environments during the toddler stage.
HDPT 5: Investigate career paths that involve working with prenatal care through toddlerhood.	
HDPT 5.1	Summarize knowledge and skills for a career working with prenatal development through toddlerhood.
HDPT 5.2	Observe infants and toddlers in a variety of settings.

South Dakota Educators for Tomorrow - 19152	
SDE 1: Evaluate personal and professional attributes essential to becoming an effective teacher.	
SDE 1.1	Assess personal attributes as they relate to teaching.
SDE 1.2	Analyze professional attributes that apply to teachers.
SDE 1.3	Explore the professional development and community service of teachers.
SDE 1.4	Analyze expected effects of compliance and non-compliance with the Code of Ethics and Standard Practices for South Dakota Educators.
SDE 2: Analyze the foundations of education.	
SDE 2.1	Examine the history of education.
SDE 2.2	Analyze the influence of laws and educational reforms from the past, present, and future.
SDE 2.3	Compare and contrast types of educational settings.
SDE 3: Review the developmental needs of preschool and school-aged children.	
SDE 3.1	Apply concepts from human development theories to children.
SDE 3.2	Explore the physical, social, emotional, and intellectual development of children.
SDE 4: Analyze knowledge required for careers in education.	
SDE 4.1	Explore subject matter knowledge needed for careers in education.
SDE 4.2	Analyze relationships within families and communities that impact teaching and training.
SDE 4.3	Explore the certification process for teachers.
SDE 4.4	Research the compensation, benefits, and career advancement opportunities in education.
SDE 4.5	Plan for a positive learning environment.
SDE 4.6	Interpret emergency and safety procedures in education settings.
SDE 5: Explore the importance of student needs and standards to the instructional planning process.	
SDE 5.1	Analyze physical, social, emotional, and intellectual needs of students.
SDE 5.2	Explain the relationship between effective instructional practices and providing support for learning differences, exceptional learners, and learners with special needs.
SDE 5.3	Research accommodations and modifications of lesson planning for students' personalized needs.
SDE 6: Demonstrate integration of curriculum and instruction to meet the developmental needs of students.	
SDE 6.1	Investigate a variety of curriculum and instructional models/strategies.
SDE 6.2	Assess group processes and skills for working collaboratively in education.

SDE 6.3	Evaluate lesson plans using essential instructional components.
SDE 6.4	Assess student learning for a standard-based or performance-based assessments
SDE 7: Apply instructional practices and concepts in a classroom field experience.	
SDE 7.1	Apply professional skills and behaviors in a classroom field experience.
SDE 7.2	Evaluate teaching styles, learning environments, and classroom management utilizing observation checklists or other evaluation tools.
SDE 7.3	Implement instructional practice in a classroom field experience.
SDE 7.4	Plan and deliver a lesson.

Gateway to the Child Development Associate (CDA) - 19153	
CDA 1: Establish safe and healthy learning environments.	
CDA 1.1	Identify and apply developmentally appropriate methods for promoting safety awareness in outdoor and indoor learning environments for young children.
CDA 1.2	Demonstrate knowledge of first aid, infant and child cardiopulmonary resuscitation (CPR).
CDA 1.3	Evaluate the effectiveness of nutrition policies and meal planning practices using Child and Adult Care Food Program (CACFP) guidelines in early childhood settings.
CDA 1.4	Develop a plan for proper sanitation procedures (toys, surfaces, and equipment), disease prevention practices, and communicating health and safety information to families.
CDA 1.5	Explain the role and responsibilities of a mandated reporter.
CDA 2: Design and implement developmentally appropriate activities that foster physical (gross and fine motor) and intellectual development across all domains.	
CDA 2.1	Implement child development theories and observations to assess, reflect, and respond to individual needs and concerns.
CDA 2.2	Facilitate purposeful play and integrate content-area learning (e.g., literacy, math, science, arts) to enhance development in meaningful, engaging ways.
CDA 2.3	Design effective learning environments that promote hands-on and social play, ensuring safety and accessibility for children.
CDA 2.4	Identify developmentally appropriate toys that reflect different interests and abilities.
CDA 2.5	Develop a daily schedule that integrates structure, free play, routines, and transitions.
CDA 3: Foster children's social and emotional growth.	
CDA 3.1	Identify self-esteem and discover strategies to nurture a positive self-image.
CDA 3.2	Demonstrate strategies to promote positive behavior in early childhood settings to assist children in processing their emotions based on their temperament.
CDA 4: Examine ways to involve families and the variety of roles that parents/guardians may play in the childcare program.	
CDA 4.1	Examine the benefits of good communication for the program, families, and children.
CDA 4.2	Utilize effective communication tools with families.
CDA 4.3	Identify barriers to family involvement and ways to overcome them.
CDA 4.4	Identify the components of family engagement and the mutual expectations of parents, guardians, and caregivers.
CDA 5: Implement career skills working with preschool and school-aged children.	
CDA 5.1	Compare and contrast regulations, policies, and record-keeping necessary for an effective program.
CDA 5.2	Explain Developmentally Appropriate Practices (DAP).

CDA 5.3	Examine types of childcare programs, their capacities, and staff qualifications.

SEQUENCE OF COURSES

ENERGY AND NATURAL RESOURCES

CULTIVATING RESOURCES



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APPROVED CLUSTER COURSES

NATURAL RESOURCES AND ENVIRONMENTAL SERVICES PATHWAY
18504 Introduction to Natural Resources
18501 Wildlife & Fisheries
18502 Natural Resource Management
18508 Issues in Environmental Science
18001 Intro to Ag, Food, and Natural Resources
18203 Ag Leadership and Communication
18248 Independent Supervised Agricultural Experience
15151 Introduction to Fire Science

ENERGY PATHWAY
20101 Introduction to Energy/Power
18308 Ag. Biotechnology
21060 Energy Transmission and Distribution
18502 Advanced Natural Resources
18504 Introduction to Natural Resources
17106 Electronics
18001 Intro to Ag, Food, and Natural Resources
18203 Ag Leadership and Communication
18248 Independent Supervised Agricultural Experience

MIDDLE SCHOOL COURSES

- 18000 Grades 5-8 Agriculture, Food, and Natural Resources
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

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INDUSTRY RECOGNIZED CREDENTIALS

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DUAL CREDIT COURSES

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POST-SECONDARY OPTIONS

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Career Cluster

Energy and Natural Resources

The Energy & Natural Resources Career Cluster spans careers in traditional and renewable fuel production, power generation and energy conversion, utilities, environmental preservation, ecological research, and resource extraction. These industries focus on efficient and responsible resource management, including conservation and energy transmission/distribution to minimize environmental impacts and meet global energy needs. Careers in this Cluster are dedicated to creating a sustainable future, innovating cleaner energy solutions, and preserving our planet's natural resources for generations to come.

Introduction to Natural Resources -18504	
INR 1: Explore historical perspectives of the use and management of natural resources.	
INR 1.1	Describe key milestones in the history of the management of natural resources in the United States.
INR 1.2	Explore historical figures of significance in the management of natural resources.
INR 1.3	Explain the impact of historical legislation and regulations on the management of natural resources.
INR 1.4	Compare and contrast the relationship with natural resources between Native American and European cultures.
INR 2: Examine the importance of natural resources and human interrelations.	
INR 2.1	Explain resource management components to establish or enhance relationships in natural resource systems.
INR 2.2	Explain how GPS, GIS, and emerging technologies impact natural resource management.
INR 2.3	Examine planning data to determine natural resource status.
INR 2.4	Discuss safety related to weather and other environmental hazards an outdoor environment.
INR 2.5	Define and investigate the role of ecosystems and their impact on human society.
INR 3: Describe techniques and equipment needed to manage and conserve natural resources.	
INR 3.1	Explain the importance of and conduct forestry management techniques.
INR 3.2	Explain the importance of and conduct water management techniques.
INR 3.3	Explain the importance of and conduct soil management techniques.
INR 3.4	Explain the importance of and conduct rangeland management techniques.
INR 3.5	Explain the importance of and conduct air-quality management techniques.
INR 3.6	Explain the importance of and conduct wildlife management techniques.

INR 4: Interpret scientific principles of natural resource management activities.	
INR 4.1	Identify and classify plant-based and animal-based natural resources.
INR 4.2	Identify natural cycles and related phenomena to describe ecological concepts and principles.
INR 4.3	Examine soil compositions, properties, and health.
INR 4.4	Demonstrate techniques used to classify soils.
INR 4.5	Analyze wetland, watershed and groundwater properties, classifications and functions.
INR 5: Understand local and global trends and implications of resource extraction.	
INR 5.1	Define resource extraction.
INR 5.2	Describe how various resources are extracted.
INR 5.3	List known resources of fuel and minerals around the world.
INR 5.4	Evaluate the cost and benefits of natural resource extraction.
INR 6: Describe production practices and processing procedures for natural resources.	
INR 6.1	Describe how natural resource products are produced, harvested, processed and used.
INR 7: Utilize career-planning concepts, tools, and strategies to explore careers in natural resources.	
INR 7.1	Investigate a variety of careers in natural resources, including required skills, education, and typical career paths.

Natural Resource Management - 18502	
NRM 1: Evaluate human impact on the environment.	
NRM 1.1	Evaluate factors affecting the human population.
NRM 1.2	Evaluate the consequences of human population growth on the environment.
NRM 1.3	Examine the causes, environmental effects and methods for controlling pollution.
NRM 2: Apply ecological concepts and principles of soil and soil management.	
NRM 2.1	Investigate soil composition and health.
NRM 2.2	Evaluate the role of soil management strategies and their impact on conservation.
NRM 2.3	Analyze soils for agricultural and homesite uses.
NRM 2.4	Analyze existing soil surveys to develop effective management plans.
NRM 3: Apply ecological concepts and principles of rangeland management.	
NRM 3.1	Summarize the interrelationships of rangeland management, the environment, wildlife management, and the livestock industry.
NRM 3.2	Discuss sustainable practices used to improve rangeland health.
NRM 3.3	Identify plants important to quality rangeland and determine rangeland conditions.
NRM 3.4	Analyze the carrying capacity in various rangelands for both wildlife species and domestic livestock.
NRM 4: Apply ecological concepts and principles of forest management practices.	
NRM 4.1	Identify trees and classify forestry species.
NRM 4.2	Discuss sustainable practices to improve forest health.
NRM 4.3	Demonstrate forestry management techniques.
NRM 5: Apply ecological concepts and principles of fisheries and wildlife in natural resources.	
NRM 5.1	Identify fish and wildlife species.
NRM 5.2	Compare and contrast fish and wildlife management.
NRM 5.3	Explore invasive species and diseases impacting fish and wildlife health.
NRM 5.4	Differentiate between a variety of management practices used to sustainably manage wildlife populations.
NRM 5.5	Create a plan to enhance fish and wildlife habitats in South Dakota.
NRM 6: Apply ecological concepts and principles of air and water resource management.	
NRM 6.1	Compare and contrast regulation of air and water quality.

NRM 6.2	Define appropriate and sustainable water conservation measures.
NRM 6.3	Analyze the way in which water and air management affect the environment and human needs.
NRM 7: Utilize career-planning concepts, tools, and strategies to explore careers in natural resources.	
NRM 7.1	Investigate a variety of specializations in the natural resources sector (e.g., required skills, education, and typical career paths).

Wildlife and Fisheries - 18501	
WF 1: Explore historical perspectives of the use and management of wildlife and fisheries.	
WF 1.1	Describe key milestones in the history of the management of wildlife and fisheries in the United States.
WF 1.2	Explore historical figures of significance in the management of wildlife and fisheries.
WF 1.3	Explain the impact of historical legislation and regulations on the management of wildlife and fisheries.
WF 2: Demonstrate the importance of fish and wildlife management, including their respective habitats.	
WF 2.1	Explore the *North American Model of Wildlife Conservation,* a framework of laws and policies that ensures wildlife is held in the public trust and managed by science.
WF 2.2	Demonstrate an understanding of the sustainable management of wildlife and fisheries.
WF 2.3	Identify fish and wildlife species.
WF 3: Identify economic and social issues related to fish and wildlife.	
WF 3.1	Demonstrate safety practices related to hunting and fishing activities.
WF 3.2	Discuss hunting/harvesting fish and wildlife species as a management technique.
WF 3.3	Investigate processing techniques to use game and fish as food sources.
WF 3.4	Investigate the impact of invasive species on wildlife and fisheries.
WF 3.5	Examine the local and national economic impact of wildlife and fisheries.
WF 3.6	Explain the social impact of wildlife populations and management strategies.
WF 4: Compare the life patterns of fish and wildlife.	
WF 4.1	Identify the life cycles of fish and wildlife species.
WF 4.2	Diagnose wildlife and fish diseases.
WF 4.3	Create a plan to mitigate wildlife and fish diseases.
WF 4.4	Identify endangered species and conservation strategies.
WF 5: Utilize career-planning concepts, tools, and strategies to explore careers in wildlife and fisheries conservation.	
WF 5.1	Investigate a variety of specializations in the wildlife and fisheries sector (e.g., required skills, education, and typical career paths).

Introduction to Energy and Power - 20101	
IEP 1: Explore energy and power sources.	
IEP 1.1	Examine the historical development of energy and power production.
IEP 1.2	Assess the impact of energy and power on the way people live and work.
IEP 1.3	Define various forms of energy (e.g., wind, solar, electrical, nuclear, biofuels, hydro, coal, geothermal, natural gas, and oil).
IEP 1.4	Analyze the role of society in the use of energy generation.
IEP 1.5	Analyze the cultural, socioeconomic and political effects of alternative energy technologies.
IEP 2: Examine the relationships among work, energy, and power.	
IEP 2.1	Define work, energy, and power.
IEP 2.2	Examine the relationship between power and energy sources.
IEP 2.3	Compare different units for energy and power.
IEP 2.4	Calculate watts, volts, amps, and resistance.
IEP 3: Explore the transmission of energy and power.	
IEP 3.1	Investigate how a mechanical system operates.
IEP 3.2	Explain the types of simple machines.
IEP 3.3	Explore both liquid and gas forms of power transmission.
IEP 3.4	Discover the laws and regulations that govern electricity systems.
IEP: 4 Explore renewable energy.	
IEP 4.1	Research the sources of renewable energy.
IEP 4.2	Define key terms and scientific laws related to renewable energy.
IEP 4.3	Explain the various types of hydroelectric energy.
IEP 4.4	Explain the various types of wind energy.
IEP 4.5	Explain the various types of solar energy.
IEP 4.6	Explain the various types of biofuels used for energy.
IEP 4.7	Explain the various types of geothermal energy.
IEP 5: Explore fossil fuel energy.	
IEP 5.1	Understand the sources of fossil fuel energy.
IEP 5.2	Define key terms of fossil fuel energy.

IEP 5.3	Explain the various types of oil energy.
IEP 5.4	Explain the various types of coal energy.
IEP 5.5	Explain the various types of natural gas energy.
IEP 6: Explore emerging energy sources (e.g., nuclear, battery storage).	
IEP 6.1	Understand the sources of emerging energy.
IEP 6.2	Define key terms of emerging energy.
IEP 6.3	Explain the various types of emerging energy.
IEP 7: Implement safety with power technology.	
IEP 7.1	Explain the role of the Occupational Safety and Health Administration (OSHA).
IEP 7.2	Examine safety issues relating to mechanical systems.
IEP 7.3	Employ safety practices with fluid power.
IEP 7.4	Identify fire classification and extinguishers.
IEP 7.5	Employ safety practices with electricity.
IEP 8: Understand scientific concepts for energy and power technology.	
IEP 8.1	Define and identify the categories of electricity (e.g., alternating current (AC) and direct current (DC), static).
IEP 8.2	Explain how energy converts from one form to another.
IEP 8.3	Explore the byproducts of energy production.
IEP 9: Utilize career-planning concepts, tools, and strategies to explore careers in energy and natural resources.	
IEP 9.1	Investigate a variety of careers in energy and natural resources, including required skills, education, and typical career paths.

Energy Transmission and Distribution - 21060	
ETD 1: Examine the history of the energy sector.	
ETD 1.1	Describe key milestones in the history of the energy sector in the United States.
ETD 1.2	Explore historical figures of significance in the energy sector.
ETD 2: Examine energy transmission, distribution, and storage systems.	
ETD 2.1	Define the equipment used in the electric power transmission process.
ETD 2.2	Identify types of energy storage.
ETD 2.3	Define challenges related to energy storage.
ETD 2.4	Identify the electric power distribution process.
ETD 3: Assess the importance of resiliency and efficiency in the distribution of energy.	
ETD 3.1	Explain the flow of energy from generation through distribution to the consumer.
ETD 3.2	Examine the efficiency of energy transmission.
ETD 3.3	Identify various power losses across transmission and distribution systems.
ETD 4: Investigate government regulations related to energy utilities.	
ETD 4.1	Identify which state agencies regulate each utility type in South Dakota.
ETD 4.2	Examine federal government regulations on utilities.
ETD 5: Examine the tools, equipment, and safety practices used in the energy sector.	
ETD 5.1	Define safety and maintenance standards used in various utility industries.
ETD 5.2	Identify the tools needed to install utility system components.
ETD 5.3	Explain how components of power systems are planned.
ETD 6: Utilize career-planning concepts, tools, and strategies to explore careers in energy transmission and distribution.	
ETD 6.1	Investigate a variety of careers in energy and natural resources, including required skills, education, and typical career paths.
ETD 6.2	Identify different credentials and specializations in the energy sector.

Issues of Environmental Science - 18508	
IES 1: Examine ecological principles and functions.	
IES 1.1	Examine the structure and function of ecosystems.
IES 1.2	Analyze the major biomes of the Earth and the biodiversity associated with these biomes.
IES 1.3	Analyze population dynamics.
IES 2: Evaluate human population dynamics on the environment.	
IES 2.1	Evaluate factors affecting human populations.
IES 2.2	Evaluate the consequences of human population growth.
IES 2.3	Explore the approaches that address overpopulation and the effect on the environment.
IES 3: Appraise our natural resources and their conservation and management.	
IES 3.1	Explain the types, uses and history of renewable and nonrenewable resources.
IES 3.2	Assess methods of conservation of natural resources.
IES 3.3	Examine the impact of waste production and management on the environment.
IES 4: Examine energy sources and their conservation.	
IES 4.1	Compare and contrast conventional and alternative energy sources.
IES 4.2	Examine the types of energy-related pollution.
IES 4.3	Examine the impact of energy production on the environment.
IES 5: Examine the consequences of human interaction with the environment.	
IES 5.1	Examine the causes, environmental effects and methods for controlling pollution.
IES 5.2	Examine the environmental impact on human health.
IES 5.3	Appraise the sustainability of human practices as they relate to the environment.
IES 6: Appraise personal and civic responsibility with regard to the environment.	
IES 6.1	Evaluate personal views concerning the environment.
IES 6.2	Evaluate the rights and responsibilities of citizens in maintaining a healthy environment.
IES 7: Utilize career-planning concepts, tools, and strategies to explore careers in environmental science.	
IES 7.1	Investigate a variety of careers in energy and natural resources, including required skills, education, and typical career paths.

Cross Cluster Standards also connected with the Energy and Natural Resources Cluster	
Primary Cluster	**Course**
Agriculture	Ag Biotechnology- 18308
Agriculture	Introduction to Ag, Food, and Natural Resources – 18001
Agriculture	Independent Supervised Agriculture Experience – 18248
Manufacturing	Electronics - 17106

SEQUENCE OF COURSES

FINANCIAL SERVICES

INVESTING IN THE FUTURE

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APPROVED CLUSTER COURSES

ACCOUNTING AND FINANCE PATHWAY

- 12102 Principles of Banking
- 12104 Accounting I
- 12108 Accounting II
- 12106 Principles of Insurance
- 12107 Investment Planning
- 10005 Business Computer Applications
- 12051 Introduction to Business
- 12052 Business Management
- 12054 Business Law
- 12061 Entrepreneurial Skills
- 12105 Business Economics
- 12061 AP Business with Personal Finance

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Financial Services

The Financial Services Career Cluster encompasses careers in managing and advising financial transactions, including banking, lending, corporate finance, debt management, accounting, insurance, and real estate. These careers contribute to economic stability and growth by supporting the financial health of individuals and organizations.

Accounting I - 12104	
A-I 1: Examine the role of accounting in business.	
A-I 1.1	Define accounting and its primary function in a business setting.
A-I 1.2	Differentiate between types of accounting and their purposes in business.
A-I 1.3	Compare and contrast various types of business ownership and accounting principles (e.g., GAAP, FASB, and IFRS).
A-I 1.4	Apply internal controls to proper cash management techniques.
A-I 2: Demonstrate the basic principles and procedures of the accounting cycle.	
A-I 2.1	Examine, analyze, and categorize financial transactions.
A-I 2.2	Demonstrate an understanding of the basic accounting equation (Assets = Liabilities + Owner's Equity).
A-I 2.3	Use the accounting equation as a guide to journalize transactions including preparing necessary documents and transactions.
A-I 2.4	Post information from journals to general and subsidiary ledgers.
A-I 2.5	Analyze and complete payroll using appropriate accounting practices.
A-I 3: Create and interpret financial statements.	
A-I 3.1	Complete an accounting worksheet with journal and post adjusting entries,
A-I 3.2	Prepare and interpret formal end-of-fiscal-period financial statements (e.g., income statement, statement of owner's equity, and balance sheet).
A-I 3.3	Journalize post-closing entries and prepare the post-closing trial balance.
A-I 4: Explore career opportunities relating to accounting and financial services.	
A-I 4.1	Identify career opportunities related to accounting and financial services.
A-I 4.2	Explore the education or credentials required for careers in the accounting field.
A-I 4.3	Identify ethical considerations and regulations in accounting practices.
A-I 4.4	Demonstrate proficiency using industry-standard technology for accounting practices.

Accounting II - 12108	
A-II 1: Demonstrate advanced principles and procedures of the accounting cycle.	
A-II 1.1	Analyze and prepare financial transactions for a departmentalized accounting system.
A-II 1.2	Apply accounting control system procedures to maintain accurate records.
A-II 2: Demonstrate advanced accounting procedures.	
A-II 2.1	Demonstrate the ability to account for uncollectible accounts/bad debts.
A-II 2.2	Examine and apply the principles for plant assets and their depreciation.
A-II 2.3	Analyze and apply the principles for notes payable and notes receivable.
A-II 2.4	Calculate the cost of merchandise using various inventory methods.
A-II 2.5	Analyze the principles for accruals and deferrals.
A-II 3: Perform accounting functions specific to corporations.	
A-II 3.1	Analyze the factors that affect acquiring additional capital, issuing stock, and calculating and paying dividends.
A-II 3.2	Analyze and interpret financial statements for corporations.
A-II 4: Perform accounting functions specific to partnerships.	
A-II 4.1	Analyze the factors in forming a partnership, allocating profits and losses, and managing changes in partnership ownership.
A-II 4.2	Analyze and interpret financial statements for partnerships to support effective business decision-making.
A-II 5: Examine the financial conditions of corporations to make informed business decisions.	
A-II 5.1	Evaluate and assess budget reports to make business decisions.
A-II 5.2	Demonstrate specialized accounting procedures to track cash flow.
A-II 5.3	Evaluate vertical and horizontal statements and ratios to formulate business decisions.
A-II 5.4	Apply concepts of business ownership and accounting principles (e.g., GAAP, FASB, and IFRS).
A-II 6: Explore career opportunities relating to accounting and financial services.	
A-II 6.1	Identify career opportunities related to accounting and financial services.
A-II 6.2	Summarize the skills and abilities needed for careers in the accounting field and the education or credentials required.
A-II 6.3	Apply ethical considerations and regulations in accounting practices.
A-II 6.4	Demonstrate proficiency using industry-standard technology for accounting practices.

Principles of Banking - 12102	
PB 1: Describe the evolution of banking and its role within the financial services industry.	
PB 1.1	Explore the history of the banking industry and how it has evolved over time.
PB 1.2	Compare and contrast the different types of financial intermediaries.
PB 2: Describe laws and regulations that manage business operations and transactions in the banking industry.	
PB 2.1	Summarize compliance programs and their role in risk management.
PB 2.2	Describe regulations and ethical practices governing banking services.
PB 2.3	Examine the role of Federal Deposit Insurance Corporation (FDIC) and National Credit Union Administration (NCUA) in the financial industry.
PB 3: Understand how to create and maintain positive, ongoing relationships with banking customers.	
PB 3.1	Understand how to develop positive relationships with customers to enhance company image.
PB 3.2	Explain the importance of managing customer relationships and financial portfolios over time.
PB 3.3	Describe sales techniques for acquiring new business.
PB 3.4	Explore the benefits of cross-selling financial services to potential customers.
PB 3.5	Analyze how ethical sales practices impact the banking industry.
PB 4: Manage the use of financial resources to enhance banking performance.	
PB 4.1	Describe the way banks generate revenue.
PB 4.2	Explore the various costs to banks and the factors that influence them.
PB 4.3	Utilize financial formulas commonly used in banking to determine the growth and stability of banking services.
PB 4.4	Investigate financial statements for a financial institution.
PB 5: Explore the application of technology in the financial industry.	
PB 5.1	Utilize industry-standard technology to increase workplace efficiency and effectiveness.
PB 5.2	Explore how consumer financial products and processes are evolving through the use of technology (e.g., mobile banking platforms and digital wallet).
PB 5.3	Describe the basic concepts of blockchain technology and cryptocurrency and explore their emerging role in digital banking and financial transactions.
PB 5.4	Explain the importance of cybersecurity in digital banking environments and identify key strategies used to protect financial data and systems from cyber threats.
PB 5.5	Evaluate how real-time payment systems (e.g., Zelle, ACH, RTP) are changing the banking system.

PB 6: Evaluate the impact of lending practices, credit strategies, and risk management as core functions of a financial institution.	
PB 6.1	Compare the key features, purposes, and repayment structures of consumer and commercial loans.
PB 6.2	Explain how banks assess borrowers and how credit scores, credit history, and other financial data are used in the underwriting process.
PB 6.3	Evaluate the financial and long-term impacts of mortgage and auto loans on consumers and explain how these loan products contribute to bank revenue.
PB 6.4	Explain how banks mitigate risk when issuing loans and managing financial portfolios.
PB 7: Plan, monitor, and manage the day-to-day activities within a financial organization to ensure secure operations.	
PB 7.1	Describe how security programs minimize the chance for loss.
PB 7.2	Demonstrate the proper procedures for cash transactions.
PB 7.3	Describe the loan application process to determine the creditworthiness of customers.
PB 7.4	Discuss real estate lending and servicing.
PB 7.5	Explore problem loan management and various remedies available.
PB 8: Utilize career-planning concepts, tools, and strategies to explore a career in financial services.	
PB 8.1	Describe the importance of ethical practices in the financial industry.
PB 8.2	Identify the knowledge and skills required for careers in the financial services industry.
PB 8.3	Explore the career opportunities that exist within the financial industry.

Business Economics - 12105	
BE 1: Analyze the basic economic systems in relation to scarcity, choice, and opportunity costs.	
BE 1.1	Analyze fundamental economic concepts and principles.
BE 1.2	Compare and contrast the characteristics of economic systems.
BE 1.3	Analyze the economic challenges and goals that influence societal decision-making.
BE 1.4	Assess the importance of resources and their relationship to economic decision-making.
BE 2: Evaluate the role of business in a global market.	
BE 2.1	Compare and contrast different types of business organizations.
BE 2.2	Apply the concepts of buying and selling stock.
BE 2.3	Analyze the effects of various types of competition on a global economic market.
BE 2.4	Differentiate between factors of production.
BE 2.5	Apply the concepts of marketing.
BE 2.6	Explain supply and demand curves and how scarcity and surplus impact the curves.
BE 3: Analyze the role of government in the global economic market.	
BE 3.1	Explain the government's role in a global economic market.
BE 3.2	Analyze the components of gross national product (GNP), gross domestic product (GDP), and national income.
BE 3.3	Identify the different types of taxes and list their effects on the economy.
BE 3.4	Analyze the stages of the business cycle and the impact of economic policy.
BE 3.5	Explore governmental policies and their economic consequences at the national, state, and local levels.
BE 4: Explore global economic concepts.	
BE 4.1	Analyze concepts as they apply to the global economy (e.g., outsourcing and imports/exports).
BE 4.2	Analyze the effect of global trade on the United States' economy.
BE 4.3	Develop a logical argument for/against protective trade barriers.
BE 4.4	Summarize business economic concepts to determine the advantages and disadvantages of international trade.
BE 4.5	Investigate and critique the purpose and effects of foreign aid.
BE 5: Explore careers in the financial services industry.	
BE 5.1	Identify careers in the financial services industry.
BE 5.2	Describe the essential knowledge and skills needed to be employed in the financial services industry.

Principles of Insurance - 12106	
PI 1: Identify the purpose of insurance.	
PI 1.1	Identify various risks that consumers and businesses encounter.
PI 1.2	Identify and differentiate the types of risk management methods.
PI 1.3	Compare the cost of insurance to the potential cost of an unexpected event without insurance.
PI 2: Distinguish between different types of insurance and coverage options.	
PI 2.1	Compare and contrast the different types of insurance (e.g., automobile, health, life, and homeowner's/renter's insurance coverage).
PI 2.2	Identify the various coverage options for the different types of insurance.
PI 3: Determine client needs and wants to guide purchase decisions and enhance future insurance business opportunities.	
PI 3.1	Construct an insurance plan tailored to meet a consumer's specific coverage needs.
PI 3.2	Evaluate existing client insurance and risk management needs.
PI 3.3	Describe the claims process and evaluate how insurance should cover the claim.
PI 4: Explain the laws and regulations that govern insurance industry transactions.	
PI 4.1	Define regulations that ensure compliance and adherence to insurance industry regulations.
PI 4.2	Apply legal concepts and ethics pertinent to the insurance industry.
PI 4.3	Define and explain the elements of negligence relating to insurance.
PI 4.4	Compare the goals of various consumer protection laws and how they relate to insurance.
PI 4.5	Identify various types of insurance fraud.
PI 5: Evaluate underwriting techniques and strategies to determine the risk posed by potential insurance clients.	
PI 5.1	Analyze the risk posed by potential clients to make insurance approval/denial decisions.
PI 5.2	Identify factors that influence the premium pricing of insurance.
PI 5.3	Explore technologies used by insurers to calculate risk.
PI 6: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in insurance.	
PI 6.1	Describe the essential knowledge and skills needed to be employed in the insurance industry.
PI 6.2	Explore opportunities, roles, and responsibilities associated with careers in the insurance industry.
PI 6.3	Explain the requirements and processes for obtaining insurance licensing and certification.

Investment Planning - 12107	
IP 1: Identify the goals of financial planning and their importance in wealth-building management.	
IP 1.1	Describe the different types of investment tools and their purposes.
IP 1.2	Explain why investments are a wealth-building tool.
IP 1.3	Analyze the different types of investment tools using the risk pyramid.
IP 2: Describe the laws and regulations that regulate transactions for securities and investments.	
IP 2.1	Explain the regulations and ethical practices of the securities and investments industry.
IP 2.2	Describe fundamental concepts of real estate law.
IP 2.3	Explain the nature and scope of ownership titling.
IP 2.4	Evaluate an asset appraisal to determine its value.
IP 3: Identify the financial tools used for securities and investments.	
IP 3.1	Explain securities and investment products and their benefits.
IP 3.2	Describe investment analysis and selection processes.
IP 3.3	Formulate investment options for clients.
IP 3.4	Evaluate the performance of an investment portfolio.
IP 3.5	Plan, monitor, and manage day-to-day securities and investments.
IP 4: Investigate strategies to educate and attract potential customers.	
IP 4.1	Apply strategies to attract prospective customers and grow a customer base.
IP 4.2	Apply concepts to counsel customers based on their financial goals.
IP 5: Explore careers in the securities and investments industry.	
IP 5.1	Identify careers in securities, investments, and real estate.
IP 5.2	Describe the essential knowledge and skills needed to be employed in the financial services industry.
IP 5.3	Summarize the requirements and processes for obtaining licensing and certifications for careers in the securities and investments industry.

Cross Cluster Standards also connected with the Financial Services Cluster	
Primary Cluster	**Course**
Management and Entrepreneurship	Business Computer Applications
Management and Entrepreneurship	Introduction to Business
Management and Entrepreneurship	Business Management
Management and Entrepreneurship	Business Law
Management and Entrepreneurship	Entrepreneurial Skills
AP (Advanced Placement) course standards are set by College Board	

SEQUENCE OF COURSES

HEALTH SCIENCE

CARING FOR COMMUNITIES

south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

APPROVED CLUSTER COURSES

HEALTH SERVICES PATHWAY

- 14001 Health Science Careers I- Exploration
- 14002 Health Science Careers II- Engagement
- 14154 Medical Terminology
- 14051 Gateway to Certified Nursing Assistant
- 14055 Introduction to Emergency Medical Services
- 14062 Introduction to Sports Medicine
- 14152 Introduction to Pharmacy Technician
- 14157 Intro to Health Informatics
- 14102 Introduction to Medical Diagnostics

BIOMEDICAL SCIENCE PATHWAY

- 14001 Health Sciences Careers I: Exploration
- 14002 Health Science Careers II: Engagement
- 14154 Medical Terminology
- 03066 Principles of Biomedical Science
- 03067 Human Body Systems
- 03068 Medical Intervention
- 03070 Biomedical Innovation

MENTAL AND BEHAVIORAL HEALTH PATHWAY

- 19001 Introduction to Human Services
- 19255 Relationships across the Lifespan
- 19264 Family and Community Resources
- 19301 Introduction to Behavioral and Mental Health

MIDDLE SCHOOL COURSES

- 0 3071 Middle School Biomedical
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

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INDUSTRY RECOGNIZED CREDENTIALS

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DUAL CREDIT COURSES

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POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Health Science

The Health Science Career Cluster prepares students for careers dedicated to improving the health and well-being of individuals and communities. Courses focus on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research. It equips individuals with the knowledge and hands-on skills needed to promote lifelong health and wellness or to treat injuries and diseases, while establishing the rigorous academic and practical foundations necessary for success in further post-secondary education and professional medical training.

Health Science Careers I - 14001	
HSC-I 1: Explore opportunities in healthcare careers.	
HSC-I 1.1	Explore various healthcare systems (e.g., clinics, hospitals, long-term, public, private).
HSC-I 1.2	Demonstrate proper communication with colleagues, patients/residents, and/or family members.
HSC-I 1.3	Recognize key professional qualities in a healthcare worker.
HSC-I 2: Identify career opportunities in health science and healthcare.	
HSC-I 2.1	Identify and compare health science career paths in biotechnology research & development, clinical health services, community health services, personal care services, and clinical mental health.
HSC-I 2.2	Explain levels of education and credentialing requirements for a variety of health science careers of interest.
HSC-I 2.3	Explore employment opportunities, workplace environments, and career growth potential.
HSC-I 2.4	Explore career and technical student organizations and other activities that will support a career path in healthcare.
HSC-I 3: Examine legal and ethical responsibilities and limitations of the healthcare worker.	
HSC-I 3.1	Understand legal, ethical, religious, and cultural issues and their impacts on health care.
HSC-I 3.2	Explore scope of practice state-specific requirements and a variety of professional standards (e.g., American Medical Association, American Nurses Association, American Dental Association).
HSC-I 3.3	Examine the implications of patient data protection and Health Insurance Portability and Accountability Act (HIPAA).
HSC-I 3.4	Discuss patients'/residents' Bill of Rights and advanced directives.
HSC-I 4: Demonstrate foundational healthcare safety procedures and patient care skills.	
HSC-I 4.1	Identify and prevent common safety hazards in the healthcare environment for patients and the healthcare worker (e.g., transfers, lifting, handwashing).
HSC-I 4.2	Practice basic intervention and assessment skills needed in healthcare (e.g., blood pressure, fevers, dressings, first aid, CPR).

HSC-I 4.3	Explore the importance of proper documentation and communication in healthcare careers.

Health Science Careers II - 14002	
HSC-II 1: Identify and apply principles of infection control.	
HSC-II 1.1	Explore how infections spread through the chain of infection.
HSC-II 1.2	Practice infection control methods to stop the spread of pathogens.
HSC-II 2: Discuss disease, diagnosis, and treatment.	
HSC-II 2.1	Use Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH) guidelines to explain how diseases are identified and categorized.
HSC-II 2.2	Demonstrate the ability to assess and monitor patient or resident health using appropriate tools and techniques.
HSC-II 2.3	Explore how modern medical treatments help people manage diseases (e.g., cancer, heart disease, obesity, diabetes, asthma).
HSC-II 3: Demonstrate hands-on patient/resident care skills.	
HSC-II 3.1	Apply procedures for monitoring, measuring, and recording vital signs.
HSC-II 3.2	Demonstrate appropriate emergency response techniques, including First Aid, Cardiopulmonary Resuscitation (CPR), and the operation of an Automated External Defibrillator (AED), to effectively manage life-threatening situations.
HSC-II 3.3	Practice direct patient/resident care skills.
HSC-II 4: Demonstrate documentation standards and findings.	
HSC-II 4.1	Demonstrate use of technological documentation standards by entering data on the electronic medical record or paper.
HSC-II 4.2	Differentiate between subjective and objective healthcare data to communicate patient/resident status.
HSC-II 5: Utilize medical mathematics skills needed in healthcare work.	
HSC-II 5.1	Apply mathematical computations related to healthcare procedures.
HSC-II 5.2	Analyze diagrams, charts, graphs, and tables to interpret healthcare data.

Gateway to Certified Nursing Assistant - 14051	
GCNA 1: Discuss the Certified Nursing Assistant (CNA) certification process and the roles of the CNA in the healthcare environment.	
GCNA 1.1	Discuss laws and regulations that govern the work and certification of nursing assistants.
GCNA 1.2	Identify the job duties and requirements of a nursing assistant.
GCNA 2: Discuss basic medical terminology, vocabulary, equipment, anatomical body systems, and common diseases.	
GCNA 2.1	Demonstrate proficiency in medical terminology, vocabulary, abbreviations, and equipment relevant to a CNA.
GCNA 2.2	Describe anatomical body systems relevant to a CNA.
GCNA 2.3	Describe common diseases encountered by a CNA.
GCNA 3: Identify and implement principles related to infection control and basic safety/emergency situations.	
GCNA 3.1	Demonstrate the CNA role in infection control procedures in reference to the Centers for Disease Control and Prevention (CDC), the Occupational Safety and Health Administration (OSHA), and National Institutes of Health (NIH).
GCNA 3.2	Discuss and demonstrate safety/emergency protocols and procedures within the healthcare environment.
GCNA 4: Measure and record a patient/resident's health-related vital data/statistics.	
GCNA 4.1	Collect and document baseline information, including vital signs, height, and weight.
GCNA 4.2	Identify normal ranges for vital signs and list factors that can affect vital signs.
GCNA 4.3	Document patient data to include Activities of Daily Living (ADLs), condition progress, and care management actions.
GCNA 5: Understand a patient/resident's environment, basic human needs, and the importance of hygiene.	
GCNA 5.1	Identify basic physical human needs and ADLs of a patient/resident.
GCNA 5.2	Identify a patient/resident's psychosocial needs.
GCNA 6: Understand care involving cognitive impairment, mental illness, and death and dying.	
GCNA 6.1	Identify effective strategies when caring for cognitively altered and mentally ill patients.
GCNA 6.2	Summarize the basic needs and care during a patient/resident's death and the grieving process.

Introduction to Emergency Medical Services - 14055	
EMS 1: Explore roles, responsibilities, and professionalism of Emergency Medical Services (EMS) personnel.	
EMS 1.1	Distinguish differences among careers within EMS and explain in detail the education level and credentialing/licensure requirements.
EMS 1.2	Describe emergency care and emotional support for patients, bystanders, or other responders.
EMS 1.3	Investigate medical and legal standards in correlation with the Health Insurance Portability and Accountability Act (HIPAA).
EMS 1.4	Identify the various levels and types of personal protective equipment (PPE) that are incorporated into care management of medical and trauma conditions by an EMS provider.
EMS 1.5	Investigate the human body and the correlation of anatomy and physiology to various medical and trauma conditions.
EMS 1.6	Distinguish the components of completing a medical assessment and a trauma assessment of a patient.
EMS 2: Demonstrate skills for certification standards set by the American Heart Association or the American Red Cross.	
EMS 2.1	Demonstrate how to perform First Aid.
EMS 2.2	Demonstrate how to perform Cardiopulmonary Resuscitation (CPR).
EMS 2.3	Demonstrate how to use an Automated External Defibrillator (AED).
EMS 3: Determine the necessity of emergency medical care for a variety of patients with varied medical conditions.	
EMS 3.1	Identify emergency medical services treatment protocols.
EMS 3.2	Identify medical and trauma emergencies requiring clinical care and management by an EMS provider.
EMS 3.3	Investigate the use of EMS equipment while identifying appropriate application for specific clinical conditions.
EMS 3.4	Describe how to perform naloxone administration for an opioid overdose.
EMS 3.5	Demonstrate how to perform bleeding control utilizing concepts from Stop the Bleed (e.g., wound packing, dressings, and tourniquet application).

Introduction to Sports Medicine - 14062	
ISM 1: Identify the fundamental aspects of medical terminology, the human body systems, kinesiology, and careers related to sports medicine.	
ISM 1.1	Describe the history of sports medicine.
ISM 1.2	Distinguish the differences among careers within sports medicine and explain in detail the education level and credentialing/licensure requirements.
ISM 1.3	Interpret medical terms and abbreviations to communicate information.
ISM 1.4	Identify basic structures and functions of human body systems.
ISM 2: Understand injury prevention principles and performance enhancement philosophies.	
ISM 2.1	Develop a nutrition and hydration plan for an athlete that addresses personal healthy behaviors.
ISM 2.2	Explore and identify safe training practices in sports medicine.
ISM 2.3	Compare and contrast performance enhancement philosophies.
ISM 3: Explore common sports injuries, injury management, and treatment techniques.	
ISM 3.1	Recognize and explain common injuries and conditions that impact physical activity.
ISM 3.2	Analyze common sports injuries to differentiate treatment modalities.
ISM 3.3	Create an emergency action plan.
ISM 3.4	Perform proper treatment techniques for common sports injuries through hands-on application (e.g., taping, wrapping, and bracing).
ISM 3.5	List and describe the signs and symptoms of a concussion and demonstrate concussion recognition.
ISM 4: Explore the psychological impact of injury and the healing process on an individual.	
ISM 4.1	Describe basic principles of performance psychology.
ISM 4.2	Explain possible adaptations that can be made to exercise programs to account for different clients' needs.

Introduction to Medical Diagnostics - 14102	
IMD 1: Investigate careers in medical diagnosis.	
IMD 1.1	Compare and contrast the scope of practice of diagnostic careers (e.g., diagnostic lab, imaging professionals).
IMD 1.2	Identify education, licensure, registration, or certification requirements for specific careers in diagnostic medicine.
IMD 1.3	Identify workforce demand, workplace settings, and compensation.
IMD 2: Recognize skills necessary to work in any healthcare facility.	
IMD 2.1	Summarize the Health Insurance Portability and Accountability Act (HIPAA) and requirements for privacy and security of healthcare information.
IMD 2.2	Identify industry safety standards.
IMD 2.3	Recognize key professional qualities in a healthcare worker.
IMD 3: Understand the dynamics of a healthcare diagnostic workplace.	
IMD 3.1	Identify workplace equipment, protocol, and procedures.
IMD 3.2	Apply skills related to the medical diagnostic field.
IMD 3.3	Explore emerging technologies used in the medical diagnostic field.
IMD 3.4	Correlate results to symptoms and conditions.

Introduction to Pharmacy Technician - 14152	
IPT 1: Examine the roles and responsibilities of the pharmacy technician and governing laws.	
IPT 1.1	Understand the roles and responsibilities of a pharmacy technician.
IPT 1.2	Interpret the laws and regulations involved in dispensing medication, including controlled substances.
IPT 1.3	Apply the requirements for dispensing medication in accordance with federal and South Dakota law.
IPT 1.4	List the various types of reimbursement for prescription coverage.
IPT 2: Understand safety measures as they pertain to preparing prescriptions and maintaining inventory.	
IPT 2.1	Identify the steps involved in preparing and processing prescriptions.
IPT 2.2	Apply safety measures to prevent prescription errors and recognize the importance of reporting errors.
IPT 2.3	Identify the process of maintaining pharmacy inventory.
IPT 3: Understand drug dosage calculations and preparation of prescriptions.	
IPT 3.1	Solve dimensional math problems and calculations.
IPT 3.2	Convert between metric and apothecary measurements.
IPT 3.3	Calculate dosage.
IPT 3.4	Identify characteristics of dosage forms.
IPT 3.5	Identify common terminology and abbreviations related to pharmacy.

Medical Terminology - 14154	
MT 1: Build and interpret medical terminology.	
MT 1.1	Decipher and create medical terms using word roots, prefixes, and suffixes.
MT 1.2	Practice the correct spelling and pronunciation of medical terminology.
MT 1.3	Communicate patient/resident care information utilizing medical terminology.
MT 2: Demonstrate use of medical terminology in relation to the human body.	
MT 2.1	Utilize medical terminology associated with the human body, medical healthcare treatment, and diagnostics.
MT 2.2	Understand body planes, directional terms, quadrants, and cavities using medical terminology.
MT 3: Utilize medical terminology to identify and interpret signs and symptoms of diseases and disorders.	
MT 3.1	Compare and contrast symptoms of diseases and disorders using medical terminology.
MT 3.2	Utilize medical terminology pertaining to the diagnosis and treatment of diseases and disorders in patients/residents.
MT 4: Apply medical terminology and abbreviations to health records and clinical documentation.	
MT 4.1	Define basic terms and abbreviations used in documenting health records.
MT4.2	Document common terms and abbreviations in health records related to the major systems of the body.

Introduction to Health Informatics - 14157	
IHI 1: Describe techniques to accurately collect and maintain patient data throughout the data management lifecycle.	
IHI 1.1	Describe the data management lifecycle including collection, storage, retention, and destruction of data.
IHI 1.2	Design a data collection screen using human factors, engineering concepts, a data dictionary, and a small, populated database using a database management system for social determinants of health data.
IHI 1.3	Design a clear and easy-to-use form to collect health-related data and build a database to organize and explain the information using a database program.
IHI 1.4	Identify common data integrity principles including timeliness, accuracy, and completeness of documentation.
IHI 1.5	Describe the importance of compliance with data integrity principles.
IHI 1.6	Identify techniques to ensure compliance with Health Insurance Portability and Accountability Act (HIPAA) regulations for privacy and security.
IHI 2: Demonstrate data analysis and visualization techniques used for healthcare decision making.	
IHI 2.1	Use technology to visualize and analyze trends in healthcare data.
IHI 2.2	Using a database management system, analyze a social determinant of health dataset to identify public health issues and create a report of trends.
IHI 2.3	Identify and apply accurate medical terminology.
IHI 2.4	Investigate the need for requesting further clarification when transcribing/transferring information that may be unclear.
IHI 2.5	Analyze and apply information for regulatory and legal purposes.
IHI 3: Explore the use of health informatics and other technologies used in healthcare delivery processes.	
IHI 3.1	Describe the design, implementation, and use of the Electronic Health Record (EHR) systems, clinical decision support tools, and other technologies in healthcare used to enhance patient care processes and improve outcomes.
IHI 3.2	Identify how clinical decision support tools can reduce errors and improve patient safety.
IHI 3.3	Identify health information exchange standards for sharing patient information.
IHI 3.4	Explore the use of Artificial Intelligence (AI) for documenting patient care using technology such as ambient scribes.
IHI 3.5	Explore the technology used to provide care remotely and monitor patient health data.
IHI 3.6	Explore the pros and cons of Artificial Intelligence (AI) use in healthcare for diagnosis, treatment, and patient care planning.
IHI 3.7	Categorize user access to electronic health record data to demonstrate HIPAA requirements for minimum necessary access.

Introduction to Behavioral and Mental Health - 19301	
IBMH 1: Evaluate the impact of behavioral and mental health on society and current health and wellness trends.	
IBMH 1.1	Define behavioral and mental health and explain the differences between them.
IBMH 1.2	Identify current behavioral and mental health issues and how they impact society.
IBMH 1.3	Interpret the historical overview and development of behavioral and mental health in the United States.
IBMH 1.4	Evaluate how mental health connects to overall wellness and current health trends.
IBMH 2: Interpret behavioral health-related medical terms.	
IBMH 2.1	Use medical language in behavioral and mental health.
IBMH 2.2	Identify common prefixes, word roots, and suffixes.
IBMH 2.3	Construct basic behavioral and mental health vocabulary terms.
IBMH 2.4	Explain why using standardized terminology is important for communication and care.
IBMH 2.5	Use appropriate medical terminology that identifies diagnoses as conditions rather than defining an individual by the disorder. (ie: a person has bipolar disorder, not "they are bipolar")
IBMH 3: Explore careers in behavioral and mental health.	
IBMH 3.1	Identify different careers in behavioral and mental health (e.g., psychologists, psychiatrists, psychiatric physician assistants, psychiatric nurses, counselors and licensed mental health practitioners, licensed drug and alcohol counselors, marriage and family counselors, direct care professionals, school psychologists, and social workers).
IBMH 3.2	Describe the education, training, and licensure requirements of mental and behavioral health providers.
IBMH 3.3	Explain what professionals providing behavioral and mental health services do and how they support wellness.
IBMH 3.4	Demonstrate personal characteristics necessary to excel at providing mental health services.
IBMH 4: Examine how behavioral and mental health is part of whole-person healthcare.	
IBMH 4.1	Discuss how services can be offered alongside primary care.
IBMH 4.2	Explore the pros and cons of combining physical and mental health services.
IBMH 4.3	Compare the different levels of mental and behavioral health care (e.g., outpatient therapy, intensive day programs, inpatient treatment, and virtual care options).

Principles of Biomedical Science - 03066	
PBM 1: Investigate forensic science and medical examination.	
PBM 1.1	Explore biological and forensic science careers.
PBM 1.2	Understand experimental design and data analysis.
PBM 1.3	Examine biomolecules.
PBM 1.4	Discuss human anatomy, physiology, and causes of death.
PBM 1.5	Practice synthesizing forms of data.
PBM 1.6	Develop professional communication skills.
PBM 2: Examine the roles of a medical professional working in clinical care.	
PBM 2.1	Explore medical careers.
PBM 2.2	Demonstrate effective healthcare communication using medical and technical terminology.
PBM 2.3	Collect, record, and interpret physiological data.
PBM 2.4	Perform and evaluate medical tests.
PBM 2.5	Describe cutting-edge technologies in healthcare.
PBM 2.6	Discuss body systems and their correlation with each other.
PBM 2.7	Explore causes and inheritance of disease.
PBM 3: Identify outbreaks and emergencies.	
PBM 3.1	Explore careers in public health and emergency medicine.
PBM 3.2	Describe how to process data.
PBM 3.3	Explore the process of medical emergency declaration.
PBM 3.4	Recognize contagious diseases.
PBM 4: Design a medical innovation.	
PBM 4.1	Recognize experimental and engineering processes.
PBM 4.2	Determine solutions for current and emerging issues.
PBM 4.3	Explore how computer-aided design (CAD) and geographic information systems (GIS) contribute to innovation in healthcare.

Human Body Systems - 03067	
HBS 1: Determine rehabilitation methods used to care for a patient.	
HBS 1.1	Investigate the structure and function of the human body.
HBS 1.2	Examine the role of muscles.
HBS 1.3	Recommend a personalized care and rehabilitation plan for a patient.
HBS 2: Research the nervous and endocrine systems.	
HBS 2.1	Explore the nervous systems.
HBS 2.2	Identify the role of the endocrine system.
HBS 2.3	Complete a research experiment.
HBS 3: Summarize the cardiovascular, respiratory, and immune systems.	
HBS 3.1	Investigate the roles of the cardiovascular system.
HBS 3.2	Determine the role of the respiratory system.
HBS 3.3	Identify how the immune system protects the body.
HBS 3.4	Recognize how environments can impact cardiovascular, respiratory, and immune systems.
HBS 4: Develop an interactive exhibit to spotlight the function of the urinary and digestive systems.	
HBS 4.1	Examine the renal system.
HBS 4.2	Discuss the digestive system.
HBS 4.3	Perform a urinalysis.
HBS 4.4	Perform a laboratory test to show enzyme function in the breakdown of food.

Medical Interventions - 03068	
MI 1: Investigate infectious disease.	
MI 1.1	Examine the diagnostic process to identify infection.
MI 1.2	Explore antibodies used to treat infection.
MI 1.3	Discuss antibiotic resistance to medication.
MI 1.4	Describe the role infection can have on hearing impairment.
MI 1.5	Identify the development of vaccinations.
MI 2: Describe genetic testing.	
MI 2.1	Examine types of genetic testing and screenings.
MI 2.2	Discuss the ethical implications of genetic testing.
MI 3: Examine cancer.	
MI 3.1	Recognize the diagnostic processes for identifying cancerous cells.
MI 3.2	Identify risk factors.
MI 3.3	Discuss the prevention of cancer.
MI 3.4	Evaluate treatments for cancer.
MI 3.5	Summarize the process for new and innovative treatment.
MI 3.6	Determine the types of rehabilitation after cancer.
MI 4: Examine organ failure.	
MI 4.1	Recognize the role protein production has in organ failure.
MI 4.2	Identify methods to regulate blood glucose levels.
MI 4.3	Discuss organ donation and treatment.
MI 4.4	Investigate techniques for building a better body.

Biomedical Innovation - 03070	
BI 1: Evaluate patient care in an emergency medicine setting.	
BI 1.1	Apply knowledge of emergency medical careers.
BI 1.2	Recognize the role of diagnostic testing and patient evaluation.
BI 1.3	Apply knowledge of the systems of the human body.
BI 1.4	Analyze medical interventions.
BI 1.5	Identify inefficiencies that may hinder clinical care.
BI 2: Explore human physiology.	
BI 2.1	Design an experimental study.
BI 2.2	Conduct the experimental study.
BI 2.3	Analyze the experimental study.
BI 3: Design a medical innovation.	
BI 3.1	Review the evolution of biomedical products.
BI 3.2	Discuss ideas for a new biomedical product.
BI 3.3	Evaluate ways to improve an existing biomedical product.
BI 3.4	Identify design solutions.
BI 4: Examine environmental health.	
BI 4.1	Describe the impact on human health from chemicals or substances found in the environment.
BI 4.2	Test water samples.
BI 4.3	Explore toxicology.
BI 4.4	Design an environmental health profile and action plan.
BI 5: Evaluate a public health issue.	
BI 5.1	Review public health, epidemiology, and disease diagnosis.
BI 5.2	Create a hypothesis by diagnosing a patient.
BI 5.3	Recognize ways to identify a pathogen.
BI 5.4	Create a mini-grant proposal to combat a public health crisis including intervention strategies.
BI 6: Determine the process of a forensic autopsy.	
BI 6.1	Conduct a simulated forensic autopsy in a lab setting (e.g., fetal pig, virtual dissections, or models).

BI 6.2	Apply knowledge of human body systems to design a fictional death case.
BI 6.3	Prepare medical documentation that explains the circumstances and medical factors leading to an individual's death.

Cross Cluster Standards also connected with the Health Science Cluster	
Primary Cluster	**Course**
Human Services	Introduction to Human Services - 19001
Human Services	Relationships across the Lifespan - 19255
Human Services	Family and Community Resources - 19264

SEQUENCE OF COURSES

HOSPITALITY, EVENTS AND TOURISM

CREATING AND EXPERIENCING



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APPROVED CLUSTER COURSES

RESTAURANT AND FOOD SERVICE MANAGEMENT PATHWAY

- 16001 Introduction to Hospitality and Tourism
- 16052 Introduction to Food Concepts
- 16053 Culinary Arts I
- 16055 Culinary Arts II
- 16056 Culinary Arts III
- 16152 Event Management
- 19253 Nutrition & Wellness
- 19254 Food Science and Technology
- 16054 Community Nutrition

TRAVEL AND TOURISM PATHWAY

- 16001 Introduction to Hospitality and Tourism
- 16051 Foundations of Travel and Tourism
- 16152 Event Management

MIDDLE SCHOOL COURSES

- 19000 Grades 5-8 Family and Consumer Science
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Cluster

Hospitality, Events, and Tourism

The Hospitality, Events, & Tourism Career Cluster encompasses a broad range of services and experiences related to food and beverage, lodging, travel, events, and conferences. This Cluster focuses on careers delivering quality customer service, memorable experiences, and seamless logistics to cater to the needs and preferences of guests, tourists, and event participants. The Hospitality, Events and Tourism Cluster is an integral part of a comprehensive Family and Consumer Sciences Cluster.

Introduction to Hospitality, Events, and Tourism - 16001	
IHT 1: Identify careers within the hospitality, events, and tourism industries.	
IHT 1.1	Describe workplace skills necessary to be successful in the hospitality, events, and tourism industries.
IHT 1.2	Investigate opportunities for careers and advancement in the hospitality, events, and tourism industries.
IHT 1.3	Explore post-secondary training options for careers in hospitality, events, and tourism industries.
IHT 2: Examine safety, security, and environmental issues related to hospitality, events, and tourism industries.	
IHT 2.1	Identify industry standards and certifications that comply with safety policies and procedures (e.g., OSHA, equipment, handwashing, HR, etc.).
IHT 2.2	Explore systems used to protect employees and customers in hospitality, events, and tourism settings.
IHT 2.3	Identify common environmental challenges in hospitality (e.g., food waste, single-use plastics, recycling, energy consumption).
IHT 3: Summarize concepts of customer service.	
IHT 3.1	Examine the impact customer service has on success in the hospitality, events, and tourism industries.
IHT 3.2	Distinguish how customer service processes differ between in-person and virtual interactions to meet customer expectations.
IHT 3.3	Examine industry standards and best practices for customer service in hospitality, events, and tourism.
IHT 4: Investigate ethical and legal responsibilities of the hospitality, events, and tourism industry.	
IHT 4.1	Investigate issues related to confidentiality and ethics in the hospitality and tourism industry.
IHT 4.2	Describe legal rights and responsibilities of hospitality and tourism employees and guests.

IHT 5: Explore skills and practices required for careers in the hospitality, events, and tourism industries.	
IHT 5.1	Explore skills needed in hospitality and lodging careers.
IHT 5.2	Explore skills needed in restaurant and food service careers.
IHT 5.3	Explore skills needed in event management.
IHT 5.4	Explore skills for recreation, travel, and tourism services.

Introduction to Food Concepts - 16052	
IFC 1: Evaluate factors that influence food concepts.	
IFC 1.1	Explore global food cultures.
IFC 1.2	Examine the history and origin of food concepts.
IFC 1.3	Examine the impact of environment on food concepts.
IFC 1.4	Discuss future food concepts and trends.
IFC 2: Demonstrate food safety and sanitation procedures.	
IFC 2.1	Apply established safety rules and guidelines to maintain a safe working environment.
IFC 2.2	Identify proper first-aid procedures for cuts, burns, and electrical shock.
IFC 2.3	Identify health and hygiene best practices for food handling (e.g., handwashing, grooming, and hygiene).
IFC 2.4	Apply sanitation rules and regulations.
IFC 2.5	Identify methods that prevent foodborne illnesses and contamination.
IFC 3: Apply skills related to kitchen equipment and management.	
IFC 3.1	Identify types, use, and care of kitchen equipment.
IFC 3.2	Identify food measurement terminology and abbreviations.
IFC 3.3	Demonstrate proper measuring techniques.
IFC 3.4	Apply mathematical concepts through equivalents, recipe adjustments, and conversions.
IFC 3.5	Identify basic food preparation terminology.
IFC 3.6	Practice management skills (e.g., shopping lists, table settings, time management, budgeting).
IFC 4: Apply food selection and preparation guidelines while preparing foods.	
IFC 4.1	Identify components of selecting food products.
IFC 4.2	Demonstrate preparation methods for basic food products (e.g., quick breads, yeast breads, eggs, fruit smoothies, soups, salads, open-faced sandwiches).
IFC 4.3	Explore the scientific principles of cooking, baking, food preparation, and storage.
IFC 5: Identify dietary concerns and their impact on nutrition and health.	
IFC 5.1	Demonstrate an understanding of food allergies, food sensitivities, and dietary restrictions.
IFC 5.2	Interpret information on food packaging to make decisions about food.
IFC 6: Identify careers within the food service industry.	
IFC 6.1	Recognize career potential within the food service industry.
IFC 6.2	Explore education and training opportunities in the food service industry.

Culinary Arts I - 16053	
CA1 1: Identify career paths and professional practices within the food production and food service industries.	
CA1 1.1	Identify career potential and entrepreneurial endeavors.
CA1 1.2	Explain roles, duties, and functions of individuals engaged in food production and service careers.
CA1 1.3	Develop professional habits required by the food service industry.
CA1 2: Demonstrate food and workplace safety and sanitation procedures.	
CA1 2.1	Apply sanitation procedures to ensure compliance with health codes.
CA1 2.2	Categorize potentially hazardous foods and food preparation practices.
CA1 2.3	Apply proper food handling techniques.
CA1 2.4	Apply safety procedures to maintain a safe work environment.
CA1 2.5	Identify and correct workplace hazards.
CA1 3: Demonstrate industry standards in selecting, using, and maintaining food production, food service equipment, and tools.	
CA1 3.1	Identify types of equipment and tools used in food production and the intended use.
CA1 3.2	Recognize when tools and equipment need to be repaired or maintained.
CA1 3.3	Demonstrate professional skills in safe handling of knives, tools, and equipment before use.
CA1 3.4	Identify proper cleaning and storage of equipment.
CA1 4: Apply basic menu planning composition and plating concepts	
CA1 4.1	Describe menu composition.
CA1 4.2	Identify the purpose of food presentation and menu planning.

Culinary Arts II - 16055	
CA2 1: Exhibit professional practices to prepare for careers in the food service industry.	
CA2 1.1	Demonstrate professional practices in the lab setting or food service experience.
CA2 1.2	Identify emerging careers or entrepreneurship opportunities in the food service.
CA2 2: Demonstrate food and workplace safety and sanitation procedures.	
CA2 2.1	Apply sanitation procedures to comply with health codes.
CA2 2.2	Apply proper food handling techniques.
CA2 2.3	Apply safety procedures and correct workplace hazards to maintain a safe work environment.
CA2 3: Demonstrate menu planning principles and techniques based on standardized recipes to meet customer needs.	
CA2 3.1	Apply menu planning principles to develop and modify menus.
CA2 3.2	Identify needs for food, equipment, and supplies to meet production requirements.
CA2 3.3	Apply principles of measurement, portion control, conversions, food-cost analysis and control, menu terminology, and menu pricing to menu planning.
CA2 3.4	Design a variety of menu layouts, themes, and design styles.
CA2 3.5	Explore nutritional needs and their significance to the food service industry.
CA2 3.6	Explore emerging trends and fads in the food service industry.
CA2 4: Demonstrate professional food preparation methods and techniques for menu categories to produce food products that meet customer needs.	
CA2 4.1	Apply *mise en place* (the concept of putting everything in its place).
CA2 4.2	Execute knife cuts.
CA2 4.3	Select appropriate cooking techniques.
CA2 4.4	Apply fundamentals of time, temperature, and cooking methods to cooking, cooling, reheating, and holding of foods.
CA2 4.5	Prepare food products using professional techniques.
CA2 4.6	Demonstrate professional plating, garnishing, and food presentation techniques.
CA2 5: Implement food service management skills, leadership functions, and marketing strategies.	
CA2 5.1	Apply management principles of the food service industry.
CA2 5.2	Explore sustainability in the food service industry.
CA2 5.3	Implement team-building strategies.
CA2 5.4	Explore human resource policies, rules, regulations, and laws.

CA2 5.5	Utilize interpersonal skills to resolve conflicts.
CA2 5.6	Create a marketing plan.

Culinary Arts III - 16056	
CA3 1: Explore business opportunities in the food service industry.	
CA3 1.1	Research career and entrepreneurial opportunities in the food service industry.
CA3 1.2	Explore professional organizations and industry certifications in the food service industry.
CA3 2: Apply food safety principles to the food service industry.	
CA3 2.1	Apply Hazard Analysis Critical Control Points (HACCP) to the flow of food.
CA3 2.2	Research state and federal health laws related to the food service industry.
CA3 2.3	Examine the benefits of Industry Recognized Credentials and how they are required in food safety laws and regulations.
CA3 3: Research advanced techniques in food production.	
CA3 3.1	Investigate concepts of sustainability practices.
CA3 3.2	Explore innovations in the food service industry.
CA3 3.3	Implement advanced techniques in food production.
CA3 4: Apply advanced techniques and knowledge to a culminating experience.	
CA3 4.1	Create a plan for a culminating experience.
CA3 4.2	Demonstrate effective marketing strategies in the food service industry.
CA3 4.3	Implement the culminating experience with industry support.

Foundations of Travel and Tourism - 16151	
HTL 1: Explore the experience, destination, and attractions that drive South Dakota's tourism economy.	
HTL 1.1	Examine the different facets of tourism in South Dakota (e.g., agritourism, hunting and fishing, natural resources and parks, cultural, sports, historical, etc.).
HTL 1.2	Examine factors that affect the visitor experience (e.g. destinations, attractions, lodging, dining, events, retail, and transportation).
HTL 1.3	Describe the economic benefits of specific tourism events, attractions, and activities in South Dakota.
HTL 1.4	Investigate emerging trends and opportunities that could shape the future of tourism.
HTL 2: Discover the people and careers that bring memorable visitor experiences to life.	
HTL 2.1	Explore current and emerging career opportunities in tourism, guest services, attractions, recreation, marketing, and event production.
HTL 2.2	Identify the personal and professional skills needed to create positive experiences for visitors and customers.
HTL 2.3	Investigate opportunities for careers and advancement in the hospitality, events, and tourism industries.
HTL 3: Examine how lodging and guest accommodations create distinctive visitor experience.	
HTL 3.1	Identify lodging classifications and types of accommodations (e.g. include hotels, motels, resorts, hunting lodges, campgrounds, casino hotels, hostels, spas, extended stay, time shares, short-term rentals).
HTL 3.2	Examine how independently owned, chain-affiliated, franchised, and corporate properties differ in ownership, operations, branding, and guest experiences.
HTL 3.3	Analyze how amenities and services impact customer service and satisfaction (e.g., pool, restaurant, concierge, busser, Wi-Fi, shuttle service, parking, etc.).
HTL 4: Apply communication, leadership, and customer service skills essential to hospitality, lodging, and tourism operations.	
HTL 4.1	Demonstrate customer service and professional behaviors to ensure guest satisfaction.
HTL 4.2	Apply strategies for welcoming guests, anticipating needs, and solving problems.
HTL 4.3	Evaluate how positive and negative guest experiences affect a business.
HTL 4.4	Summarize leadership and teamwork qualities necessary to organizational success.
HTL 5: Examine safety, security, legal, and ethical responsibilities in hospitality, lodging, and tourism operations.	
HTL 5.1	Investigate safe working habits and security procedures.
HTL 5.2	Summarize safety, security, and emergency policies and procedures.
HTL 5.3	Identify ethical and legal responsibilities across operations.
HTL 5.4	Examine sustainability practices in hospitality, lodging, and tourism.

HTL 6: Investigate marketing and promotional strategies used in the hospitality, lodging, and tourism industry.	
HTL 6.1	Identify common marketing and promotional methods used in the tourism industry.
HTL 6.2	Explore the impact of data collection on the tourism industry, marketing strategies, and industry shifts.
HTL 6.3	Recognize target audiences for tourism products, services, and destinations.
HTL 6.4	Examine the use of social media, websites, travel guides, and digital platforms in hospitality, lodging, and tourism promotions.

Event Management - 16152	
EM 1: Analyze career opportunities in event planning and management.	
EM 1.1	Identify and compare career paths in event planning and management.
EM 1.2	Explore and demonstrate knowledge of employment opportunities, workplace environments, and career growth potential.
EM 1.3	Assess personal and technical characteristics necessary for career success in event planning.
EM 2: Explore professional roles and responsibilities of event planning.	
EM 2.1	Explore similarities and differences of events.
EM 2.2	Investigate components of the event planning process.
EM 2.3	Explore forms, records, and contracts related to event planning.
EM 2.4	Discuss legal, ethical, safety, and security responsibilities of event planners.
EM 3: Create an event proposal.	
EM 3.1	Identify the purpose of the event.
EM 3.2	Identify client needs, wants, and expectations.
EM 3.3	Create a budget based upon client input.
EM 3.4	Determine event logistics.
EM 3.5	Present a proposal for client feedback.
EM 4: Execute a planned event.	
EM 4.1	Utilize professional skills and attributes in event implementation.
EM 4.2	Demonstrate teamwork, problem-solving, and decision-making skills in implementing the planned event.
EM 4.3	Demonstrate conflict resolution strategies in managing events.
EM 5: Evaluate completed event.	
EM 5.1	Develop a process for the event evaluation.
EM 5.2	Critique event implementation.

Food Science and Technology - 19254	
FST 1: Integrate knowledge, skills, and practices required for careers in food science, food processing and food production.	
FST 1.1	Determine the contributions of food science to society.
FST 1.2	Summarize food science in relation to social trends and technological advances.
FST 1.3	Explain contributions of food science to changing food quality and availability.
FST 1.4	Investigate careers in food science, food processing, and food production industries.
FST 2: Explore scientific practices as they relate to the food industry.	
FST 2.1	Demonstrate safe laboratory practices.
FST 2.2	Apply skills needed for valid and reliable scientific experiments.
FST 3: Demonstrate food safety and sanitation procedures.	
FST 3.1	Practice procedures that minimize the risks of foodborne illness.
FST 3.2	Differentiate how microorganisms act in food and their effect on food products.
FST 3.3	Classify sources of contamination: chemical, physical, and biological.
FST 4: Investigate physical and chemical changes of food composition.	
FST 4.1	Differentiate roles of the three phases of water in food preparation, food processing, and food safety.
FST 4.2	Investigate changes of macronutrients in food processing and preparation.
FST 4.3	Investigate changes of micronutrients in food processing and preparation.
FST 5: Utilize the role of sensory evaluation in the food industry.	
FST 5.1	Differentiate sensory characteristics that affect food preferences.
FST 5.2	Implement procedures for evaluation of sensory characteristics.
FST 6: Investigate technological advances in food science, food processing, and food production.	
FST 6.1	Distinguish scientific advances that have changed the food supply and preparation.
FST 6.2	Investigate use of technology in new food product development.

Cross Cluster Standards also connected with the Health Science Cluster	
Primary Cluster	**Course**
Human Services	Community Nutrition - 16054
Human Services	Nutrition and Wellness - 19254

SEQUENCE OF COURSES

HUMAN SERVICES

CARING FOR COMMUNITIES



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APPROVED CLUSTER COURSES

COMMUNITY AND SOCIAL SERVICES PATHWAY

- 19001 Introduction to Human Services
- 19264 Family and Community Resources
- 16054 Community Nutrition
- 19261 Human Dev: Understanding Adulthood and Aging
- 19255 Relationships across the Lifespan
- 16052 Introduction to Food Concepts
- 19253 Nutrition & Wellness

BEHAVIORAL AND MENTAL HEALTH PATHWAY

- 19001 Introduction to Human Services
- 19255 Relationships across the Lifespan
- 19264 Family and Community Resources
- 19301 Introduction to Behavioral and Mental Health

EARLY CHILDHOOD DEVELOPMENT CAREER PATHWAY

- 19001 Introduction to Human Services
- 19051 Human Dev: Preschool to School Age
- 19052 Human Development: Prenatal to Toddlers
- 19151 Introduction to Education and Training
- 19152 SD Educators for Tomorrow
- 19153 Gateway to the Child Development Associate (CDA)

MIDDLE SCHOOL COURSES

- 19000 Grades 5-8 Family and Consumer Science
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

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- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
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Career Cluster

Human Services

The Human Services Career Cluster focuses on building the skills, compassion, and professional mindsets needed to support the well-being of individuals, families, and communities. It prepares learners to guide, advocate, and assist others through strong foundations in counseling skills, social support practices, community services, and human development. Careers in this cluster include social workers, counselors, community support specialists, and other professionals who provide assistance, advocacy, and resources to help people meet daily needs and improve quality of life. The Human Services Cluster is an integral part of a comprehensive Family and Consumer Sciences Cluster.

Introduction to Human Services -19001	
HS 1: Explore current issues for individuals, families, and communities.	
HS 1.1	Explore external factors affecting health, such as access to healthy foods, income and poverty, adequate childcare, transportation, healthcare, and education.
HS 1.2	Discover and review examples of needs assessments across a variety of communities.
HS 1.3	Investigate support systems and resources for individuals, families, and communities across the lifespan.
HS 2: Investigate careers in community and social services.	
HS 2.1	Examine different career opportunities in community and social services.
HS 2.2	Investigate paths that lead to careers in community and social services.
HS 2.3	Compare and contrast practice settings in community and social services.
HS 3: Investigate careers in behavioral and mental health.	
HS 3.1	Explore current ethical, legal, safety, and cultural guidelines in behavioral and mental health.
HS 3.2	Investigate paths that lead to careers in behavioral and mental health.
HS 3.3	Compare and contrast private and public settings in behavior and mental health counseling.
HS 4: Examine professional behaviors and essential skills necessary in human service careers.	
HS 4.1	Explore current ethical, legal, safety, and cultural guidelines in Human Services.
HS 4.2	Demonstrate essential skills needed in human service careers.
HS 4.3	Analyze the importance of professionalism in building trust and credibility.
HS 5: Explore personal attributes for careers in human services.	
HS 5.1	Identify personal attributes (values, skills, interests, and personality traits).
HS 5.2	Compare personal attributes to those needed for careers in human services.
HS 5.3	Assess how personal attributes, knowledge, and skills can be utilized to meet the needs of individuals, families, and communities.

Community Nutrition - 16054	
CN 1: Evaluate factors that influence nutrition decisions.	
CN 1.1	Investigate the impact of technology and media on food and health practices.
CN 1.2	Analyze the effects of psychological, cultural, economic, and social influences on food choices and other nutrition practices.
CN 2: Investigate food systems and their impact on community nutrition.	
CN 2.1	Explore personal and commercial food distribution systems.
CN 2.2	Describe food insecurity issues and their impact on the community.
CN 2.3	Identify food deserts and strategies to overcome them.
CN 2.4	Explore food programs that distribute commodities and resources to communities.
CN 3: Describe how preventative nutrition programs improve health and reduce health risks for individuals, families, and communities	
CN 3.1	Analyze programs that improve health and reduce the risk of diet-related diseases.
CN 3.2	Describe how community health and lifestyle programs prevent nutrition and health issues.
CN 4: Analyze community food and nutrition programs.	
CN 4.1	Examine social service programs that provide nutritional and food support to individuals, families, and communities.
CN 4.2	Research local food and nutrition programs and services.
CN 4.3	Explore the impact of school meals and nutrition programs on individuals, families, and communities.
CN 4.4	Investigate the impact of the Child and Adult Care Food Program (CACFP) on individuals, families, and communities.
CN 5: Explore sources of food for communities.	
CN 5.1	Explore local foods and locally grown initiatives.
CN 5.2	Analyze the role of culturally relevant food in community nutrition.
CN 5.3	Examine innovative methods for growing food.
CN 5.4	Research other methods for securing food. (e.g., foraging, gardening, hunting, fishing).
CN 5.5	Compare and contrast food sources.
CN 6: Analyze the role of community education and engagement in the lives of individuals, families, and communities.	
CN 6.1	Examine local community education and engagement programs related to food and nutrition.
CN 6.2	Compare and contrast forms of community nutrition education.

CN 6.3	Analyze community education priorities based on cultural needs.
CN 6.4	Describe the role of farmers' markets in community nutrition and food access.
CN 6.5	Examine resources provided by commodity organizations.
CN 6.6	Create a community-based nutrition program.
CN 7: Implement practices that promote industry-based safe food handling and food production.	
CN 7.1	Demonstrate an ability to follow food safety and sanitation procedures.
CN 7.2	Explore risks for foodborne illness and prevention strategies.
CN 7.3	Demonstrate techniques involved in food production, processing, distribution, consumption, and disposal of food.

Nutrition and Wellness - 19253	
NW 1: Evaluate factors that influence nutrition and wellness.	
NW 1.1	Determine the effects of nutrition and physical activity on health, appearance, and a healthy lifestyle.
NW 1.2	Analyze and investigate the impact of wellness dimensions on a healthy lifestyle.
NW 1.3	Critique the impact of food choices, trends, and fads on health and wellness.
NW 1.4	Evaluate the impact of disordered eating on health and wellness.
NW 2: Evaluate nutrients and their impact on health and wellness.	
NW 2.1	Identify the six essential nutrients and their functions.
NW 2.2	Describe nutrient requirements and deficiencies.
NW 2.3	Analyze nutrient requirements across the lifespan, addressing food customs and practices.
NW 3: Investigate nutrition guidelines, food plans, and dietary plans.	
NW 3.1	Identify current nutrition guidelines.
NW 3.2	Apply nutrition guidelines to your personal wellness.
NW 3.3	Examine dietary needs through the lifespan, including specialized diets.
NW 3.4	Adapt a recipe to meet a dietary need.
NW 4: Evaluate factors that affect kitchen and food safety.	
NW 4.1	Apply practices to promote safe food handling.
NW 4.2	Describe foodborne illnesses that cause health issues.
NW 4.3	Use kitchen tools and equipment in a proper and safe manner.
NW 5: Demonstrate that ability to acquire, handle, and utilize foods to meet the nutrition and wellness needs of individuals and families across the lifespan.	
NW 5.1	Plan and prepare a meal incorporating nutritional guidelines.
NW 5.2	Demonstrate ability to select, store, prepare, and serve nutritious and aesthetically pleasing foods.
NW 6: Analyze career paths within food science, food technology, dietetics, and nutrition industries.	
NW 6.1	Classify skills and educational requirements for employment in dietetics and nutrition fields.
NW 6.2	Differentiate the impact of societal and industry trends on food science, dietetics, and nutrition careers.

Relationships Across the Lifespan - 19255	
RL 1: Analyze functions and dynamics of interpersonal relationships across the lifespan.	
RL 1.1	Demonstrate communication skills that contribute to positive relationships.
RL 1.2	Identify effective conflict resolution and management strategies.
RL 1.3	Investigate the influence that internal and external stressors have on interpersonal relationships.
RL 1.4	Recognize your personality traits and their impact on relationships.
RL 2: Analyze factors that contribute to healthy relationships across the lifespan.	
RL 2.1	Connect interpersonal relationship strategies, techniques, and community resources to meet the needs of children and adolescents.
RL 2.2	Connect interpersonal relationship strategies, techniques, and community resources to meet the needs of adults.
RL 2.3	Connect interpersonal relationship strategies, techniques, and community resources to meet the needs of the elderly.
RL 3: Analyze dimensions of wellness that impact overall quality of life.	
RL 3.1	Identify the dimensions of wellness.
RL 3.2	Analyze and investigate the impact of wellness dimensions on a healthy lifestyle.
RL 3.3	Examine self-care practices and stress management to improve quality of life.
RL 3.4	Apply dimensions of wellness to behavioral and mental health careers.
RL 3.5	Examine how technology impacts wellness and quality of life.
RL 4: Evaluate the impact of relationships between family, work, and community responsibilities	
RL 4.1	Determine the skills necessary to thrive in family, community, and wage-earner roles.
RL 4.2	Demonstrate effective teamwork and leadership skills to build strong relationships and manage responsibilities.
RL 4.3	Investigate stress management techniques and strategies for balancing work and personal life.
RL 5: Recognize how interpersonal relationship skills can be applied to careers.	
RL 5.1	Research how healthy relationships impact career success.
RL 5.2	Examine how interpersonal relationship skills are applicable in all human services careers.

Human Development: Understanding Adulthood and Aging - 19261	
HDAA 1: Analyze principles of human growth and development through adulthood.	
HDAA 1.1	Compare human development theories related to adulthood.
HDAA 1.2	Evaluate how physical, emotional, social, and intellectual development are interconnected and influence well-being throughout adulthood and the aging process.
HDAA 2: Analyze influences on human growth and development.	
HDAA 2.1	Investigate the effect of heredity and environment on adulthood.
HDAA 2.2	Explain conditions influencing development (e.g., abuse, trauma, stress, social and technological forces).
HDAA 2.3	Investigate support systems for young adults through later life and the issues they address. (e.g., abuse, homelessness, food insecurity, financial assistance, elder care, memory care)
HDAA 2.4	Explain brain structure and development for this stage of life.
HDAA 3: Compare and contrast the stages of adulthood.	
HDAA 3.1	Apply human development theories and models to the stages of adulthood.
HDAA 3.2	Analyze physical, social, emotional, and intellectual development for early adulthood.
HDAA 3.3	Analyze physical, social, emotional, and intellectual development for middle adulthood.
HDAA 3.4	Analyze physical, social, emotional, and intellectual development for late adulthood.
HDAA 4: Analyze the processes of aging and end of life.	
HDAA 4.1	Identify the social and family dynamics that influence quality of life in aging populations (e.g., caregiving, independence, social isolation).
HDAA 4.2	Discuss coping strategies and support systems for individuals and families experiencing aging and end-of-life transitions.
HDAA 4.3	Describe common mental health challenges in older adulthood, such as depression, anxiety, grief, cognitive decline, dementia, Alzheimer's.
HDAA 4.4	Explore the process of grief and loss.
HDAA 4.5	Demonstrate understanding of legal and ethical factors related to aging and end of life.
HDAA 5: Describe how to manage opportunities and challenges throughout adulthood.	
HDAA 5.1	Identify changes in needs that occur throughout adulthood.
HDAA 5.2	Demonstrate understanding of legal, financial, and occupational opportunities and challenges throughout adulthood.
HDAA 5.3	Examine relationships throughout adulthood.
HDAA 6: Analyze the roles and responsibilities of caregivers throughout adulthood.	
HDAA 6.1	Discuss caregiving roles during different stages of adulthood.

HDAA 6.2	Analyze components of care and well-being for the stages of adulthood.
HDAA 6.3	Evaluate the impact of caregiving duties on the caregiver.
HDAA 6.4	Research support systems and community resources for caregivers.
HDAA 6.5	Compare and contrast caregiving options.
HDAA 7: Investigate careers related to helping people navigate through the stages of adulthood.	
HDAA 7.1	Summarize knowledge and skills for a career working with young adults through the aging population.
HDAA 7.2	Describe the skills needed to work effectively with individuals in the stages of adulthood.
HDAA 7.3	Evaluate how trauma, stress, or support systems can influence the ability to participate in the workforce.
HDAA 7.4	Research careers that help adults with life goals, workforce readiness, career transitions, and employment stability.

Family and Community Resources - 19264	
FCR 1: Investigate the role of individuals, families, and communities in their overall well-being and quality of life.	
FCR 1.1	Discuss the impact of your life and environment on overall health and well-being.
FCR 1.2	Explore theories that explain how individuals are impacted by their social connections and environment.
FCR 1.3	Explore ways to elevate the needs of individuals, families, and communities.
FCR 2: Analyze the effects of economic stability has on health, well-being, and quality of life.	
FCR 2.1	Examine rights and responsibilities of consumers.
FCR 2.2	Assess the factors that influence consumer relationships.
FCR 2.3	Apply financial management and planning skills to meet individual and family needs.
FCR 2.4	Explore support agencies that help provide economic stability to families.
FCR 3: Analyze the effects of education access and quality have on health, well-being, and quality of life.	
FCR 3.1	Recognize the importance of high-quality childcare.
FCR 3.2	Explore rights, responsibilities, and resources for access to education and care.
FCR 3.3	Explore support agencies that help provide access to high-quality education and childcare.
FCR 4: Analyze the effects of healthcare access and quality have on health, well-being, and quality of life.	
FCR 4.1	Research how access to healthcare affects overall health and well-being.
FCR 4.2	Examine support agencies that help connect citizens to high-quality health and nutrition services.
FCR 5: Analyze the effects of a neighborhood's infrastructure has on health, well-being, and quality of life.	
FCR 5.1	Explore issues related to affordable, safe, sustainable, and healthy environments.
FCR 5.2	Demonstrate effective management of individual and family resources such as recreation and housing.
FCR 6: Analyze the effects of social and community relationships have on health, well-being, and quality of life.	
FCR 6.1	Examine how community resources support the dimensions of wellness for healthy individuals, families, and communities.
FCR 6.2	Analyze the impact of trauma on individual, family, and community stability and well-being.
FCR 6.3	Explore how communities can support positive social interactions where people are born, live, learn, work, play, connect, and age.
FCR 6.4	Demonstrate management of resources to support individual, family, and community needs.

Cross Cluster Standards also connected with the Human Services Cluster	
Primary Cluster	**Course**
Education	Human Development: Preschool to School Age - 19051
Education	Human Development: Prenatal to Toddler – 19052
Education	Introduction to Education and Training - 19151
Education	SD Educators for Tomorrow - 19152
Hospitality, Events, & Tourism	Introduction to Food Concepts – 16052
Health Science	Introduction to Behavioral and Mental Health – 19301
Finance	Personal Finance - 19262

SEQUENCE OF COURSES

MANAGEMENT AND ENTREPRENEURSHIP

INVESTING IN THE FUTURE

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APPROVED CLUSTER COURSES

BUSINESS MARKETING AND MANAGEMENT CAREER PATHWAY

- 12104 Accounting I
- 12108 Accounting II
- 10005 Business Computer Applications
- 12051 Introduction to Business
- 12052 Business Management
- 12054 Business Law
- 12061 Entrepreneurial Skills
- 12105 Business Economics

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Cluster

Management and Entrepreneurship

The Management & Entrepreneurship Career Cluster focuses on developing the leadership, analytical, and organizational skills needed for careers in business. It prepares learners to manage people, projects, and processes. Careers in this area include roles in operations, project coordination, workforce management, and business development. By also emphasizing entrepreneurial thinking, this cluster cultivates future business leadership skills and entrepreneurial spirit in youth, empowering them to shape the future of business.

Introduction to Business - 12051	
IB 1: Identify skills needed to be successful in the global economic environment.	
IB 1.1	Explain key economic concepts such as scarcity, supply and demand, economic resources, indicators, systems, and global trade, and how they influence business decisions and economic activity.
IB 1.2	Identify the impact of globalization on business operations and economic systems.
IB 1.3	Explain the structure of the securities market.
IB 1.4	Describe the role of the Federal Reserve and how interest rates affect the economy.
IB 2: Compare the different forms of business organizations.	
IB 2.1	Compare and contrast different forms of business organizations.
IB 2.2	Identify characteristics of sole proprietorships, partnerships, corporations, cooperatives, nonprofits, and LLCs.
IB 2.3	Explain the advantages and disadvantages of each type of business organization.
IB 3: Explore how marketing, finance, human resources, technology, and management are used in business operations.	
IB 3.1	Identify the accounting elements comprising a financial statement and how they are used to describe a business operation.
IB 3.2	Describe the tools used to evaluate a business's current financial condition and develop financial plans.
IB 3.3	Explain the financial processes needed to start and operate a business.
IB 3.4	Summarize the human resource procedures and principles utilized in operating a business.
IB 3.5	Compare and contrast the factors in various management styles.
IB 4: Evaluate the financial management concepts involved in operating a business.	

IB 4.1	Identify the accounting elements comprising a financial statement and how they are used to describe a business operation.
IB 4.2	Describe the tools used to evaluate a business's current financial condition and develop financial plans.
IB 4.3	Identify banking services, including credit, loans, savings, and investment options available to manage business operations.
IB 5: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in business disciplines.	
IB 5.1	Investigate a variety of careers in business, management, marketing, finance, and entrepreneurship, including required skills, education, and typical career paths.
IB 5.2	Explore the various career paths that exist within the business industry.
IB 5.3	Evaluate the traits, mindsets, and behaviors common among successful business professionals/entrepreneurs, and assess how these can be developed.
IB 5.4	Analyze how ethical behavior impacts personal and professional success in business.

Business Computer Applications - 10005	
BCA 1: Manage an email system using a variety of features.	
BCA 1.1	Understand how email is used in a business and the importance of keeping email information safe and secure.
BCA 1.2	Create and manage a contact list.
BCA 1.3	Manage the calendar function within the email system.
BCA 2: Implement file management using a variety of methods.	
BCA 2.1	Compare and contrast options available in file management.
BCA 2.2	Utilize collaboration in file management.
BCA 3: Produce word processing documents using a variety of features.	
BCA 3.1	Create and manage documents, templates, options, and settings.
BCA 3.2	Format documents using basic and advanced editing.
BCA 3.3	Create tables and lists.
BCA 3.4	Create and manage basic and advanced references.
BCA 3.5	Insert, create, and format graphic elements.
BCA 3.6	Create custom word elements.
BCA 4: Produce spreadsheets using a variety of basic and advanced features.	
BCA 4.1	Create and manage worksheets and workbooks.
BCA 4.2	Manage data cells and named ranges.
BCA 4.3	Create and manage tables.
BCA 4.4	Create and perform logical operations with formulas and functions.
BCA 4.5	Create and modify charts and objects.
BCA 4.6	Prepare workbooks for collaboration.
BCA 5: Produce professional presentations using a variety of features.	
BCA 5.1	Create, configure, and modify presentations.
BCA 5.2	Collaborate and merge content from multiple presentations into one presentation.
BCA 5.3	Insert and format text, shapes and images.
BCA 5.4	Insert tables, charts, graphical elements, and media.

BCA 5.5	Apply transitions and animations.
BCA 6: Produce databases using a variety of features.	
BCA 6.1	Create and manage a database.
BCA 6.2	Create, build, and manage tables.
BCA 6.3	Create queries incorporating calculated fields and groupings.
BCA 6.4	Design and configure forms.
BCA 6.5	Create and configure reports to improve layout readability.
BCA 6.6	Explore and evaluate how database systems are used in real world applications across various industries.
BCA 7: Configure print settings and produce professional outputs across various applications.	
BCA 7.1	Select and adjust appropriate print settings (e.g. orientation, paper size, margins, color, duplexing, page range) based on the intended purpose of a document.
BCA 7.2	Preview and evaluate documents before printing.
BCA 8: Collaborate Effectively using cloud-based productivity tools	
BCA 8.1	Create, organize, and manage files using cloud based storage platform
BCA 8.2	Share files and folders will appropriate permissions
BCA 8.3	Collaborate on editing documents with others
BCA 8.4	Track revisions, comments, and version history to manage collaborative work.
BCA 9: Explore how computer application skills and industry certifications can support future career opportunities.	
BCA 9.1	Investigate employment opportunities that leverage computer application expertise.
BCA 9.2	Compare and contrast the value of industry certifications on employment in related industries.

Business Management - 12052	
BMGT 1: Define management and its role in effective and efficient business organizations.	
BMGT 1.1	Describe the importance of management and management functions to the success of business operations.
BMGT 1.2	Analyze the characteristics, behaviors, and decision-making styles of successful managers across various business environments.
BMGT 1.3	Identify challenges that managers face in business organizations and propose what they can do to overcome these challenges.
BMGT 2: Determine how functions of management are implemented and why they are important.	
BMGT 2.1	Investigate the planning and decision-making functions of management.
BMGT 2.2	Interpret the organizing function of management.
BMGT 2.3	Investigate the leading function of management.
BMGT 2.4	Summarize the controlling functions of management.
BMGT 3: Evaluate the importance of human resources in the success of a business operation.	
BMGT 3.1	Analyze human resource management methods in a business organization.
BMGT 3.2	Practice communication strategies creating a cohesive workforce.
BMGT 4: Analyze the impacts of international and government regulations on management decisions.	
BMGT 4.1	Investigate the legal environment of managing a business organization.
BMGT 4.2	Investigate the economic and international environment of managing a business organization.
BMGT 5: Students will utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in business disciplines.	
BMGT 5.1	Investigate a variety of careers in business management including required skills, education, and typical career paths.

Business Law - 12054	
BL 1: Students will analyze relationships between business ethics and classifications of business law.	
BL 1.1	Compare and contrast differences between business ethics, business laws, and identify consequences of unethical and illegal conduct.
BL 1.2	Analyze the origin of today's law and functions of local, state and federal court systems.
BL 1.3	Differentiate between procedural and substantive laws.
BL 1.4	Describe dispute resolution techniques.
BL 2: Students will demonstrate an understanding of characteristics of criminal and tort laws.	
BL 2.1	Differentiate among categories of criminal law, different types of business crimes, and available penalties.
BL 2.2	Differentiate among categories of tort law and describe remedies available.
BL 3: Students will evaluate factors in contract law.	
BL 3.1	Demonstrate an understanding of contractual relationships and identify elements of a valid contract.
BL 3.2	Understand and defend methods by which a contract may be terminated or discharged.
BL 4: Students will analyze the role and importance of employment law, sales law, and consumer law as it relates to the conduct of business organizations.	
BL 4.1	Demonstrate an understanding of employer-employee relationships, including independent contractors.
BL 4.2	Identify employee rights and their implications in workplace settings.
BL 4.3	Compare and contrast laws of sales and consumer laws.
BL 4.4	Analyze a real or fictional case and present a legal argument using facts and applicable law.
BL 5: Students will analyze legal and ethical issues related to technology and digital business practices.	
BL 5.1	Describe the legal responsibilities of businesses regarding data protection, cybersecurity, and consumer privacy.
BL 5.2	Analyze the legal implications of e-commerce, digital contracts, clickwrap agreements, and terms of service.
BL 5.3	Examine laws and regulations related to intellectual property and copyright in the digital age.
BL 6: Students will utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in law.	
BL 6.1	Explore the education, training, and certifications required for various careers in the legal field.

Entrepreneurial Skills - 12061	
ES 1: Understand the Entrepreneurial Mindset: the traits, thinking patterns, and behaviors of successful entrepreneurs.	
ES 1.1	Describe key characteristics of entrepreneurs (e.g., creativity, risk-taking, resilience).
ES 1.2	Explain how an entrepreneurial mindset supports innovation and problem-solving.
ES 1.3	Reflect on personal strengths and interests and how they relate to entrepreneurship.
ES 1.4	Evaluate the relationship between risk and reward in business decision-making, including how entrepreneurs manage uncertainty to achieve success
ES 1.5	Connect with influential entrepreneurs in your community and learn what motivated them to start a business
ES 2: Explore business ideas and opportunities.	
ES 2.1	Brainstorm business ideas based on customer needs or everyday problems.
ES 2.2	Identify potential target markets and gaps in existing products or services.
ES 2.3	Evaluate advantages and disadvantages of business locations.
ES 2.4	Analyze the feasibility of a business idea using simple criteria (cost, time, demand).
ES 2.5	Assess barriers to a startup.
ES 3: Demonstrate an understanding of the elements and purpose of business and strategic planning in entrepreneurship.	
ES 3.1	Identify and explain the components of a business plan.
ES 3.2	Conduct market research using a variety of methods. Compare and contrast strategic goals, long-range planning, and operational business plans.
ES 3.3	Compare and contrast sample business plans, identifying strengths and weaknesses.
ES 3.4	Develop a simple business plan outline for a student-generated business idea and synthesize all elements into a business plan.
ES 3.5	Evaluate the relationship between risk and reward in business decision-making, including how entrepreneurs manage uncertainty to achieve success.
ES 4: Recognize the role of money in business.	
ES 4.1	Identify common startup costs for a new business.
ES 4.2	Explain the difference between revenue, expenses, profit, and loss.
ES 4.3	Research sources of capital.
ES 4.4	Formulate pricing strategies for goods and services.
ES 4.5	Project annual and monthly business income and expenses.

ES 4.6	Calculate projected sales, income, expenses, taxes, and break-even point.
ES 4.7	Construct a financial plan.
ES 5: Understand effective marketing.	
ES 5.1	Identify target markets, competition, and customer profiles.
ES 5.2	Explain the components of a promotional plan (i.e., advertising, public relations, sales promotion) and how the plan is used to achieve a stated outcome.
ES 5.3	Define the four P's of marketing (product, price, place, promotion).
ES 5.4	Conduct market research to develop strategies for marketing products or services.
ES 5.5	Create an effective marketing plan including current social media, digital marketing, and other technologies.
ES 6: Understand the role of human resources.	
ES 6.1	Research job descriptions, compensation, and benefits for potential employees.
ES 6.2	Identify government regulations (federal, state, and local) that affect small business.
ES 6.3	Recognize various types of taxes that affect small business.
ES 6.4	Understand policies and laws regarding harassment, nondiscrimination, and workplace safety.
ES 7: Explore entrepreneurship as a potential career path	
ES 7.1	Compare self-employment versus traditional employment.
ES 7.2	Assess personal interests, strengths, and characteristics to determine how they align with entrepreneurial careers.

Cross Cluster Standards also connected with the Management and Entrepreneurship Cluster	
Primary Cluster	**Course**
Finance	Principals of Banking - 12102
Finance	Accounting I -12104
Finance	Accounting II - 12108
Finance	Principles of Insurance -12106
Finance	Investment Planning -12107
AP (Advanced Placement) course standards are set by College Board	

SEQUENCE OF COURSES

MARKETING AND SALES

INVESTING IN THE FUTURE



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APPROVED CLUSTER COURSES

MARKETING AND ADVERTISING PATHWAY

- 12051 Introduction to Business
- 10005 Business Computer Applications
- 12164 Modern Marketing
- 12202 Sales and Customer Relations
- 12152 Advertising, Promotion, Branding, & Design
- 12163 Sports and Entertainment Marketing
- 12061 Entrepreneurial Skills

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Marketing and Sales Cluster

The Marketing and Sales Career Cluster focuses on promoting products, understanding consumer needs, engaging with communities, and driving sales. It integrates digital marketing, data analysis, brand promotion, customer relationship management, strategic communications, human-centered design, and retail strategies to build strong customer connections and support business growth.

Modern Marketing - 12164	
MM 1: Understand the fundamental concepts of modern marketing.	
MM 1.1	Explain the principles of marketing, the marketing process, and the role of stakeholders.
MM 1.2	Define the marketing philosophy.
MM 1.3	Explain the different marketing functions within an organization.
MM 1.4	Discuss the impacts of ethical and unethical marketing.
MM 1.5	Explain the importance of marketing in a global economy.
MM 2: Identify the roles of product, price, place, and promotion in modern marketing.	
MM 2.1	Explain product planning and development.
MM 2.2	Distinguish factors involved in price planning.
MM 2.3	Explain place (channels of distribution).
MM 2.4	Explain promotional mix and its concepts and strategies.
MM 3: Understand the concepts of markets and market segmentation.	
MM 3.1	Define target market and terms related to the concepts of target marketing.
MM 3.2	Explain market segmentation.
MM 3.3	Identify potential target markets for various products and services.
MM 3.4	Explain how market segmentation is evolving and expanding.
MM 4: Understand the concept of marketing research and how it relates to marketing.	
MM 4.1	Define marketing research, its purpose, benefits, and importance.
MM 4.2	Explain the marketing research process.
MM 4.3	Compare various types of research data including primary to secondary and quantitative to qualitative.
MM 5: Explain the importance and function of a marketing plan.	
MM 5.1	Identify the components of a marketing plan.

MM 5.2	Identify marketing goals, objectives, and strategies.
MM 5.3	Explain the process and purpose of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis.
MM 5.4	Utilize marketing research to create a marketing plan.
MM 6: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in marketing and sales.	
MM 6.1	Investigate a variety of careers in marketing and sales including required skills, education, and typical career paths.

Sales and Customer Relations -12202	
SCR 1: Understand the role of sales.	
SCR 1.1	Identify the promotional mix.
SCR 1.2	Describe the role of sales in the promotional mix.
SCR 1.3	Compare and contrast relationship selling and transactional selling.
SCR 2: Examine the unique challenges of ethical decision-making in sales.	
SCR 2.1	Describe various methods of ethical decision-making.
SCR 2.2	Examine the legal and ethical dilemmas unique to sales.
SCR 2.3	Evaluate personal and professional ethical responsibilities in sales.
SCR 2.4	Explain long-term personal and workplace consequences of unethical or illegal behaviors.
SCR 3: Differentiate between consumer and business buying behavior.	
SCR 3.1	Differentiate between consumer needs and consumer wants.
SCR 3.2	Describe the consumer decision-making process.
SCR 3.3	Compare and contrast business-to-consumer sales and business-to-business sales.
SCR 3.4	Summarize unique aspects of business buying behavior.
SCR 4: Demonstrate the sales process.	
SCR 4.1	Describe the steps in the sales process.
SCR 4.2	Explain lead generation and lead qualification.
SCR 4.3	Utilize the needs assessment process.
SCR 4.4	Demonstrate the components of a sales presentation.
SCR 4.5	Explain strategies to identify and handle customer concerns and objections.
SCR 4.6	Describe when and how to close a sale.
SCR 4.7	Determine the importance of follow-up within the sales process.
SCR 5: Identify the importance of customer relationship management (CRM).	
SCR 5.1	Explain the customer relationship management concept.
SCR 5.2	Explore available CRM technologies.
SCR 5.3	Demonstrate customer de-escalation techniques.
SCR 6: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in sales and customer relations.	
SCR 6.1	Investigate a variety of careers in sales and customer relations, including required skills, education, and typical career paths.

Advertising, Promotion, Branding, and Design -12152	
APBD 1: Investigate the advertising industry.	
APBD 1.1	Explain the role of advertising and promotion within the marketing mix.
APBD 1.2	Explain the role of branding and design.
APBD 1.3	Explore the evolution of advertising.
APBD 2: Describe the role of advertising in marketing and sales.	
APBD 2.1	Identify the components of effective advertising.
APBD 2.2	Develop persuasive advertising messages.
APBD 2.3	Evaluate the effectiveness of advertising.
APBD 2.4	Investigate the impact of social media advertising.
APBD 2.5	Explain ethical practices and regulations in advertising.
APBD 2.6	Differentiate between traditional, digital, and social media advertising platforms, highlighting their distinct features and benefits.
APBD 3: Explain the role of promotion in marketing and sales.	
APBD 3.1	Explain the tools and strategies of the promotional mix.
APBD 3.2	Differentiate between types of promotional strategies.
APBD 3.3	Identify trends and emerging patterns in promotions.
APBD 3.4	Create a promotional campaign.
APBD 4: Describe the concepts and strategies used in branding.	
APBD 4.1	Define branding concepts.
APBD 4.2	Describe the guidelines for brand standards (e.g., font, color, look, layout, slogan, logo).
APBD 4.3	Evaluate diverse brand strategies across contemporary media and channel contexts.
APBD 4.4	Explain the relationship between branding and consumer perception.
APBD 4.5	Describe legal and social considerations in branding.
APBD 4.6	Develop a brand strategy.
APBD 5: Apply design concepts in advertising, promotion, and branding.	
APBD 5.1	Explain the elements and principles of design in marketing and sales contexts.
APBD 5.2	Describe the role of design in advertising, promotion, and branding.
APBD 5.3	Implement design tools used in advertising.
APBD 5.4	Utilize design principles to create elements of a brand.
APBD 6: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in advertising, promotion, branding, and design.	
APBD 6.1	Investigate a variety of careers in advertising, promotion, branding, and design, including required skills, education, and typical career paths.

Sports and Entertainment Marketing – 12163	
SEM 1: Summarize the significance of the sports and entertainment industry.	
SEM 1.1	Validate the sports and entertainment industry as a valuable segment of the economy.
SEM 1.2	Investigate the history of sports and entertainment as a factor in economic growth and marketing.
SEM 1.3	Explore industries related to sports and entertainment events.
SEM 1.4	Identify stakeholders in the sports and entertainment industry.
SEM 2: Explain the organizational structure within the sports and entertainment industry.	
SEM 2.1	Distinguish between the different types of organizational structures such as sport governing bodies, sport providing entities, and sport spectacle organizations (e.g. NBA, PGA, entertainment group) within the sports and entertainment industry.
SEM 2.2	Explain the advantages and disadvantages of operating a sports and entertainment entity as a for-profit or not-for-profit organization.
SEM 2.3	Explain how revenues and expenses impact profitability.
SEM 2.4	Compare the differences in the goals of different levels of events and the relative benefits to the community (e.g. a national football team and a youth baseball team).
SEM 3: Explore target markets and market segmentation in the sports and entertainment industry.	
SEM 3.1	Develop a market segmentation analysis.
SEM 3.2	Identify niche markets in the sports and entertainment industry.
SEM 3.3	Explore the impact of geographical segmentation on the sports and entertainment industry.
SEM 3.4	Compare and contrast sports and entertainment clientele and fan base.
SEM 4: Examine marketing management in the sports and entertainment industry.	
SEM 4.1	Explain how market analysis is applied in the sports and entertainment industry.
SEM 4.2	Explain how marketing management is an important tool in developing marketing strategies.
SEM 4.3	Describe external factors and how they affect the sports and entertainment industry.
SEM 5: Examine the unique marketing mix in the sports and entertainment industry.	
SEM 5.1	Describe the product, price, place, and promotion components of a marketing mix.
SEM 5.2	Interpret the importance of product planning in sports and entertainment.
SEM 5.3	Compare ticket sales and other pricing policies in the sports and entertainment industry.

SEM 5.4	Examine considerations involved in facility design.
SEM 5.5	Examine promotional concepts in the sports and entertainment industry.
SEM 5.6	Examine the role and impact of sponsorships in the sports and entertainment industry.
SEM 6: Discuss the importance of ethics and analyze the legal aspects of the sports and entertainment industry.	
SEM 6.1	Discuss ethical issues that may arise in the sports and entertainment industry.
SEM 6.2	Explain risk management and its relationship to the sports and entertainment industry.
SEM 6.3	Examine the impact of personal branding on the sports and entertainment industry. Including name, image, and likeness (NIL)
SEM 6.4	Identify purposes, types, and terms of contracts including copyrights, trademarks, and licensing.
SEM 6.5	Explain the impact of the Americans with Disabilities Act (ADA) on sports and entertainment events and facilities.
SEM 7: Utilize career-planning concepts, tools, and strategies to explore, obtain, and/or develop a career in sports and entertainment marketing.	
SEM 7.1	Investigate a variety of careers in sports and entertainment marketing including, required skills, education, and typical career paths.

Cross Cluster Standards also connected with the Marketing and Sales Cluster	
Primary Cluster	**Course**
Management and Entrepreneurship	Business Computer Applications - 10005
Management and Entrepreneurship	Advanced Business Computer Applications- 10049
Management and Entrepreneurship	Introduction to Business - 12051
Management and Entrepreneurship	Entrepreneurial Skills - 12061

SEQUENCE OF COURSES

PUBLIC SERVICE AND SAFETY

CARING FOR COMMUNITIES



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APPROVED CLUSTER COURSES

PUBLIC SERVICE AND SAFETY CLUSTER

- 14055 Introduction to Emergency Medical Services
- 15001 Introduction to Law and Public Safety I
- 15054 Introduction to Law and Public Safety 2
- 15151 Introduction to Fire Science
- 15201 Government, Leadership, and Public Service

J-ROTC

- 9001 Introduction to Jr. ROTC
- 9002 Military Jr. ROTC—unspecified branch
- 9003 ROTC Drill
- 9004 Military Leadership
- 9051 Army Junior ROTC I
- 9052 Army Junior ROTC II
- 9053 Army Junior ROTC III
- 9054 Army Junior ROTC IV

J-ROTC (CONTINUED)

- 9101 Naval Junior ROTC I
- 9102 Naval Junior ROTC II
- 9103 Naval Junior ROTC III
- 9104 Naval Junior ROTC IV
- 9151 Air Force Junior ROTC I
- 9152 Air Force Junior ROTC II
- 9153 Air Force Junior ROTC III
- 9154 Air Force Junior ROTC IV
- 9201 Marine Corps Junior ROTC I
- 9202 Marine Corps Junior ROTC II
- 9203 Marine Corps Junior ROTC III
- 9204 Marine Corps Junior ROTC IV

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

MIDDLE SCHOOL COURSES

- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

Career Cluster

Public Service and Safety

The Public Service & Safety Career Cluster encompasses roles in local, state, and federal government; legal and justice systems; public safety; and military operations, all aimed at promoting civic responsibility and ensuring the well-being, security, functionality, and resilience of communities, states, and countries.

Introduction to Law and Public Safety I - 15001	
LPS-I 1: Identify career opportunities and qualifications needed in law and public safety fields.	
LPS-I 1.1	Explore career paths and qualifications needed for people within paralegal and legal fields.
LPS-I 1.2	Explore career paths, qualifications, and physical requirements in law enforcement.
LPS-I 1.3	Explore career paths, qualifications, and physical requirements in corrections.
LPS-I 1.4	Explore career paths and qualifications in security and protective services.
LPS-I 1.5	Explore career paths, qualifications, and physical requirements in fire management and Emergency Medical Services (EMS).
LPS-I 1.6	Explore career paths, qualifications, and physical requirements in conservation.
LPS-I 1.7	Identify career advancement potential for each of the career paths.
LPS-I 1.8	Summarize the pre-requisites to enter various fields of law and public safety careers.
LPS-I 2: Analyze the impact of law and public safety work on individuals in the field.	
LPS-I 2.1	Identify and analyze factors that influence the mental health of someone working in the various fields of law and public safety.
LPS-I 2.2	Identify and describe wellness strategies for individuals working in the various fields of law and public safety.
LPS-I 2.3	Analyze how job demands impact lifestyle and choices.
LPS-I 3: Research societal issues that impact law and public safety careers.	
LPS-I 3.1	Research prominent deviant behaviors within society.
LPS-I 3.2	Research criminal behavior within society.
LPS-I 3.3	Analyze data (e.g. economic hardships, drug use, location, etc.) related to the trends in incidence of criminal behaviors.
LPS-I 4: Compare and contrast local, county, state, tribal, and federal governments.	
LPS-I 4.1	Explain the jurisdiction associated with each of the different layers of government.
LPS-I 4.2	Distinguish the constituent similarities and differences of each of the levels of government.
LPS-I 4.3	Identify the unique characteristics of tribal government.
LPS-I 4.4	Explain the role federalism plays in the division of power between governmental units.
LPS-I 5: Summarize how laws are made.	
LPS-I 5.1	Identify the steps of the legislative process in which laws or statutes evolve.
LPS-I 5.2	Compare the lawmaking processes of local, county, state, tribal, and federal governments.
LPS-I 6: Analyze the development, interpretation, and application of laws within the legal system.	

LPS-I 6.1	Demonstrate an understanding of the basis, purpose, and application of common law as it applies to case law and precedent.
LPS-I 6.2	Demonstrate an understanding of the basis, purpose, and application of constitutional law.
LPS-I 6.3	Demonstrate an understanding of the basis, purpose, and application of statutory law.
LPS-I 6.4	Evaluate and analyze criminal elements related to laws.
LPS-I 6.5	Demonstrate an understanding of the basis, purpose, and application of court decisions.
LPS-I 6.6	Demonstrate an understanding of the basis, purpose, and application of administrative law.
LPS-I 6.7	Research and analyze components and possible outcomes of criminal law.
LPS-I 6.8	Research and analyze components and possible outcomes of civil law.
LPS-I 7: Determine the criteria if a crime has been committed according to state or federal law.	
LPS-I 7.1	Examine crimes against people, property and society.
LPS-I 7.2	Differentiate between crimes classified as felonies or misdemeanors and the punishments for each.
LPS-I 7.3	Discuss the five basic premises of criminal law.
LPS-I 8: Examine the importance of communication and human relations skills in the law and public safety field.	
LPS-I 8.1	Identify that different settings require different types of behavior, communication styles and relationships.
LPS-I 8.2	Examine effective human relations skills that can be utilized for law and public safety careers.
LPS-I 8.3	Demonstrate effective modes of interpersonal communication with peers, colleagues, and the public in law and public safety settings.
LPS-I 9: Recognize the basics of technical writing for reports and for accurate and professional documentation in the law and public safety field.	
LPS-I 9.1	Evaluate why technical writing in the law and public safety field needs to be factual, non-biased, and without conclusion, as opposed to that exhibited in persuasive, personal narrative, critical analysis, and research.
LPS-I 9.2	Compare and contrast styles of writing.
LPS-I 9.3	Investigate how to write a case report.
LPS-I 9.4	Examine industry-specific criteria for technical writing in various law and public safety fields (e.g. legal notification, case reports, probation violations, pre-sentence investigations, legal briefs, search warrants, court orders, incident reports, etc.).

Introduction to Law and Public Safety II - 15054	
LPS-II 1: Analyze ethical decisions and their implications in law and public safety careers.	
LPS-II 1.1	Apply ethical reasoning and decision making to a variety of workplace situations in compliance with industry codes of conduct.
LPS-II 1.2	Investigate personal and long-term consequences of unethical or illegal behaviors.
LPS-II 2: Explore skills needed to work with a variety of people in law and public safety career fields.	
LPS-II 2.1	Identify factors that lead to different perspectives.
LPS-II 2.2	Practice strategies that promote professionalism and trust when interacting with different populations.
LPS-II 2.3	Explore how life experiences and community influences can affect interactions with law enforcement and public officials.
LPS-II 2.4	Recognize appropriate approaches working with people with differing cognitive, language, physical, and mental needs.
LPS-II 3: Apply appropriate skills in documentation.	
LPS-II 3.1	Describe the components of a police case report and how it is used as a legal document.
LPS-II 3.2	Describe techniques and tools used by police during criminal investigation.
LPS-II 3.3	Analyze different forms of legal correspondence.
LPS-II 3.4	Describe components needed in writing accurate and concise reports.
LPS-II 3.5	Examine technology's impact on documentation in law and public safety fields.
LPS-II 4: Explore the US Constitution, Bill of Rights and other amendments, and South Dakota laws which impact the law and public safety profession.	
LPS-II 4.1	Analyze the impact of the Bill of Rights and constitutional amendments as they pertain to law and public safety workplaces.
LPS-II 4.2	Summarize the concepts and procedures related to due process.
LPS-II 4.3	Analyze the impact of the judicial interpretation of the Constitution and its legal ramifications.
LPS-II 4.4	Explore relevant South Dakota codified laws related to law and public safety careers (e.g. Title 16 (courts and judiciary), Title 22 (crimes), Title 23 (Law Enforcement Topics), Title 24 (correctional facilities and parole), Title 25 (25-10 domestic abuse), Title 32 (motor vehicles), etc.).
LPS-II 5: Demonstrate skills in first aid, cardiopulmonary resuscitation (CPR) and automated external defibrillation (AED) to certification standards.	
LPS-II 5.1	Perform First Aid, CPR, and correct AED usage.
LPS-II 5.2	Demonstrate how to perform bleeding control utilizing concepts from Stop the Bleed. (wound packing, dressings, and tourniquet application)
LPS-II 6: Explore effective communication techniques for law and public safety careers.	
LPS-II 6.1	Determine appropriate communication techniques utilized in various law and public safety settings.
LPS-II 6.2	Define the term "active listening" and explain how it can be used effectively.
LPS-II 6.3	Practice coping strategies to manage emotions in the workplace.

LPS-II 6.4	Apply conflict and anger management strategies to de-escalate tense situations.
LPS-II 7: Explore current and emerging technology utilized in law and public safety careers.	
LPS-II 7.1	Explore the connection between technology and investigation (e.g., cellphone data, facial recognition, DNA, AI genealogy, license plate readers, predictive analysis, etc.).
LPS-II 7.2	Investigate evolution of equipment in law enforcement.
LPS-II 7.3	Discuss the Frye standard and reliability of evidence.
LPS-II 8: Determine the impact of cybercrimes on society.	
LPS-II 8.1	Analyze the impact of cybercrimes on law and public safety.
LPS-II 8.2	Describe the role of digital evidence in law and public safety.

Government, Leadership, and Public Service -15201	
GLPS 1: Investigate careers in the fields of government and public service.	
GLPS 1.1	Investigate career paths in public roles (e.g. administration, elected office, public safety, military, non-profits, tribal government, etc.).
GLPS 1.2	Compare and contrast careers that have both public and private employment opportunities.
GLPS 1.3	Create career profiles for occupations in different levels of government, including a job description and job requirements (education and experience levels, licensure/credentials, and skills and dispositions needed).
GLPS 2: Examine the structure, functions, and responsibilities of public organizations.	
GLPS 2.1	Compose a list of services typically provided by local, state, federal, and tribal governments.
GLPS 2.2	Analyze how public organizations respond to community needs.
GLPS 2.3	Explore the role of staff in local, state, tribal, and federal government agencies.
GLPS 2.4	Explain how public agencies collaborate to provide services.
GLPS 2.5	Explore the purpose of boards, commissions, and advisory councils.
GPLS 3: Examine the management and administration of public resources.	
GLPS 3.1	Define and differentiate between public goods and services and private goods and services.
GLPS 3.2	Investigate theories as to why the government or the private sector is better suited to provide specific goods or services.
GLPS 3.3	Determine cause and effect of privatization and/or nationalization of goods and services.
GLPS 4: Examine the process of policy making and implementation in government at local, state, tribal, and national levels.	
GLPS 4.1	Compare and contrast the rights and duties of citizens at the local, state, and national levels.
GLPS 4.2	Identify components of the regulation and statute-making process.
GLPS 4.3	Explore public disclosure and open meeting laws and how the public is able to stay informed.
GLPS 5: Evaluate public meetings and governmental decision-making processes.	
GLPS 5.1	Observe live or recorded public meetings, hearings, or legislative sessions.
GLPS 5.2	Analyze the roles and responsibilities of the meeting participants.
GLPS 5.3	Evaluate how decisions are discussed, debated, and finalized.
GLPS 5.4	Reflect on the effectiveness of the process and procedures.
GLPS 6: Analyze the role of nonprofit organizations in meeting public needs.	
GLPS 6.1	Explore the purpose of nonprofit organizations.
GLPA 6.2	Examine how nonprofit organizations collaborate with government, businesses, and community partners.

Introduction to Fire Science - 15151	
IFS 1: Analyze Fire Service occupations and responsibilities.	
IFS 1.1	Explore the history, organization, and structure of fire departments.
IFS 1.2	Understand the roles and responsibilities of firefighters within the community.
IFS 1.3	Identify ethical considerations and professional conduct expected of firefighters.
IFS 1.4	Explore the importance of community engagement and public relations.
IFS 2: Identify firefighter safety and wellness protocols.	
IFS 2.1	Learn about personal protective equipment (PPE) and safety protocols.
IFS 2.2	Understand the importance of physical fitness, mental wellness, and nutrition in the firefighting profession.
IFS 3: Examine fire behavior and ways to prevent fire.	
IFS 3.1	Study the science of fire, including its behavior, stages, and characteristics.
IFS 3.2	Examine wildland fire behaviors, stages, and characteristics.
IFS 3.3	Explore fire prevention strategies and public education initiatives.
IFS 4: Describe fire equipment and tools.	
IFS 4.1	Identify various tools and equipment used by firefighters.
IFS 4.2	Discuss equipment and tools used in wildfire suppression.
IFS 4.3	Describe apparatus differences.
IFS 4.4	Determine proper use and maintenance of firefighting gear.
IFS 5: Explore techniques used for basic fire suppression.	
IFS 5.1	Introduce basic firefighting techniques, including hose handling, nozzle operation, and fire extinguishment methods.
IFS 5.2	Recognize fire attack strategies.
IFS 5.3	Describe wildfire suppression techniques.
IFS 6: Determine the role of a firefighter in providing initial emergency medical response.	
IFS 6.1	Learn basic first aid and emergency medical response techniques relevant to firefighting.
IFS 6.2	Recognize the importance of providing initial medical assistance at emergency scenes.
IFS 7: Analyze the process by which emergency personnel exert command and control.	
IFS 7.1	Describe the principles and responsibilities of the Incident Command System (ICS).
IFS 7.2	Explore multiagency coordination and unified command.
IFS 7.3	Discuss the importance of an organized command and control system.

Cross Cluster Standards also connected with the Public Service and Safety Cluster	
Primary Cluster	**Course**
Health Science	Introduction to Emergency Medical Services

Junior Reserve Officer Training Corps
Curricular Materials and Standards for JROTC Courses are provided by each military branch.

SEQUENCE OF COURSES

SUPPLY CHAIN AND TRANSPORTATION

BUILDING AND MOVING



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APPROVED CLUSTER COURSES

AVIATION PATHWAY

- 21051 Introduction to Technology Skills and Application
- 20053 Aviation Careers I
- 20056 Aviation and Drone Fundamentals
- 20057 Aviation Careers II
- 20058 Aviation Maintenance
- 20119 Emerging Transportation Technology

AUTOMOTIVE MAINTENCE AND REPAIR PATHWAY

- 21051 Introduction to Technology Skills and Application
- 20106 Introduction to Vehicle Systems and Maintenance
- 20104 Maintenance & Light and Basic Repair
- 20105 Electrical/Electronic Systems and HVAC
- 20999 Introduction to CDL Theory
- 20107 Diesel Technology
- 20110 Small Engine Mechanics
- 20119 Emerging Transportation Technology
- 20121 Automotive Engine Repair & Performance
- 20122 Brakes, Drivetrain , and Axles
- 20123 Transmission, Suspension, and Steering
- 20111 Powersports
- 20124 Introduction to Auto Body Estimating
- 20115 Non-Structural Analysis & Damage Repair
- 20116 Auto Body Painting and Refinishing
- 20117 Structural Analysis & Damage Repair

CTE CONCENTRATORS

Complete any two approved cluster courses while in high school. Students may be concentrators in multiple clusters.

ADVANCED CAREER ENDORSEMENT

- Two credits of approved cluster courses from the same cluster including foundational, capstone, and/or approved cluster specific dual credit.
- Earn an Industry Recognized Credential.
- Complete other Graduation Requirements.

MIDDLE SCHOOL COURSES

- 21050 Exploring STEM in CTE
- 22100 Middle School Exploring CTE

FOUNDATIONAL COURSES

- 22151 Career Exploration
- 22152 Employability
- 10004 Workplace Technology
- 22101 Leadership & Service
- 19262 Personal Finance

CAPSTONE/WORK-BASED LEARNING

- 22104 Service Learning Experience
- 80018 Youth Internship Experience
- 80019 Senior Experience
- 80020 Youth Apprenticeship Experience
- 80026 Entrepreneurship Experience

INDUSTRY RECOGNIZED CREDENTIALS

Visit doe.sd.gov/cte/industry.aspx for a full list of industry recognized credentials in this career cluster.

DUAL CREDIT COURSES

Visit the resources section on the ourdakotadreams.com dual credit page.

POST-SECONDARY OPTIONS

Visit sdmylife.com for more information about potential careers in this area and explore colleges and majors to further your education.

Career Cluster

Supply Chain and Transportation

The Supply Chain & Transportation Career Cluster encompasses the transfer, coordination, and management of goods from production to consumption, ensuring efficient movement across various modes of transportation including air, ground, and water, as well as maintenance and repair of those transportation systems.

Introduction to Vehicle Systems & Maintenance - 20106	
IVSM 1: Demonstrate automotive technology safety practices for an automotive repair facility.	
IVSM 1.1	Demonstrate automotive technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
IVSM 1.2	Demonstrate an understanding of Environmental Protection Agency (EPA) regulations on waste gases, emissions, and other environmentally hazardous substances.
IVSM 1.3	Demonstrate the safe and proper use of hand and power tools.
IVSM 2: Demonstrate the safe and appropriate use of tools, equipment and work processes.	
IVSM 2.1	Use the appropriate tools and equipment while working in the shop or jobsite.
IVSM 2.2	Use a digital multimeter.
IVSM 2.3	Demonstrate use of a load tester.
IVSM 2.4	Select and demonstrate proper use of measuring instruments (micrometer, caliper) and mathematical formulas (Ohm's Law, cubic displacement, horsepower).
IVSM 2.5	Use standard and metric units of measurement.
IVSM 2.6	Convert standard units and metric units.
IVSM 2.7	Use measurement devices to diagnose and repair vehicles and components following industry standards.
IVSM 2.8	Navigate Technical Service Bulletins (TSBs) and service manuals.
IVSM 2.9	Comprehend the importance of calibration processes, systems, and techniques using various measuring and testing devices. ● Calibrate a dial indicator ● Check the accuracy of an outside/inside micrometer ● Calibrate an Ohmmeter
IVSM 3: Apply scientific principles in relation to chemical, mechanical, and physical functions of vehicle power plants (engines) and systems.	
IVSM 3.1	Explain the operation of the internal combustion engine.

IVSM 3.2	Explain the operating principles of heating and air conditioning systems.
IVSM 3.3	Compare alternate fuel and power sources (e.g., hybrid, fuel cell, and electric vehicles).
IVSM 4: Explain, perform, and document maintenance procedures and repairs according to manufacturers' specifications.	
IVSM 4.1	Utilize service information to find vehicle specifications.
IVSM 4.2	Demonstrate the procedures and practices for manufacturers' repair and maintenance schedules. ● Change oil and filter according to manufacturer's specs ● Check proper inflation and condition of vehicle tires ● Check and refill critical fluids ● Inspect belts and hoses
IVSM 4.3	Demonstrate tire maintenance and care (tire rotation, tread depth, air pressure, and tire wear types).
IVSM 5: Understand and apply appropriate vehicle service and repairs.	
IVSM 5.1	Perform general automotive diagnosis and repair in a professional manner within Automotive Service Excellence (ASE). ● Perform engine compression test (dry/wet) ● Set gap and replace spark plugs and wires as needed
IVSM 5.2	Explain the process to maintain and service lubrication and cooling systems.
IVSM 5.3	Diagnose computer system failure using a code reader or scanner.
IVSM 6: Utilize the function, principles and operation of electrical systems using manufacturers' and industry standards.	
IVSM 6.1	Demonstrate use of a digital volt ohm meter (DVOM) to read volts, ohms, and amps.
IVSM 6.2	Diagnose and service batteries.
IVSM 6.3	Explain how to diagnose and repair starting and charging systems.
IVSM 6.4	Explain how to properly diagnose and repair lighting systems.
IVSM 7: Utilize the function and principles of automotive brake, steering and suspension, automatic and manual transmission systems.	
IVSM 7.1	Explain how to inspect brake systems.
IVSM 7.2	Explain how to inspect steering and suspension systems.
IVSM 7.3	Explain how to inspect automatic and manual transmissions.

IVSM 8: Understand and apply appropriate business practices.	
IVSM 8.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
IVSM 8.2	Apply ethical business practices.
IVSM 8.3	Apply excellent customer relations practices.
IVSM 9: Explore the careers in the automotive industry.	
IVSM 9.1	Investigate automotive maintenance related career fields and occupations.
IVSM 9.2	Compare education and training options available for careers in automotive maintenance (e.g., apprenticeships, technical colleges).

Maintenance and Basic Repair - 20104	
MBR 1: Demonstrate safety practices for automotive repair.	
MBR 1.1	Identify and demonstrate general shop safety rules and procedures using Occupational Safety and Health Administration (OSHA) standards.
MBR 1.2	Utilize safe procedures for handling of tools and equipment.
MBR 1.3	Demonstrate safe use of floor jacks and lifts.
MBR 2: Utilize service information.	
MBR 2.1	Utilize the vehicle identification number (VIN) to find vehicle specific information.
MBR 2.2	Utilize sources of service information, such as electronic service manuals, to identify Technical Service Bulletins (TSBs) and service literature.
MBR 3: Perform basic vehicle service.	
MBR 3.1	Perform basic vehicle service. ● Determine fluid type requirements and identify fluid. ● Check and adjust engine oil. ● Check and adjust engine coolant level. ● Check and adjust power steering fluid level. ● Check and adjust brake fluid level. ● Check and adjust windshield washer fluid level. ● Check and adjust differential /transfer case fluid level. ● Check and adjust transmission fluid level. ● Check and replace wiper blades. ● Inspect drive belts. ● Inspect and replace air filter. ● Check and adjust tire air pressure. ● Inspect exhaust system.
MBR 4: Inspect and repair engine.	
MBR 4.1	Identify parts and demonstrate repair of engines.
MBR 4.2	Test and perform actions necessary to repair engine.
MBR 4.3	Perform cooling system service.
MBR 4.4	Perform oil and filter change; reset oil life monitoring system where applicable.
MBR 5: Repair suspension and steering.	
MBR 5.1	Diagnose suspension and steering; determine necessary action.

MBR 5.2	Inspect and repair tire and wheel assembly.
MBR 6: Inspect, diagnose and repair brake assembly.	
MBR 6.1	Diagnose and repair brake fluid system. ● Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and support; determine necessary action. ● Select, handle, and fill brake fluids to proper level. ● Bleed brake system. ● Test brake fluid for contamination; determine necessary action.
MBR 6.2	Inspect and repair brake shoes and drum assemblies. ● Remove, clean, inspect and measure brake drums; determine necessary action. ● Refinish brake drum; measure final drum diameter. ● Remove, clean, inspect brake shoes, springs, pins, clips, levers, adjuster/self-adjuster, other related brake hardware, and backing support plates; lubricate and reassemble. ● Inspect and install wheel cylinders. ● Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings. ● Install wheel, torque lug nuts, and make final checks and adjustments.
MBR 6.3	Inspect and repair caliper assembly. ● Remove caliper assembly; inspect for leaks and damage to caliper housing; determine necessary action. ● Clean and inspect caliper mounting and slides/pins for wear, operation and damage; determine necessary action. ● Remove, inspect and replace pads and retaining hardware; determine necessary action. ● Reassemble, lubricate, and reinstall caliper, pads and related hardware; seat pads and inspect for leaks.
MBR 6.4	Inspect and repair rotor assembly. ● Clean, inspect and measure rotor thickness, lateral runout and thickness variation; determine necessary action. ● Remove and reinstall rotor. ● Refinish rotor on vehicle; measure final rotor thickness. ● Refinish rotor off vehicle; measure final rotor thickness. ● Install wheel, torque lug nuts, and make final checks and adjustments.
MBR 6.5	Inspect and repair vacuum supply. ● Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.

	● Inspect vacuum-type power booster unit for leaks; inspect the check valve for proper operation; verify proper booster function. ● Demonstrate knowledge of the causes of wheel bearing noises, wheel shimmy and vibration concerns. ● Check parking brake cables and components for wear, binding and corrosion; clean, lubricate, adjust or replace as needed.
MBR 6.6	Inspect and repair brake indicator light components. ● Check parking brake and indicator light system operation; determine necessary action. ● Check operation of brake stop light system; determine necessary action. ● Replace tapered roller wheel bearing and race. ● Clean, inspect, lubricate, install and adjust wheel bearing. ● Identify and inspect electronic brake control system components; determine necessary action. ● Demonstrate knowledge of the operation of the brake hydraulic failure warning light.
MBR 7: Inspect, test and repair electrical/electronic systems.	
MBR 7.1	Diagnose electrical circuit problems. ● Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (Ohm's Law). ● Demonstrate use of wiring diagrams during diagnosis of electrical circuit problems. ● Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems, including source voltage, voltage drop, current flow and resistance. ● Check electrical circuits with a test light; determine necessary action. ● Check electrical circuits using fused jumper wires; determine necessary action. ● Demonstrate knowledge of the causes and effects of shorts, grounds, opens and resistance problems in electrical/electronic circuits. ● Measure key-off battery drain (parasitic draw); determine necessary action. ● Inspect and test fusible links, circuit breakers and fuses; determine necessary action. ● Inspect and test switches, connectors, relays and wires of electrical/electronic circuits. ● Repair connectors and terminal ends. ● Perform solder repair of electrical wiring.
MBR 7.2	Inspect and repair battery problems. ● Perform battery state-of-charge test; determine necessary action. ● Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. ● Maintain or restore electronic memory functions.

	● Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps and hold-downs. ● Perform battery charge. ● Start a vehicle using jumper cables and a battery or auxiliary power supply.
MBR 7.3	Diagnose and repair starter. ● Perform starter current draw tests; determine necessary action. ● Perform starter circuit voltage drop tests; determine necessary action. ● Inspect and test starter relays and solenoids; determine necessary action. ● Remove and replace starter.
MBR 7.4	Diagnose and repair charging system. ● Perform charging system output test; determine necessary action. ● Remove and replace generator (alternator). ● Diagnose the cause of dim, or no light operation; determine necessary action. ● Inspect, replace, and aim headlights and bulbs.
MBR 8: Inspect, diagnose and repair heating and air conditioning.	
MBR 8.1	Identify and visually inspect A/C system components. ● Locate refrigerant label and identify specified refrigerant type (e.g., R-12, R-134a). ● Conduct preliminary performance test of A/C system and determine necessary action. ● Conduct performance test of the heater/ventilation system. ● Inspect and replace cabin air filter.
MBR 9: Inspect, diagnose and improve engine performance.	
MBR 9.1	Perform the necessary tests and repairs to improve engine performance.
MBR 9.2	Obtain and interpret scan tool data. ● Perform cylinder cranking compression test; determine necessary action.
MBR 9.3	Retrieve and record stored diagnostic trouble codes, On-Board Diagnostics (OBD) monitor status and freeze frame data; clear codes when applicable.
MBR 10: Understand vehicle systems and basic repairs.	
MBR 10.1	Understand drive trains.
MBR 10.2	Check and inspect an automatic transmission.
MBR 10.3	Explain manual drive train and axles.
MBR 10.4	Repair suspension and steering.
MBR 10.5	Inspect, diagnose and service brake assembly.
MBR 10.6	Inspect, test and repair electrical/electronic systems.

MBR 10.7	Inspect, diagnose and repair heating and air conditioning.
MBR 11: Understand and apply appropriate business practices to engine repair and maintenance.	
MBR 11.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
MBR 11.2	Apply ethical business practices.
MBR 11.3	Apply excellent customer relations practices.
MBR 12: Explore the multiple careers in the industry.	
MBR 12.1	Investigate automotive maintenance related career fields and occupations.
MBR 12.2	Compare education and training available for careers in automotive maintenance (e.g., apprenticeships, technical colleges).

Electrical/Electronic Systems and Heating Ventilation Air Conditioning (HVAC) - 20105	
ESH 1: Demonstrate automotive technology safety practices.	
ESH 1.1	Identify and demonstrate general shop safety rules and procedures using Occupational Safety and Health Administration (OSHA) standards.
ESH 2: Perform maintenance, diagnostic and repair procedures of electrical/electronic systems.	
ESH 2.1	Identify vehicle electrical/electronic system components and configuration.
ESH 2.2	Utilize electrical service tools to check operation of electrical circuits.
ESH 2.3	Test and repair electrical problems. ● Measure key-off battery drain (parasitic draw). ● Inspect and test fusible links, circuit breakers, and fuses; determine necessary action. ● Repair and/or replace connectors, terminal ends, and wiring of electrical/electronic systems (including solder repair). ● Use wiring diagrams to trace electrical/electronic circuits.
ESH 2.4	Demonstrate knowledge of electrical/electronic series, parallel, and series and parallel circuits using principles of electricity (Ohm's Law).
ESH 2.5	Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance. • Diagnose shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
ESH 3: Perform maintenance, diagnostic and repair procedures on battery systems.	
ESH 3.1	Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting the vehicle battery.
ESH 3.2	Service battery. ● Perform battery state-of-charge test; determine necessary action. ● Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine necessary action. ● Maintain or restore electronic memory functions. ● Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. ● Perform slow/fast battery charge according to manufacturer's recommendations. ● Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.
ESH 3.3	Research safety procedures with high voltage battery systems on electric, hybrid electric, and diesel vehicles.
ESH 4: Perform maintenance, diagnostic and repair procedures of starting systems.	

ESH 4.1	Explain the starting systems purpose and operation.
ESH 4.2	Inspect and repair starting system. ● Perform starter current draw test; determine necessary action. ● Perform starter circuit voltage drop tests; determine necessary action. ● Inspect and test starter relays and solenoids; determine necessary action.
ESH 5: Perform maintenance, diagnostic and repair procedures of the charging system.	
ESH 5.1	Remove, inspect, and replace charging system components. ● Perform charging system output test; determine necessary action. ● Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.
ESH 6: Identify and perform repair procedures of electrical systems.	
ESH 6.1	Identify and inspect lighting, instrument cluster, driver information, and body electrical systems and verify operation.
ESH 6.2	Perform repair operations on electrical systems.
ESH 7: Research electric-powered and hybrid vehicles and components.	
ESH 7.1	Research safety procedures with hybrid vehicles and their components.
ESH 7.2	Research charging systems.
ESH 7.3	Research high output motors and components.
ESH 8: Research and identify heating, ventilation, and air conditioning components.	
ESH 8.1	Obtain vehicle service information on heating and air conditioning components.
ESH 9: Inspect and understand repair procedures for the refrigeration system.	
ESH 9.1	Demonstrate an understanding of repair procedures for refrigeration system components.
ESH 10: Perform repair procedures for the heating and cooling system.	
ESH 10.1	Analyze heating and engine cooling systems problems.
ESH 11: Perform inspection and identification procedures for the heating, ventilation and air conditioning (HVAC) system.	
ESH 11.1	Inspect and identify operating systems and related controls.
ESH 12: Understand and apply appropriate business practices to repair and maintenance.	
ESH 12.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.

ESH 12.2	Apply ethical business practices.
ESH 12.3	Apply excellent customer relations practices.
ESH 13: Explore the multiple careers in the industry.	
ESH 13.1	Investigate electrical/electronic systems and HVAC related career fields and required education or training.

Introduction to Commercial Driver's License (CDL) Theory - 20999	
ICDL 1: Understand the procedures to obtain a CDL.	
ICDL 1.1	Identify the steps needed to obtain a South Dakota Commercial Driver's License.
ICDL 1.2	Explain the importance of compliance with applicable regulations.
ICDL 1.3	Recognize the personal choices and behaviors that impact the ability to obtain and maintain a CDL.
ICDL 2: Demonstrate safety precautions in the operation of a tractor-trailer truck.	
ICDL 2.1	Identify highway signs and the meanings of each.
ICDL 2.2	Discuss rules of the road and Department of Transportation (DOT) regulations.
ICDL 2.3	Demonstrate knowledge of hours of service.
ICDL 3: Demonstrate a pre-trip vehicle inspection.	
ICDL 3.1	Identify key parts and systems found in a tractor-trailer.
ICDL 3.2	Identify safety procedures to follow prior to a trip.
ICDL 3.3	Demonstrate how to safely perform an accurate and efficient vehicle inspection.
ICDL 4: Perform basic operations of a tractor-trailer truck.	
ICDL 4.1	Explain how to safely couple and uncouple a trailer from a truck.
ICDL 4.2	Identify the correct spacing between vehicles.
ICDL 4.3	Demonstrate proper upshifting and downshifting of a manual transmission.
ICDL 4.4	Demonstrate safely coupling and uncoupling a trailer from a tractor.
ICDL 4.5	Demonstrate parking a combination vehicle.
ICDL 4.6	Demonstrate driving in hazardous weather conditions.
ICDL 5: Explore the multiple careers that would require a CDL.	
ICDL 5.1	Research CDL needs within a variety of career clusters such as supply chain and transportation, architecture and construction, and agriculture.
ICDL 5.2	Identify steps necessary to complete the CDL exam and credentialing process.

Diesel Technology - 20107	
DT 1: Adhere to health and safety standards in the workplace, including systems and procedures.	
DT 1.1	Identify and demonstrate general shop safety rules and procedures using Occupational Safety and Health Administration (OSHA) standards.
DT 2: Explain basic electricity and electronics principles relating to diesel equipment.	
DT 2.1	Demonstrate basic electricity and electronic principles that apply to diesel powered equipment, including starting, charging, lighting and accessories.
DT 2.2	Perform basic electrical repair procedures.
DT 3: Demonstrate understanding of basic aspects of diesel engines.	
DT 3.1	Explain advantages and disadvantages of diesel engines.
DT 3.2	Explore combustion chambers and processes in diesel engines.
DT 3.3	Explain the purpose of forced induction to create efficiencies in diesel engines.
DT 3.4	Identify tier ratings for exhaust emissions up to tier four. ● Identify the regulations and components for each tier level.
DT 4: Demonstrate how basic braking systems operate.	
DT 4.1	Identify and understand basic vehicle braking systems, including hydraulic and air brake systems. ● Explore the principles of brakes. ● Demonstrate the hydraulic drum brake rebuild procedure. ● Demonstrate the hydraulic disc brake rebuild procedure. ● Understand different types of power brakes. ● Explain the operation of brake valves. ● Examine the fundamentals of the air system.
DT 5: Apply principles of fuel systems on diesel engines.	
DT 5.1	Differentiate between fuel delivery systems.
DT 5.2	Identify principles, components, systems and circuits for fuel delivery systems.
DT 5.3	Analyze fuel injection components and principles.
DT 6: Apply appropriate business practices to diesel technology.	
DT 6.1	Demonstrate the importance of, and the procedures for, maintaining accurate records and billing.
DT 6.2	Understand the concept and application of ethical business practices.
DT 6.3	Apply excellent customer relations practices.

DT 7: Explore the multiple careers in the diesel industry.	
DT 7.1	Research career opportunities within a variety of career clusters such as supply chain and transportation, architecture and construction, and agriculture.
DT 7.2	Compare education and training available for electronics and electrical related careers (e.g., apprenticeships, technical colleges, and universities).

Small Engine Mechanics - 20110	
SEM 1: Demonstrate shop and tool safety.	
SEM 1.1	Identify and demonstrate general shop safety rules and procedures using Occupational Safety and Health Administration (OSHA) standards.
SEM 1.2	Demonstrate proper use of hand and power tools used small engine repair.
SEM 2: Apply mathematics and science knowledge and skills to small engine mechanics.	
SEM 2.1	Determine horsepower of any small engine using the formula: HP=W/(T*33,000). (HP = Horsepower, W = Work, T = Time).
SEM 2.2	Explain the principle that fluids cannot be compressed by building a basic hydraulic cylinder/motor device.
SEM 2.3	Perform mathematical calculations and measurements commonly used in small engines. ● Calculate displacement of any given engine based on the equation d=c*b2s (c-constant 0.7584, b-bore, s-stroke, d-displacement). ● Find the amount of work with the equation w=f*d (w=work in lb./ft (ftlb), f=force in pounds, d=distance).
SEM 3: Troubleshoot an internal combustion engine.	
SEM 3.1	Implement strategic diagnostic procedures.
SEM 3.2	Conduct preventive maintenance on an internal combustion engine.
SEM 3.3	Analyze the operations of a fuel system, diagnose issues and perform service.
SEM 3.4	Analyze the operation of emission systems, diagnose issues and perform service.
SEM 4: Properly test, diagnose, service, and repair charging and electrical systems related to small engines.	
SEM 4.1	Illustrate the application of Ohm's Law to charging and electrical systems related to small engines. ● Complete the start amp draw test on a small engine with an electric start system. ● Compute amperage use of any circuit by using the equation amps=volts/ohms (I = V/R).
SEM 4.2	Interpret schematics, diagrams, and reference information used in small engine electrical systems. ● Troubleshoot the charging circuit using a manufacturer's guide. ● Read a multimeter.
SEM 4.3	Use strategy-based diagnostics for determining the cause of a fault in an electrical circuit. ● Test, diagnose, and service batteries and charging systems.

	● Test, diagnose, and service light systems. ● Demonstrate the use of equipment and tools for electrical testing and diagnosis. ● Troubleshoot and repair starting circuit.
SEM 4.4	Inspect and repair battery problems. ● Perform battery state-of-charge test; determine necessary action. ● Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. ● Maintain or restore electronic memory functions. ● Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps and hold-downs. ● Charge a battery following manufacturer specifications. Start a vehicle using jumper cables and a battery or auxiliary power supply.
SEM 4.5	Diagnose and repair starter. ● Perform starter current draw tests; determine necessary action. ● Perform starter circuit voltage drop tests; determine necessary action. ● Inspect and test starter relays and solenoids; determine necessary action. ● Remove and replace starter.
SEM 4.6	Diagnose and repair charging system. ● Perform charging system output test; determine necessary action. ● Remove and replace generator (alternator). ● Diagnose the cause of dim or no light operation; determine necessary action. ● Inspect, replace, and aim headlights and bulbs.
SEM 5: Apply appropriate business practices to small engines repair and maintenance.	
SEM 5.1	Demonstrate the importance of, and the procedures for, maintaining accurate records and billing.
SEM 5.2	Understand the concept and application of ethical business practices.
SEM 5.3	Apply excellent customer relations practices.
SEM 6: Explore the multiple careers in the industry.	
SEM 6.1	Investigate small engine related career fields and required education or training.

Automotive Engine Repair and Performance - 20121	
AERP 1: Demonstrate automotive technology safety practices.	
AERP 1.1	Demonstrate automotive technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
AERP 1.2	Demonstrate an understanding of Environmental Protection Agency (EPA) regulations regarding waste gases, emissions, and other environmentally hazardous substances.
AERP 1.3	Demonstrate the safe and proper use of hand and power tools.
AERP 2: Prepare the vehicle for service.	
AERP 2.1	Perform preparatory procedures for vehicle service. • Identify information needed and the service requested on a repair order. • Identify purpose and demonstrate proper use of fender covers. • Demonstrate use of the Three C's: Concern, Cause, and Correction. • Review vehicle service history.
AERP 3: Perform engine maintenance and repair.	
AERP 3.1	Perform engine maintenance operations. • Research vehicle service information, including fluid type, vehicle service history, service precautions, and Technical Service Bulletins (TSB's). • Verify operation of the instrument panel engine warning indicators. • Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. • Install engine covers using gaskets, seals, and sealers as required. • Verify engine mechanical timing. • Perform common fastener and thread repair to include removing broken bolt, restoring internal and external threads, and repairing internal threads with thread insert.
AERP 3.2	Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.
AERP 3.3	Test, inspect, and perform maintenance on the lubrication and cooling system. • Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine necessary action. • Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment. • Remove, inspect, and replace thermostat and gasket/seal. • Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required. • Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required. • Identify components of the lubrication and cooling systems.

AERP 4: Perform engine repair.	
AERP 4.1	Verify bearing clearances and identify signs of failure.
AERP 4.2	Verify crankshaft endplay.
AERP 4.3	Apply measuring principles to engines (e.g., ring gap on pistons, journals on crankshaft, fastener torque, and camshaft).
AERP 4.4	Inspect installation and proper torque specs.
AERP 4.5	Measure and inspect cylinder walls.
AERP 5: Test, diagnose, and repair engine performance issues.	
AERP 5.1	Perform engine diagnostics and analyze retrieved data. • Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins. • Perform engine absolute manifold pressure tests (MAP tests); document results. • Perform cylinder power balance test; document results. • Perform cylinder cranking and running compression tests; document results. • Perform cylinder leakage test; document results. • Verify engine operating temperature. • Remove and replace spark plugs; inspect secondary ignition components for wear and damage.
AERP 5.2	Test the computerized controls and analyze retrieved data. • Retrieve and record diagnostic trouble codes (DTC), On-board Diagnostic (OBD) monitor status, and freeze frame data; clear codes when applicable. • Interpret OBD monitor data for repair verification.
AERP 5.3	Perform maintenance operations on emissions control system. • Inspect, test, and service Positive Crankcase Ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform necessary action.
AERP 5.4	Inspect cylinder head and valve train components. • Adjust valves (mechanical or hydraulic lifters). • Identify components of the cylinder head and valve train.
AERP 6: Explore the multiple careers in the automotive industry.	
AERP 6.1	Investigate automotive maintenance related career fields and occupations.
AERP 6.2	Compare education and training available for careers in automotive maintenance (e.g., apprenticeships, technical colleges).

Brakes, Drivetrain, and Axles - 20122	
BDA 1: Demonstrate automotive technology safety practices.	
BDA 1.1	Demonstrate automotive technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
BDA 1.2	Research vehicle service information utilizing electronic databases to research Technical Service Bulletins (TSBs)and service literature for related systems.
BDA 2: Demonstrate knowledge of brake system theory and procedure.	
BDA 2.1	Identify brake system components and configuration.
BDA 2.2	Analyze and diagnose automotive brake hydraulic and friction systems. ● Identify and interpret brake system concerns; determine needed action. ● Describe the procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS).
BDA 3: Demonstrate knowledge and procedure of the hydraulic brake system.	
BDA 3.1	Diagnose malfunctions of hydraulic brake systems. ● Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). ● Check master cylinder for internal/external leaks and proper operation; determine needed action. ● Identify components of hydraulic brake warning light system. ● Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.
BDA 3.2	Apply repair skills to correct malfunctions of hydraulic brake systems. ● Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports; determine needed action. ● Remove, bench bleed, and reinstall master cylinder. ● Replace brake lines, hoses, fittings, and supports. ● Fabricate brake lines using proper material and flaring procedures (double flare and ISO types). ● Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer's specifications. ● Inspect, test, and/or replace components of brake warning light system. ● Bleed and/or flush brake system. ● Test brake fluid for contamination. ● Measure brake pedal height, travel, and free play (as applicable); determine needed action.
BDA 4: Demonstrate knowledge of theory and repair procedures for drum brake systems.	
BDA 4.1	Assess and evaluate operation of drum brake systems. ● Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action.

BDA 4.2	Repair drum brake systems. ● Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability. ● Refinish brake drum and measure final drum diameter; compare with manufacturer's specifications. ● Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. ● Inspect wheel cylinders for leaks and proper operation; remove and replace as needed. ● Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.
BDA 5: Demonstrate knowledge of theory and repair procedures for disc brake systems.	
BDA 5.1	Assess and evaluate operation of disc brake systems. ● Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action. ● Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action. ● Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations.
BDA 5.2	Repair disc brake systems. ● Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action. ● Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads; inspect for leaks. ● Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action. ● Remove and reinstall/replace rotor. ● Refinish rotor on vehicle; measure final rotor thickness and compare with specifications. ● Refinish rotor off vehicle; measure final rotor thickness and compare with specifications. ● Retract and re-adjust caliper piston on an integrated parking brake system. ● Check brake pad wear indicator; determine needed action. ● Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action.
BDA 6: Demonstrate knowledge of theory and repair procedures for power assist units.	
BDA 6.1	Analyze power-assist units.
BDA 7: Demonstrate knowledge of theory and repair procedures for related systems: wheel bearings, parking brakes, and electrical.	

BDA 7.1	Diagnose wheel bearings. ● Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.
BDA 7.2	Diagnose and repair parking brakes. ● Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed. ● Check parking brake operation and parking brake indicator light system operation; determine needed action. ● Check operation of brake stop light system.
BDA 7.3	Repair related systems. ● Replace wheel bearing and race. ● Inspect and replace wheel studs. ● Remove, reinstall, and/or replace sealed wheel bearing assembly. ● Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.
BDA 8: Demonstrate knowledge of theory and repair procedures for related systems – antilock brake systems (ABS), traction control systems (TCS), electronic stability control (ESC).	
BDA 8.1	Diagnose electronic brake control systems: ABS, TCS and ESC Systems ● Identify and inspect electronic brake control system components (ABS, TCS, ESC); determine needed action. ● Describe the operation of a regenerative braking system.
BDA 9: Demonstrate knowledge of theory and repair procedures for manual drivetrain and axles.	
BDA 9.1	Identify manual transmission information. ● Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. ● Identify manual drivetrain and axle components and configuration.
BDA 10: Perform maintenance procedures for hydraulic clutches.	
BDA 10.1	Explain clutch hydraulic system. ● Diagnose master cylinder fluid level; use proper fluid type per manufacturer's specifications. ● Check for hydraulic system leaks.
BDA 11: Define the operation of electronic manual transmission/transaxle.	
BDA 11.1	Research manual transmission/transaxle systems. ● Describe the operational characteristics of an electronically controlled manual transmission/transaxle.
BDA 12: Inspect, diagnose, and perform repair procedures for drivetrain components.	
BDA 12.1	Inspect, diagnose, and repair drive shaft, half shafts, universal joints and constant-velocity (CV) joints.
BDA 13: Inspect, diagnose, and perform repair procedures for the differential assembly.	

BDA 13.1	Perform maintenance on differential case assembly.
BDA 14: Understand and apply appropriate business practices related to automotive repair businesses.	
BDA 14.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
BDA 14.2	Apply ethical business practices.
BDA 14.3	Apply excellent customer relations practices.
BDA 15: Explore the multiple careers in the automotive industry.	
BDA 15.1	Investigate automotive maintenance related career fields and occupations.
BDA 15.2	Compare education and training available for careers in automotive maintenance (e.g., apprenticeships, technical colleges).

Transmission, Suspension, and Steering - 20123	
TSS 1: Demonstrate automotive technology safety practices for an automotive repair facility.	
TSS 1.1	Demonstrate automotive technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
TSS 2: Demonstrate proper tool selection and usage for repairing transmissions and suspensions.	
TSS 2.1	Demonstrate proper tool selection and usage.
TSS 3: Perform diagnostics and repair on the vehicle's automatic transmission and transaxle.	
TSS 3.1	Inspect and identify drivetrain components.
TSS 3.2	Perform maintenance on vehicle automatic transmission and transaxle while on the vehicle.
TSS 3.3	Analyze the vehicle's automatic transmission and transaxle while off the vehicle.
TSS 3.4	Describe the operational characteristics of a continuously variable transmission (CVT).
TSS 4: Perform maintenance on vehicle suspension and steering systems.	
TSS 4.1	Inspect, Identify, and repair wheels and tires. • Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label. • Rotate tires according to manufacturer's recommendations including vehicles equipped with tire pressure monitoring systems (TPMS). • Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly. • Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor. • Inspect tire and wheel assembly for air loss; determine necessary action. • Repair tire following vehicle manufacturer approved procedure. • Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate system; verify operation of instrument panel lamps. • Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure.
TSS 4.2	Analyze and evaluate the suspension and steering system components. • Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. • Disable and enable supplemental restraint system (SRS); verify indicator lamp operation. • Identify suspension and steering system components and configurations.

TSS 4.3	Inspect and assess the suspension and steering system. • Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. • Inspect power steering fluid level and condition. • Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification. • Inspect for power steering fluid leakage. • Remove, inspect, replace, and/or adjust power steering pump drive belt. • Inspect and replace power steering hoses and fittings. • Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper. • Inspect tie rod ends (sockets), tie rod sleeves, and clamps. • Inspect upper and lower control arms, bushings, and shafts. • Inspect and replace rebound bumpers. • Inspect track bar, strut rods/radius arms, and related mounts and bushings. • Inspect upper and lower ball joints (with or without wear indicators). • Inspect suspension system coil springs and spring insulators (silencers). • Inspect suspension system torsion bars and mounts. • Inspect and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links. • Inspect, remove, and/or replace strut cartridge or assembly; inspect mounts and bushings. • Inspect front strut bearing and mount. • Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms. • Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts. • Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings. • Inspect electric power steering assist system. • Identify hybrid vehicle power steering system electrical circuits and safety precautions. • Describe the function of suspension and steering control systems and components, (e.g., active suspension, and stability control).
TSS 4.4	Inspect and measure vehicle wheel alignment. • Perform pre-alignment inspection; measure vehicle ride height. • Describe alignment angles (camber, caster, and toe).
TSS 5: Demonstrate appropriate business practices relating to engine repair businesses.	
TSS 5.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
TSS 5.2	Apply ethical business practices.

TSS 5.3	Apply excellent customer relations practices.
TSS 6: Explore the multiple careers in the automotive industry.	
TSS 6.1	Investigate automotive maintenance related career fields and occupations.
TSS 6.2	Compare education and training available for careers in automotive maintenance (e.g., apprenticeships, technical colleges).

Powersports	
PS 1: Demonstrate shop and tool safety.	
PS 1.1	Demonstrate technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
PS 1.2	Demonstrate proper use of hand and power tools. ● Perform a general tool test (name and function of tool being used, proper use of each tool, care and storage). ● Review torque wrench settings and usage. ● Spark test tools (use appropriate spark tester to check spark).
PS 2:	**Explore the powersports industry as category of sporting and recreational motorized vehicles designed for off-road, water, or snow use.**
PS 2.1	Describe major categories of powersports equipment (ATV's, UTV's, motorcycles, personal watercrafts, snowmobiles, etc.)
P 2.2	Investigate the need for specialized powersports technicians
PS 2.3	Research the powersports industry and its impact on the South Dakota economy.
PS 3: Troubleshoot an internal combustion engine.	
PS 3.1	Implement strategic diagnostic procedures.
PS 3.2	Conduct preventative maintenance on an internal combustion engine. ● Inspect and change oil and oil filter. ● Inspect and change air filter. ● Disassemble, clean, and inspect fuel pump. ● Disassemble, clean, and inspect carburetor.
PS 3.3	Analyze the functions and operations of a fuel system related to powersports vehicles. ● Complete fuel pressure test of system utilizing a fuel pump. ● Set carburetor float height. ● Adjust both low and high idle circuits on carburetor engines. ● Complete fuel injector function test on fuel injected engines.
PS 3.4	Diagnose fuel system problems. ● Test and determine needed repair on fuel system. ● Inspect and determine needed repair on air cleaner system.
PS 3.5	Perform fuel system service. ● Remove and replace the fuel tank, fuel lines and fuel filter system. ● Service oil-bath or foam type air cleaner. ● Reassemble and adjust a carburetor. ● Reassemble and install fuel pump.

PS 3.6	Analyze the function and operation of emission systems related to powersports vehicles. ● Research Environmental Protection Agency (EPA) emissions standards and requirements. ● Explain how emissions regulations affect the small engine service industry.
PS 3.7	Diagnose emission systems relating to powersports vehicles.
PS 4: Properly test, diagnose, service, and repair charging and electrical systems.	
PS 4.1	Inspect and repair battery problems. ● Perform battery state-of-charge test; determine necessary action. ● Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. ● Maintain or restore electronic memory functions. ● Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps and hold-downs. ● Perform battery charge. ● Start a vehicle using jumper cables and a battery or auxiliary power supply.
PS 4.2	Diagnose and repair starter. ● Perform starter current draw tests; determine necessary action. ● Perform starter circuit voltage drop tests; determine necessary action. ● Inspect and test starter relays and solenoids; determine necessary action. ● Remove and replace starter.
PS 4.3	Diagnose and repair charging system. ● Perform charging system output test; determine necessary action. ● Remove and replace generator (alternator). ● Diagnose the cause of dim, or no light operation; determine necessary action. ● Inspect, replace, and aim headlights and bulbs.
PS 4.4	Understand safety aspects of supplemental restraint systems (SRS), electronic brake control systems and hybrid vehicle high voltage circuits.
PS 4.5	Understand and demonstrate awareness of the safety aspects of high voltage circuits (e.g., high intensity discharge (HID) lamps, ignition systems, injection systems).
PS 4.6	Utilize safe procedures for operating electric vehicles and systems.
PS 5: Inspect, diagnose and repair drivetrain, transmission, axles and final drive components.	
PS 5.1	Demonstrate understanding of drivetrain components to include primary transmission and final drive components. ● Drain transmission fluid. ● Visually inspect the amount of debris in oil pan. ● Remove filter and install new filter. ● Install the proper fluid to the proper level.

PS 5.2	Diagnose and repair drive train and axles. ● Diagnose fluid loss, level, and condition concerns; determine necessary action. ● Drain and fill transmission/transaxle and final drive unit. ● Identify and inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine necessary action. ● Identify and inspect hydraulic clutch slave and master cylinders, lines and hoses; determine necessary action. ● Bleed clutch hydraulic system. ● Inspect constant velocity (CV) joint boots. ● Remove and replace rear wheel drive shaft.
PS 6: Repair suspension and steering.	
PS 6.1	Diagnose suspension and steering; determine necessary action. ● Determine proper power steering fluid types. ● Flush, fill and bleed power steering system. ● Diagnose power steering fluid leakage; determine necessary action. ● Lubricate suspension and steering systems. ● Inspect, remove and replace shock absorbers. ● Inspect and install stabilizer bar bushings, brackets, and links. ● Inspect and install strut cartridge or assembly, coil spring, insulators (silencers), and upper strut mount. ● Perform pre-alignment inspection and measure vehicle ride height; determine necessary action. ● Demonstrate knowledge of the principles of steering geometry using caster, camber and toe.
PS 6.2	Inspect and repair tire and wheel assembly. ● Diagnose tire wear patterns; determine necessary action. ● Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action. ● Identify vehicles equipped with a tire pressure monitoring system (TPMS). ● Demonstrate knowledge of service considerations of vehicles equipped with a TPMS. ● Rotate tires according to manufacturer's recommendations. ● Balance wheel and tire assembly (static and dynamic). ● Dismount, inspect, and remount tire on wheel. ● Repair tire using internal patch. ● Reinstall wheel; torque lug nuts.
PS 7: Inspect, diagnose and repair brake assembly.	
PS 7.1	Diagnose and repair brake fluid system. ● Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and support; determine necessary action.

	● Select, handle, and fill brake fluids to proper level. ● Bleed brake system. ● Test brake fluid for contamination; determine necessary action.
PS 7.2	Inspect and repair brake assemblies. ● Remove, clean, inspect and measure brake drums; determine necessary action. ● Refinish brake drum; measure final drum diameter. ● Remove, clean, inspect brake shoes, springs, pins, clips, levers, adjuster/self-adjuster, other related brake hardware, and backing support plates; lubricate and reassemble. ● Inspect and install wheel cylinders. ● Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings. ● Install wheel, torque lug nuts, and make final checks and adjustments.
PS 7.3	Inspect and repair brake indicator light components. ● Check parking brake and indicator light system operation; determine necessary action. ● Check operation of brake stop light system; determine necessary action. ● Replace tapered roller wheel bearing and race. ● Clean, inspect, lubricate, install and adjust wheel bearing. ● Identify and inspect electronic brake control system components; determine necessary action. ● Demonstrate knowledge of how the brake hydraulic failure warning light operates.
PS 8: Inspect, diagnose and repair heating and air conditioning.	
PS 8.1	Identify and visually inspect air conditioning (A/C) system components. ● Locate refrigerant label and identify specified refrigerant type (e.g., R-12, R-134a). ● Conduct preliminary performance test of A/C system and determine necessary action. ● Conduct performance test of the heater/ventilation system. ● Inspect and replace cabin air filter.
PS 9: Inspect, diagnose and improve engine performance.	
PS 9.1	Perform the necessary tests and repairs to improve engine performance. ● Perform engine cranking and running vacuum tests; determine necessary action. ● Perform cylinder power balance test; determine necessary action. ● Perform cylinder cranking compression test; determine necessary action. ● Perform cylinder leakage test; determine necessary action. ● Verify engine operating temperature; determine necessary action. ● Retrieve and record stored diagnostic trouble codes, On-Board Diagnostics (OBD) monitor status and freeze frame data; clear codes when applicable.

	● Obtain and interpret scan tool data. ● Remove and replace secondary ignition components. ● Remove and replace thermostat and gasket/seal. ● Perform common fastener and thread repair, to include: removing broken bolt, restoring internal and external threads, and repairing internal threads with a threaded insert.
PS 10: Demonstrate appropriate business practices in a powersports business.	
PS 10.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
PS 10.2	Apply ethical business practices.
PS 10.3	Apply excellent customer relations practices.
PS 11: Explore the multiple careers in the powersports industry.	
PS 11.1	Investigate power sports related career fields and education/ training opportunities.

Introduction to Auto Body and Estimating – 20124	
IABE 1: Students will demonstrate understanding of auto body safety practices and careers.	
IABE 1.1	● Demonstrate autobody technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
	●
IABE 2: Demonstrate uses of auto body tools and equipment.	
IABE 2.1	Demonstrate hand and power tools and their uses. ● Name tools and their uses. ● Differentiate between pneumatic and electric. ● Demonstrate appropriate safety procedures when using tools. ● Demonstrate how to maintain tools.
IABE 2.2	Analyze uses of a compressed air system. ● Components of a compressed air system. ● Compressed air system maintenance. ● Uses of compressed air. ● Safety issues when using compressed air. ● Operations of a compressed air system. ● Demonstrate use of compressed air in different operations.
IABE 3: Apply the collision repair estimating processes.	
IABE 3.1	Demonstrate the process involved in obtaining important information. ● Determine and record customer/vehicle owner information. ● Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, productions date, engine type and assembly plant. ● Identify and record vehicle mileage and options, including trim level, paint code, transmission, accessories and modifications.
IABE 3.2	Demonstrate the process of writing a repair estimate. ● Position the vehicle for inspection. ● Prepare vehicles for inspection by providing access to damaged areas. ● Analyze damage to determine appropriate methods for overall repairs. ● Identify and record pre-existing damage. ● Apply appropriate estimating and parts nomenclature (terminology). ● Determine and apply appropriate estimating sequence. ● Utilize estimating guide procedure pages. ● Identify operations requiring labor value judgment.

	● Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish). ● Apply math skills to establish charges and totals. ● Identify procedural differences between computer generated and manually written estimates. ● Recognize the differences in estimation procedures when using different information provider systems.
IABE 4: Apply auto body repair and finishing techniques.	
IABE 4.1	Demonstrate basic auto body repair techniques. ● Explain proper corrosion protection methods and why you apply them. ● Demonstrate welding processes. ● Apply metal straightening techniques. ● Explain the uses of different body filler options. ● Demonstrate plastic repair techniques. ● Explain the purpose of block sanding. ● Demonstrate block sanding techniques. ● Demonstrate Hammer and Dolly procedures. ● Demonstrate proper uses of sandpaper grits.
IABE 4.2	Demonstrate processes in automotive finishing. ● Know and understand proper overspray protection. ● Demonstrate proper refinishing procedures. ● Explain proper surface preparation. ● Apply overspray protection. ● Prepare different surfaces properly. ● Demonstrate how to use refinishing equipment (including maintenance). ● Perform a spray gun test.
IABE 5: Understand and apply appropriate business practices relating to autobody businesses.	
IABE 5.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
IABE 5.2	Apply ethical business practices.
IABE 5.3	Apply excellent customer relations practices.
IABE 6: Explore the multiple careers in the autobody industry.	
IABE 6.1	Investigate autobody related career fields and occupations.
IABE 6.2	Compare education and training available for careers in autobody repair (e.g., apprenticeships, technical colleges).

Nonstructural Analysis and Damage Repair - 20115	
NADR 1: Demonstrate understanding of auto body technology safety precautions.	
NADR 1.1	Demonstrate autobody technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
NADR 2: Learn and demonstrate preparation for nonstructural repair.	
NADR 2.1	Analyze and demonstrate processes involved in preparation for nonstructural inspection and repair. ● Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan. ● Inspect, remove, label, store, and reinstall exterior trim and moldings. ● Inspect, remove, label, store, and reinstall interior trim and components. ● Inspect, remove, label, store, and reinstall body panels and components that may interfere with, or be damaged during, repair. ● Inspect, remove, protect label, store, and reinstall vehicle mechanical and electrical components that may interfere with, or be damaged during, repair. ● Protect panels, glass, interior parts, and other vehicles adjacent to the repair area. ● Soap and water wash entire vehicle; complete pre-repair inspection checklist. ● Prepare damaged area using water-based and solvent-based cleaners. ● Remove corrosion protection, undercoatings, sealers, and other protective coatings as necessary to perform repairs. ● Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.
NADR 3: Learn and demonstrate procedures for outer body panel repairs, replacements and adjustments.	
NADR 3.1	Demonstrate the processes involved in outer body panel repairs, replacements, and adjustments. ● Inspect/locate direct, indirect, or hidden damage and direction of impact. ● Inspect, remove, replace, and align hood, hood hinges, and hood latch. ● Inspect, remove, replace, and align deck lid, lid hinges, and lid latch. ● Inspect, remove, replace, and align doors, latches, hinges, and related hardware. ● Inspect, remove, replace and align tailgates, hatches, liftgates and sliding doors. ● Inspect, remove, replace, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware. ● Inspect, remove, replace and align fenders, and related panels. ● Discuss effects of inspection, removal and replacement of cameras, sensors, other electrical components. ● Restore corrosion protection during and after the repair.

	● Restore sound deadeners and foam materials. ● Diagnose and repair water leaks, dust leaks, and wind noise.
NADR 4: Perform metal finishing and body filling.	
NADR 4.1	Understand and demonstrate the processes involved in metal finishing and body filling. ● Prepare a panel for body filler by abrading or removing the coatings, featheredge, and refine scratches before the application of body filler. ● Locate and repair surface irregularities on a damaged body panel using power tools, hand tools, and weld-on pulling attachments. ● Demonstrate hammer and dolly techniques. ● Heat shrink stretched panel areas to proper contour. ● Cold shrink stretched panel areas to proper contour. ● Identify body filler defects; correct the cause and condition (pinholing, ghosting, staining, over catalyzing, etc.). ● Identify different types of body fillers. ● Shape body filler to contour; finish sand. ● Straighten contours of damaged panels to a suitable condition for body fillings or metal finishing using power tools, hand tools, and weld-on pulling attachments.
NADR 5: Demonstrate service procedures for movable glass and hardware.	
NADR 5.1	Understand and demonstrate proper repair procedures for movable glass and hardware. ● Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls. ● Inspect, adjust, repair, remove, reinstall or replace weather-stripping. ● Inspect, repair or replace, and adjust removable power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs initialize electrical components as needed.
NADR 6: Demonstrate plastic repair.	
NADR 6.1	Understand and demonstrate repair processes and use of adhesives involved in plastic repair. ● Identify the types of plastic; determine repairability. ● Clean and prepare the surface of plastic parts; identify the types of plastic repair procedures. ● Repair rigid, semi-rigid, and flexible plastic panels. ● Remove or repair damaged areas from rigid exterior composite panels. ● Replace bonded rigid exterior composite body panels; straighten or align panel supports.
NADR 7: Demonstrate appropriate business practices related to the autobody industry	
NADR 7.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.

NADR 7.2	Apply ethical business practices.
NADR 7.3	Apply excellent customer relations practices.
NADR 8: Explore the multiple careers in the autobody industry.	
NADR 8.1	Investigate autobody related career fields and occupations.
NADR 8.2	Compare education and training available for careers in autobody repair (e.g., apprenticeships, technical colleges).

Structural Analysis and Damage Repair - 20117	
SADR 1: Demonstrate auto body technology safety practices.	
SADR 1.1	• Demonstrate autobody technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
SADR 2.1	Measure and analyze structural damage. • Measure and diagnose structural damage using a tram gauge. • Analyze mash, sag, side sway, twist, and diamond damage. • Identify heat limitations and monitoring procedures for structural components. • Measure and diagnose structural damage using a three-dimensional measuring system (mechanical, electronic, and laser). • Determine the extent of direct and indirect damage and the direction of impact; document the methods and sequence of repair. • Analyze and identify crush and collapse zones.
SADR 3.1	Perform necessary repairs to the frame. • Attach vehicle to anchoring devices. • Demonstrate an understanding of structural foam applications.
SADR 3: Inspect, measure and repair unibody and unitized structures.	
SADR 3.1	Analyze and determine unibody and unitized structural damage. • Measure and diagnose unibody damage using a tram gauge. • Measure and diagnose unibody vehicles using a dedicated (fixture) measuring system. • Diagnose and measure unibody vehicles using a three-dimensional measuring system (mechanical, electronic, and laser). • Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair. • Analyze and identify crush/collapse zones.
SADR 3.2	Repair unibody and unitized structures. • Attach anchoring devices to vehicle; remove or reposition components as necessary. • Identify proper cold stress relief methods. • Determine sectioning procedures of a steel body structure. • Remove and replace damaged structural components. • Restore corrosion protection to repaired or replaced structural areas and anchoring locations.
SADR 4: Inspect and repair or replace stationary glass.	
SADR 4.1	Inspect vehicles for glass damage and determine manufacturer's specifications for glass window replacement.

	• Identify considerations for removal, handling, and installation of advanced glass systems (rain sensors, navigation, cameras, and collision avoidance systems). • Remove and reinstall or replace modular glass using recommended materials. • Check for water leaks, dust leaks, and wind noise.
SADR 5: Demonstrate proficiency in welding, cutting, and joining.	
SADR 5.1	Analyze and identify correct welding procedures to be used in auto body repair work. • Identify the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals. • Determine the correct Gas Metal Arc Welding (GMAW) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation. • Identify hazards, foam coatings and flammable materials prior to welding/cutting procedures. • Determine the joint type (butt weld with backing, lap, etc.) for weld being made. • Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation. • Identify different methods of attaching structural components (squeeze type resistance spot welding, riveting, structural adhesive, Metal Inert Gas (MIG) bronze, TIG welding, other future equipment/new techniques aligned to current industry practices, etc.).
SADR 5.2	Perform proper welding operations to specific auto body repairs. • Set up attach work clamp (ground) and adjust the GMAW welder to “tune” for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded. • Store, handle, and install high-pressure gas cylinders; test for leaks. • Determine the proper angle of the gun to the joint and direction of gun travel for the type of weld being made. • Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. • Clean and prepare the metal to be welded, assure good metal fit-up, apply weld through primer if necessary, clamp or tack as required. • Perform the following welds: plug, butt weld with and without backing, and fillet, in the flat, horizontal, vertical and overhead positions. • Perform visual evaluation and destructive test on each weld type. • Identify the causes of various welding defects; make necessary adjustments. • Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. • Identify cutting process for different substrates and locations; perform cutting operation.

SADR 6: Demonstrate appropriate business practices related to an autobody business.	
SADR 6.1	Demonstrate the importance of, and the procedures for, maintaining accurate records.
SADR 6.2	Apply ethical business practices.
SADR 6.3	Apply excellent customer relations practices.
SADR 7: Explore the multiple careers in the autobody industry.	
SADR 7.1	Investigate autobody related career fields and occupations.
SADR 7.1	Compare education and training available for careers in autobody repair (e.g., apprenticeships, technical colleges).

Auto Body Painting and Refinishing - 20116	
ABPR 1: Demonstrate painting and refinishing safety precautions.	
ABPR 1.1	Demonstrate autobody technician safety practices including requirements from Occupational Safety and Health Administration (OSHA) and Safety Data Sheets (SDS).
ABPR 2: Demonstrate surface preparation procedures.	
ABPR 2.1	Analyze areas for surface preparation. • Inspect and identify type of finish, surface condition and film thickness; develop and document a plan for refinishing using a total product system. • Identify a complimentary color or shade of undercoat to improve coverage. • Identify types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation and refinishing procedures. • Identify metal parts to be refinished; determine material needed, preparation, and refinishing procedures.
ABPR 2.2	Prepare automotive surface to be refinished. • Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. • Inspect and identify type of finish, surface condition, and film thickness. • Develop and document a plan for refinishing using a total product system. • Remove paint finish as needed. • Dry- or wet-sand areas to be refinished. • Featheredge areas to be refinished. • Apply suitable metal treatment or primer in accordance with total paint product systems. • Mask and protect areas that will not be refinished. • Demonstrate different masking techniques (recess/back masking, foam door type). • Mix primer, primer-surfacer and primer-sealer. • Identify a complimentary color or shade of undercoat to improve coverage. • Apply primer onto surface of repaired area. • Apply two-component finishing filler to minor surface imperfections. • Block sand area to which primer-surfacer has been applied. • Dry-sand area to which finishing filler has been applied. • Remove dust from area to be refinished, including cracks or moldings on adjacent areas. • Clean area to be refinished using a final cleaning solution. • Remove, with a tack rag, any dust or lint particles from the area to be refinished. • Apply suitable primer sealer to the area being refinished. • Scuff sand to remove nibs or imperfections from a sealer.

	• Apply stone chip resistant coating. • Restore caulking and seam sealers to repaired areas. • Prepare adjacent panels for blending.
ABPR 3: Demonstrate spray gun and related equipment operation.	
ABPR 3.3	Inspect, prepare, and demonstrate usage of spray gun and related equipment. • Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment). • Select spray gun setup (fluid needle, nozzle, and cap) for product being applied. • Test and adjust spray gun using fluid, air and pattern control valves. • Demonstrate an understanding of the operation of pressure spray equipment.
ABPR 4: Understand and perform paint mixing, matching, and applying automotive refinishing materials to achieve invisible repair.	
ABPR 4.1	Understand the process for mixing and matching automotive paint. • Identify color code by manufacturer's vehicle information label. • Shake, stir, reduce, catalyze/activate, and strain refinish materials. • Identify product expiration dates as applicable. • Identify and mix paint using a formula. • Identify poor hiding colors; determine necessary action. • Identify alternative color formula to achieve a blendable match. • Identify the material's equipment and preparation differences between solvent and waterborne technologies. •
ABPR 4.2	Correctly apply automotive paint to prepared surfaces. • Apply finish using appropriate spray techniques (gun arc, angle, distance, travel speed, and spray pattern overlap) for the finish being applied. • Apply selected product on test or let-down panel; check for color match. • Apply single stage topcoat. • Apply basecoat/clearcoat for panel blending and panel refinishing. • Apply basecoat/clearcoat for overall refinishing. • Remove nibs or imperfections from basecoat. • Refinish plastic parts. • Apply multi-stage coats for panel blending and overall refinishing. • Tint color using formula to achieve a blendable match.
ABPR 5: Identify causes and correction procedures for paint defects.	
ABPR 5.1	Identify paint defects, understand the causes, and correct paint defects such as: • Identify blistering (raising of the paint surface, air entrapment); correct the cause(s) and the condition.

	• Identify a dry spray appearance in the paint surface; correct the cause(s) and the condition. • Identify the presence of fish-eyes (crater-like openings) in the finish; correct the cause(s) and the condition. • Identify lifting; correct the cause(s) and the condition. • Identify clouding (mottling and streaking in metallic finishes); correct the cause(s) and the condition. • Identify orange peel; correct the cause(s) and the condition. • Identify overspray; correct the cause(s) and the condition. • Identify solvent popping in freshly painted surface; correct the cause(s) and the condition. • Identify sags and runs in paint surface; correct the cause(s) and the condition. • Identify sanding marks or sand scratch swelling; correct the cause(s) and the condition. • Identify contour mapping/edge mapping; correct the cause(s) and the condition. • Identify color difference (off-shade); correct the cause(s) and the condition. • Identify tape tracking; correct the cause(s) and the condition. • Identify low gloss condition; correct the cause(s) and the condition. • Identify poor adhesion; correct the cause(s) and the condition. • Identify paint cracking (shrinking, splitting, crow's feet or line-checking, micro-checking, etc.); correct the cause(s) and the condition. • Identify corrosion; correct the cause(s) and the condition. • Identify dirt or dust in the paint surface; correct the cause(s) and the condition. • Identify water spotting; correct the cause(s) and the condition. • Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition. • Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition. • Identify die-back conditions (dulling of the paint film showing haziness); correct the cause(s) and the condition . • Identify chalking (oxidation); correct the cause(s) and the condition. • Identify bleed-through (staining); correct the cause(s) and the condition. • Identify pin-holing; correct the cause(s) and the condition. • Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition. • Identify pigment flotation (color change through film build); correct the cause(s) and the condition.
ABPR 6: Understand and perform detailing of paint refinishing.	

ABPR 6.1	Perform final vehicle inspection. • Perform vehicle clean-up; complete quality control using a checklist. • Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc. • Sand, buff and polish fresh or existing finish to remove defects as required. • Clean interior, exterior, and glass. • Clean body openings (door jambs and edges). • Remove overspray.
ABPR 7: Explore the multiple careers in the autobody industry.	
ABPR 7.1	Investigate autobody related career fields and occupations.
ABPR 7.1	Compare education and training available for careers in autobody repair (e.g., apprenticeships, technical colleges).

Aviation and Drone Principles - 20056	
ADP 1: Identify events in the history of flight.	
ADP 1.1	Explore the history and development of flight from the ancient world to modern technology.
ADP 1.2	Analyze current trends in flight.
ADP 2: Investigate the principles of flight.	
ADP 2.1	Investigate the basic parts and control surfaces on aircraft and drones (airfoil, wings, tail, and propeller).
ADP 2.2	Investigate the four forces of flight.
ADP 2.3	Investigate basic aerodynamics.
ADP 2.4	Investigate airplane and drone stability.
ADP 3: Understand the flight environment.	
ADP 3.1	Demonstrate an understanding of the Federal Aviation Administration (FAA) regulations and air safety concerns.
ADP 3.2	Research the airport layout, inclusive of safety elements.
ADP 3.3	Discuss airspace control.
ADP 3.4	Explain radio communications.
ADP 4: Understand aircraft systems and performance.	
ADP 4.1	Identify the six basic aircraft instruments (airspeed indicator, attitude indicator, altimeter, turn coordinator, heading indicator, and vertical speed indicator).
ADP 4.2	List the basic flight control systems (mechanical, hydromechanical and fly-by-wire). • Describe the latest innovations in fly-by-wire flight control systems.
ADP 4.3	Predict aircraft performance. • Solve percentage problems (percent of power for turbine engines, flap position percent indicators). • Solve ratio and proportion problems (compression ratios of an aircraft, glide ratios).
ADP 4.4	Calculate aircraft weight and balance.
ADP 5: Understand drone systems and performance.	
ADP 5.1	Identify the six basic aircraft instruments on a drone (airspeed indicator, attitude indicator, altimeter, turn coordinator, heading indicator, and vertical speed indicator).
ADP 5.2	List the basic flight control systems (mechanical, hydromechanical and fly-by-wire). Describe the latest innovations in fly-by-wire flight control systems.
ADP 5.3	Predict aircraft performance.

	● Solve percentage problems (percent of power for turbine engines, flap position percent indicators). ● Solve ratio and proportion problems (compression ratios of an aircraft, glide ratios).
ADP 5.4	Calculate weight and balance. ● Compute empty weight center of gravity on a drone. ● Compute loaded weight and loaded weight center of gravity of a drone.
ADP 6: Understand the relationship between weather and flight.	
ADP 6.1	Explain basic weather theory. ● Explain the composition of the Earth's atmosphere. ● Explain how temperature variation influences flight performance.
ADP 6.2	Describe weather patterns and clouds. ● Analyze pressure systems at different altitudes on a surface map. ● Identify the types of clouds (stratus, cumulonimbus, and cirrus) at different elevations and the potential hazards that may exist.
ADP 6.3	Explain weather hazards. ● Compare and contrast the common weather hazards when flying ● Identify safe and corrective actions for common weather hazards as suggested by the Federal Aviation Administration (FAA).
ADP 6.4	Interpret weather data. ● Interpret current weather conditions using a weather map. ● Collect and analyze local weather data.
ADP 6.5	Identify sources of weather information. ● Explore the Significant Meteorological Information Service (SIGMET). ● Define the role of the Aviation Digital Data Service (ADDS).
ADP 7: Understand navigation in aviation.	
ADP 7.1	Understand basic navigation. ● List and describe the essential navigational information a pilot needs to know (e.g., starting point, ending point, direction, distance, speed, fuel capacity, and weight and balance). ● List the advantages and disadvantages of Visual Flight Rules (VFR) flying.
ADP 7.2	Understand dead-reckoning and pilotage. ● Define dead-reckoning and pilotage. ● Calculate a flight course using the elements of course line, airspeed, course heading and elapsed time.
ADP 7.3	Utilize the basic concepts of a flight computer or GPS programming and tracking.
ADP 7.4	Utilize aeronautical charts.
ADP 8: Understanding drone technology.	

ADP 8.1	Understand key concepts affecting safe flight of a drone. ● Evaluating performance during operations. ● Understanding restrictions and procedures for safe loading. ● Identifying safe flight areas.
ADP 8.2	Understand basic drone theory and flight. ● Understand the history of drones. ● Identify the major developments in drone flight.
ADP 8.3	Understand maintenance of drones.
ADP 9: Explore the multiple careers in aviation.	
ADP 9.1	Investigate aviation and drone related career fields and occupations.
ADP 9.2	Explore how drones are used in many other career clusters (energy and natural resources; arts, entertainment, and design; public safety and security, etc.).
ADP 9.3	Compare education and training available for careers in aviation careers (e.g., apprenticeships, technical colleges, university, and military).

Aviation Careers I - 20053	
ACI 1: Identify events in the history of flight.	
ACI 1.1	Identify flight in the ancient world.
ACI 1.2	Identify the development of flight in the early 1900s through today and beyond.
ACI 2: Investigate the principles of flight.	
ACI 2.1	Investigate the basic parts and control surfaces on aircraft.
ACI 2.2	Investigate the four forces of flight.
ACI 2.3	Investigate basic aerodynamics.
ACI 2.4	Investigate airplane stability.
ACI 3: Explore the flight environment.	
ACI 3.1	Define air safety.
ACI 3.2	Explore the airport layout, include of safety elements.
ACI 3.3	Investigate airspace control.
ACI 3.4	Practice radio communications.
ACI 4: Explore aircraft systems and performance.	
ACI 4.1	Demonstrate the basic aircraft instruments.
ACI 4.2	Explain aircraft types and systems.
ACI 4.3	Predict aircraft performance.
ACI 4.4	Calculate weight and balance.
ACI 5: Explore the multiple careers in aviation.	
ACI 5.1	Explore the requirements for a pilot license.
ACI 5.2	Explore aviation and aerospace career pathways, including opportunities in aviation maintenance, airframe and powerplant systems, avionics, inspection, manufacturing, engineering, and airport operations.
ACI 5.3	Evaluate education, certification, training, and career pathway requirements for aviation-related occupations, including military, technical school, apprenticeship, and college options.
ACI 5.4	Analyze aviation industry workforce trends, employment opportunities, and career outlooks to develop an individualized career plan aligned with personal interests, skills, and professional goals.

Aviation Careers II - 20057	
ACII 1: Apply the principles of flight.	
ACII 1.1	Utilize the parts and control surfaces on an aircraft in flight. ● Examine the utilization of the airfoil. ● Examine the utilization of the wings. ● Examine the utilization of the tail. ● Examine the utilization of the propeller.
ACII 1.2	Utilize the four forces of flight. • Explore the concept of lift versus weight. • Explore the concept of thrust versus drag.
ACII 1.3	Utilize aerodynamics in flight. ● Apply Newton's Three Laws of Motion to flight. ● Explain the impact of the Bernoulli Effect on airfoil. ● Explain the impact of the Venturi Effect on propulsion. ● Compare Static versus Dynamic Pressure.
ACII 1.4	Implement airplane stability while in flight. ● Utilize the concept of pitch. ● Utilize the concept of roll. ● Utilize the concept of yaw.
ACII 2: Operating in a safe flight environment.	
ACII 2.1	Practice air safety. ● Practice air safety while being aware of common concerns. ● Practice night flying procedures. ● Demonstrate an understanding of the Federal Aviation Administration (FAA) regulations.
ACII 2.2	Implement proper procedures at the airport. ● Compare and contrast different types of airports. ● Examine causes of runway accidents. ● Implement proper take-off and landings at different types of airports. ● Create an example of a safe and effective airport layout.
ACII 2.3	Practice working in different airspaces. ● Create and complete a local and cross-country flight plan. ● Implement proper air-traffic control procedures.
ACII 2.4	Implementing proper radio communications. ● Implementing proper procedures of radio communications while conducting a flight. ● Implementing proper cockpit management of radio systems.
ACII 3: Utilizing aircraft systems and performance.	

ACII 3.1	Implement proper use of aircraft instruments. ● Utilize the six basic aircraft instruments (airspeed indicator, attitude indicator, altimeter, turn coordinator, heading indicator, and vertical speed indicator) in flight. ● Interpret the reading of each instrument to confirm an accurate 'instrument scan'.
ACII 3.2	Implement proper use of aircraft systems. ● Utilize the flight control systems (mechanical, hydromechanical and fly-by-wire) in flight. ● Assess the latest innovations in fly-by-wire flight control systems.
ACII 3.3	Evaluate and respond to aircraft performance during flight. ● Solve percentage problems (percent of power for turbine engines, flap position percent indicators). ● Solve ratio and proportion problems (compression ratios of an aircraft, glide ratios).
ACII 3.4	Calculate weight and balance. ● Compute empty weight center of gravity on an aircraft. ● Compute loaded weight and loaded weight center of gravity of an aircraft.
ACII 4: Utilize the relationships between weather and flight for safety.	
ACII 4.1	Apply basic weather theory to flights. ● Explain the composition of the Earth's atmosphere. ● Assess how temperature variation influences flight performance.
ACII 4.2	Describe weather patterns and clouds. ● Analyze pressure systems at different attitudes on a surface map. ● Identify the types of clouds (stratus, cumulonimbus, and cirrus) at different elevations and the potential hazards that may exist.
ACII 4.3	Assess weather hazards. ● Compare and contrast the common weather hazards when flying. ● Assess safe and corrective actions for common weather hazards as suggested by the Federal Aviation Administration (FAA).
ACII 4.4	Interpret weather data. ● Interpret current weather conditions using a weather map. ● Collect and analyze local weather data for flight.
ACII 4.5	Utilize sources of weather information. • Utilize various sources for weather information, which may include NOAA, NWS, METAR, ADDS.
ACII 5: Implement navigation in flight.	
ACII 5.1	Implement proper navigation skills. ● Demonstrate proper use of the essential navigational information a pilot needs to know (starting point, ending point, direction, distance, speed, fuel capacity, and weight and balance).

	● Implement Visual Flight Rules (VFR) while flying.
ACII 5.2	Utilize dead-reckoning and pilotage. ● Utilize dead-reckoning and pilotage while flying. ● Calculate a flight course using the elements of course line, airspeed, course heading and elapsed time.
ACII 5.3	Utilize a flight computer. ● Understand the basic concepts of a flight computer. ● Create and file a flight plan utilizing a flight computer.
ACII 5.4	Utilize aeronautical charts. ● Plot a course using an aeronautical chart. ● Evaluate flight plans for improved efficiency.
ACII 5.5	Utilize radio navigation. ● Distinguish between the types of Radio Navigation: Very High Frequency Omnidirectional Range (VOR), Distance Measuring Equipment (DME), Instrument Landing System (ILS), Global Positioning System (GPS), Inertial Navigations Systems (INS). ● Implement radio navigation while in flight.
ACII 6: Understand aviation physiology.	
ACII 6.1	Examine and understand the effect on the body in the flight environment. ● Assess the potential hazards on the body during flight for safety. ● List and describe the safety procedures to prevent aviation accidents due to physical distress.
ACII 7: Understanding Federal Aviation Administration (FAA) Regulations and Required Flight Paperwork	
ACII 7.1	Examine and understand the current FAA regulations for flight. ● Assess the regulations for safety. ● List and describe the current FAA regulations.
ACII 7.2	Utilize flight paperwork. ● File proper paperwork for flights. ● Tracking flight hours and keeping a proper logbook. ● Understand the application process for the Private Pilots Ground School Test.
ACII 8: Explore the multiple careers in aviation.	
ACII 8.1	Explore aviation and aerospace career pathways, including opportunities in aviation maintenance, airframe and powerplant systems, avionics, inspection, manufacturing, engineering, and airport operations.
ACII 8.2	Evaluate education, certification, training, and career pathway requirements for aviation-related occupations, including military, technical school, apprenticeship, and college options.

ACII 8.1	Analyze aviation industry workforce trends, employment opportunities, and career outlooks to develop an individualized career plan aligned with personal interests, skills, and professional goals.

Aviation Maintenance - 20056	
AM 1: Explore aviation maintenance foundations.	
AM 1.1	Explain the role of aviation maintenance technicians in ensuring aircraft safety and airworthiness.
AM 1.2	Identify major aircraft categories and classifications.
AM 1.3	Demonstrate proper aviation shop safety procedures.
AM 1.4	Identify common aviation maintenance tools and their appropriate use.
AM 1.5	Demonstrate proper care, inspection, and storage of tools and equipment.
AM 1.6	Demonstrate professionalism, teamwork, and ethical decision-making.
AM 2: Analyze aircraft drawings and documentation.	
AM 2.1	Interpret and apply aircraft drawings, blueprints, sketches, charts, graphs, and system schematics, including the lines, symbols, terminology, and conventions used in aviation maintenance documentation.
AM 2.2	Analyze aircraft systems and components using drawings, blueprints, and system schematics to inspect, repair, alter, and verify conformity with approved type design specifications.
AM 2.3	Assess and mitigate risks associated with interpreting aircraft drawings, including the proper application of tolerances, specifications, and design requirements for repairs and alterations.
AM 2.4	Evaluate the accuracy and applicability of aircraft drawings and schematics by verifying model and serial number compatibility, revision status, and use of the current approved documentation.
AM 2.5	Create and interpret aircraft sketches and drawings, including identifying lines, symbols, dimensions, and revisions used in aviation maintenance documentation.
AM 2.6	Analyze aircraft drawings to determine material requirements and support maintenance, repair, and alteration activities.
AM 2.7	Interpret and apply information presented in aviation-related graphs, charts, and technical documents to support maintenance decision-making.
AM 3: Apply weight and balance fundamentals.	
AM 3.1	Demonstrate an understanding of aviation weight and balance terminology, principles, and the importance of maintaining aircraft weight and center of gravity (CG) within approved limits.
AM 3.2	Explain the purpose, preparation, and procedures for accurately weighing an aircraft, including weighing area requirements and determining the proper empty weight configuration.
AM 3.3	Apply weight and balance calculations to determine arm, moment, moment index, and center of gravity, and evaluate their effects on aircraft operation and safety.
AM 3.4	Analyze aircraft loading conditions, including adverse loading scenarios and ballast placement, to determine compliance with approved weight and CG limitations.
AM 3.5	Demonstrate an understanding of aircraft jacking procedures and their relationship to safe weighing, maintenance, and weight-and-balance operations.

AM 3.6	Identify, assess, and mitigate risks associated with aircraft jacking, weighing procedures, and the proper use of weighing equipment to ensure safe and accurate weight-and-balance operations.
AM 3.7	Evaluate and mitigate risks related to aircraft loading by analyzing the aerodynamic and performance effects of center of gravity positions outside approved limits and aircraft weights exceeding operational limitations.
AM 3.8	Apply aircraft weighing procedures by locating and interpreting weight-and-balance information, identifying datum and tare items, verifying scale calibration, and determining aircraft empty weight and center of gravity (CG).
AM 3.9	Perform weight-and-balance calculations, including moments, CG location, forward and aft CG limits, ballast requirements, weight shifts, equipment changes, and corrective actions for out-of-balance conditions.
AM 3.10	Determine aircraft loading limitations and CG ranges using aircraft specifications, Type Certificate Data Sheets (TCDSs), equipment lists, placards, and approved weight-and-balance documentation.
AM 3.11	Analyze the effects of equipment installation or removal by calculating weight changes, revising aircraft equipment lists, and updating weight-and-balance data to maintain regulatory compliance.
AM 3.12	Document weight-and-balance changes by creating and completing required maintenance records and supporting documentation in accordance with aviation maintenance standards and procedures.
AM 4: Explore regulations, maintenance forms, records, and publications.	
AM 4.1	Demonstrate an understanding of mechanic certificate privileges, limitations, recent experience requirements, and professional responsibilities, including procedures for re-establishing eligibility and maintaining Federal Aviation Administration (FAA) records.
AM 4.2	Explain aviation maintenance regulations, terminology, and the regulatory framework governing aircraft maintenance, inspections, repairs, alterations, and return-to-service approvals.
AM 4.3	Interpret and apply maintenance documentation requirements, including maintenance record entries, discrepancy records, placards, and Federal Aviation Administration (FAA) forms used to document inspections, repairs, alterations, and airworthiness status.
AM 4.4	Utilize Federal Aviation Administration (FAA) publications, databases, approved maintenance data, and regulatory resources, including Type Certification Data Sheet (TCDS), supplemental type certificates, advisory circulars, airworthiness directives, and Alternative Methods of Compliance (AMOCs).
AM 4.5	Interpret manufacturer maintenance information, including maintenance manuals, service bulletins, maintenance alerts, equipment lists, maintenance intervals, inspection requirements, and prescribed methods, techniques, and practices.
AM 4.6	Differentiate between approved and acceptable maintenance data, determine the applicability of airworthiness limitations, and evaluate compliance requirements for repairs, alterations, inspections, and continued airworthiness.
AM 4.7	Interpret aircraft and component applicability information, including effectivity codes, serial number applicability, inoperative equipment procedures, and maintenance manual

	alerts, cautions, warnings, and notes to ensure proper maintenance actions and regulatory compliance.
AM 4.8	Identify, assess, and mitigate risks associated with maintenance documentation by ensuring the completeness, accuracy, and proper execution of records, while avoiding complacency during documentation and return-to-service procedures.
AM 4.9	Evaluate and mitigate risks related to maintenance safety and compliance by properly using Safety Data Sheets (SDS), adhering to warnings, cautions, and notes in maintenance documentation, and verifying component applicability to specific aircraft and configurations.
AM 4.10	Prepare, review, and complete aviation maintenance documentation, including FAA Form 337, return-to-service entries, airworthiness directive (AD) compliance records, and 100-hour inspection maintenance record entries.
AM 4.11	Analyze aircraft maintenance records, inspection documentation, and regulatory requirements to determine inspection status, airworthiness compliance, and required maintenance actions.
AM 4.12	Locate, interpret, and apply FAA and manufacturer-approved resources, including aircraft specifications, Type Certificate Data Sheets (TCDSs), supplemental type certificates (STCs), illustrated parts catalogs (IPCs), and applicable maintenance data.
AM 4.13	Evaluate repairs, alterations, and maintenance actions by determining whether they are major or minor, identifying applicable approved or acceptable data, and verifying regulatory compliance.
AM 4.14	Verify aircraft configuration and component conformity by comparing installed equipment to approved equipment lists, determining approved replacement parts, confirming TSO or manufacturing authorization markings, and evaluating placards, instrument markings, and operating limitations.
AM 4.15	Determine the applicability of airworthiness directives, replacement parts, aircraft specifications, and maintenance data, including identifying maximum allowable aircraft weight and ensuring compliance with approved aircraft configurations.
AM 4.16	Demonstrate an understanding of FAA14 CFR 43.9 is the federal regulation that outlines the mandatory requirements for recording aircraft maintenance, preventive maintenance, rebuilding, or alteration.
AM 4.17	Demonstrate an understanding of FAA 43.11 (officially *14 CFR § 43.11*) is the Federal Aviation Regulation that dictates how aviation mechanics and inspectors must document and certify inspections.
AM 4.18	Demonstrate an understanding of FAA Regulations 43 Appendices A-F.
AM 5: Evaluate the impact of human factors on aviation maintenance.	
AM 5.1	Demonstrate an understanding of safety culture, organizational influences, and environmental factors that affect human performance, decision-making, and operational safety in aviation maintenance.
AM 5.2	Analyze human factors, including human performance limitations, conditions that contribute to unsafe acts, and the types and causes of human error that impact maintenance operations.

AM 5.3	Apply effective communication, hazard reporting, shift and task turnover procedures, teamwork, and leadership practices to promote safe and efficient maintenance environments.
AM 5.4	Demonstrate professionalism, integrity, and the ability to participate in event investigations to identify causes, communicate findings, and support continuous safety improvement.
AM 5.5	Identify, assess, and mitigate risks associated with safety reporting by recognizing the importance of accurate hazard reporting, avoiding selective reporting practices, and promoting a proactive safety culture.
AM 5.6	Evaluate and manage risks related to human performance and aircraft maintenance reliability by applying fatigue management practices, determining fitness for duty, and utilizing non-invasive condition-monitoring technologies.
AM 5.7	Complete and communicate aviation maintenance safety documentation, including malfunction or defect reports and shift turnover briefings, to ensure accurate information transfer and continuity of maintenance operations.
AM 5.8	Locate, interpret, and apply human factors information to recognize, analyze, and mitigate errors that may impact aviation maintenance safety and performance.
AM 6: Explore the multiple careers in aviation.	
AM 6.1	Explore aviation and aerospace career pathways, including opportunities in aviation maintenance, airframe and powerplant systems, avionics, inspection, manufacturing, engineering, and airport operations.
AM 6.2	Evaluate education, certification, training, and career pathway requirements for aviation-related occupations, including military, technical school, apprenticeship, and college options.
AM 6.3	Analyze aviation industry workforce trends, employment opportunities, and career outlooks to develop an individualized career plan aligned with personal interests, skills, and professional goals.

Emerging Transportation Technologies - 20119	
ETT 1: Students will analyze the evolution of transportation technologies and their impact on society and the global economy.	
ETT 1.1	Identify major innovations in transportation history.
ETT 1.2	Describe why new technology is needed for modern transportation systems.
ETT 1.3	Compare traditional transportation systems with emerging technologies.
ETT 1.4	Examine the role of innovation in improving efficiency, safety, and sustainability.
ETT 1.5	Investigate real-world transportation challenges.
ETT 2: Apply knowledge of emerging transportation technologies.	
ETT 2.1	Explore the integration of computer science with emerging transportation technologies (e.g. Controller Area Network (CAN) bus networks, ethernet networks, IP address configuration).
ETT 3: Examine how Global Navigation Satellite Systems (GNSS), including Global Positioning System (GPS), are used to support modern transportation technologies and industry operations.	
ETT 3.1	Describe how GNNS systems operate, including satellites, receivers, and signal transmission.
ETT 3.2	Explain how GNSS technology is used in ground transportation, supply chain and logistics, aviation, and maritime navigation.
ETT 3.3	Investigate the role of GNNS in emerging technologies such as autonomous vehicles, drones, and precision agriculture.
ETT 3.4	Identify factors that affect positioning accuracy and reliability, including signal interference and environmental conditions.
ETT 4: Explore the components, operation, and advantages of electric and hybrid vehicles.	
ETT 4.1	Identify major components of electric and hybrid vehicles (battery systems, motors, controllers).
ETT 4.2	Explain how electric and hybrid propulsion systems operate.
ETT 4.3	Compare internal combustion, hybrid, and electric vehicle technologies.
ETT 4.4	Investigate environmental and economic impacts of electric vehicle adoption.
ETT 5: Analyze the infrastructure needed to support electric transportation systems.	
ETT 5.1	Describe electric vehicle charging systems and infrastructure.
ETT 5.2	Explain how energy production and storage affect transportation systems.
ETT 5.3	Examine challenges associated with implementing new transportation technologies.
ETT 6: Examine the technologies that enable autonomous and connected vehicles.	
ETT 6.1	Identify sensors and technologies used in autonomous vehicles (LiDAR, radar, cameras, GNSS, Inertial Measurement Unit (IMU)).
ETT 6.2	Describe levels of vehicle automation.
ETT 6.3	Explore vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication.
ETT 6.4	Evaluate safety, ethical, and regulatory considerations of autonomous transportation.
ETT 7: Investigate the uses, technologies, and regulations of unmanned aerial systems (drones).	
ETT 7.1	Identify key components of unmanned aerial systems.
ETT 7.2	Describe common personal, commercial, and industrial uses of drones.
ETT 7.3	Demonstrate basic drone operation concepts and safety practices.
ETT 7.4	Examine regulations governing drone use.

ETT 8: Explore how emerging transportation technologies are transforming various industries.	
ETT 8.1	Investigate how autonomous and precision technologies impact agriculture.
ETT 8.2	Examine the role of automation in mining and heavy equipment operations.
ETT 8.3	Explore innovations in logistics, delivery, and supply chain transportation.
ETT 8.4	Explore innovations in mass transportation systems.
ETT 8.5	Analyze how emerging technologies improve efficiency and safety across industries.
ETT 9: Evaluate safety, ethical, and environmental considerations related to transportation innovation.	
ETT 9.1	Analyze safety concerns and benefits related to emerging transportation technologies.
ETT 9.2	Discuss regulatory frameworks and industry standards.
ETT 9.3	Identify cybersecurity risks in equipment in a digital world.
ETT 10: Explore emerging, specialized, and lesser-known career pathways related to advanced transportation technologies.	
ETT 10. 1	Identify emerging and specialized careers in areas such as autonomous systems, electric vehicle technology, drone operations, navigation systems, and advanced mobility engineering.
ETT 10. 2	Describe education, training, and technical skill requirements for careers in emerging transportation technology fields.

Cross Cluster Standards also connected with the Supply Chain and Transportation Cluster	
Primary Cluster	**Course**
Manufacturing	Introduction to Technical Skills and Application - 21051