Regional Occupational Program

Welding Technology A-G 2026-2027

COURSE DESCRIPTION

This course introduces students to various welding techniques, shop safety, and the design process. Students will receive both classroom and practical instruction in wire-fed processes (GMAW/MIG), shielded metal arc welding (SMAW), oxy-acetylene welding (OAW), gas tungsten arc welding (GTAW/TIG), and cutting methods. Students who demonstrate competency in this course are prepared to seek entry-level employment, enroll in the second high school course to earn certification, or continue their training at a postsecondary institution. Students will engage in technical documentation, design-based problem solving, and analysis of welding processes aligned to industry standards.

Course Information

Course Length:	1 Year
Prerequisite:	None
Course Level:	Concentrator
UC:	Yes G - Elective
Articulated:	No
Industry Cert.:	No
Industry Sector:	Manufacturing and Product Development
Pathway:	Welding and Materials Joining
CALPADS:	8230

O*Net SOC Codes

51-4121	Welders, Cutters, Solderers, and Brazers

Legend

CTE - PS	CTE Pathway Standards
CRP	Career Ready Practices
CTE - AS	CTE Anchor Standards
CCSS	Common Core State Standards
ISTE	International Society for Technology in Education

Includes updates from 25/26 Manufacturing Advisory

Advisory Minutes

Welding Technology

Course Orientation

a. Discuss objectives for this course, including competencies, teacher expectations, classroom policies, and procedures.
b. Identify and discuss the acquisition of transferable skills (communication, collaboration, creativity, and critical thinking) and their importance to being college and career ready and for future personal and professional success.
c. Review objectives, competencies, and course syllabus.
d. Discuss student and teacher expectations, including behavior, class rules, appropriate dress, pre-course knowledge, and grading policies, including enrollment and attendance requirements and procedures, and classroom/school safety and disaster procedures.
e. Discuss next steps in course sequence related to the career pathway, the need for reinforcement of basic skills, transferrable skills, and postsecondary and career options.
f. Discuss the Big Six: Career Ready Essentials and the Standards for Career Ready Practice as they relate to this course, all aspects of the industry sector, and being college and career ready.

Big Six: Career Ready Essentials

1. Effective Communication	CTE – PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate effective verbal communication and conflict resolution skills. **b. Use the writing process to develop written communication with the appropriate tone, organization, and format for the identified audience.** c. Explain the effect of interpersonal skills on one's ability to communicate effectively and develop relationships. d. Describe the impact of ineffective communication on business relationships. e. Analyze the impact of vocabulary, body language, and tone on verbal communication. f. Demonstrate active listening skills. g. Accurately interpret industry-specific written communication. h. Model responsible and effective use of various communication technologies. i. Identify valid and reliable digital reference and resource materials. j. Gather information from multiple digital sources to compare and contrast, synthesize, and summarize. k. Identify and use appropriate communication and collaboration technologies. l. Utilize technology to problem solve, accomplish tasks, and to produce or publish products.		1 2 11	2 3 4 5 7 8 9 10 11	**LS** 9-10 11-12.6 **SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.7 11-12.6	1b,c 2c 3b,c 5c 6b,c,d

2. Collaboration, Creativity, and Critical Thinking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate critical thinking skills for a variety of purposes and in different settings. **b. Collaborate to reach consensus on an identical objective through the sharing of knowledge, tasks, and learning.** c. Discuss the importance of the critical thinking process to real-world applications.		2 4 5 7	2 3 4 5	**LS** 9-10 11- 12.6	1c 3c,d 4a-d 5c,d

d. Evaluate the impact of creative thinking on problem solving and innovation in real-world applications. e. Compile work that demonstrates the process used to (elaborate, refine, analyze) evaluate original ideas and maximize creative efforts. f. Apply divergent and convergent thinking to the development of an original idea or solution. g. Examine real-world limits to adopting ideas. h. Demonstrate creative thinking (preparation, insight, evaluation, elaboration, and communication) to create a new idea or concept. i. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member. j. Evaluate evidence, arguments, claims, and beliefs to identify connections. k. Identify bias, prejudice, propaganda, self-deception, distortion, and misinformation. l. Produce intellectual, informational, or material products that serve an authentic purpose. m. Work effectively and respectfully with those from diverse backgrounds or cultures. n. Demonstrate respect, trust, commitment, and the ability to compromise in collaborative projects.		9 10 11	7 8 9 11	**SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.7 11-12.6	6c 7b,c,d
3. Leaders and Teams: Roles and Responsibilities	**CTE – PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Determine the individual and team members' roles and responsibilities. **b. Demonstrate leadership skills and qualities (i.e., reliability, negotiation skills, initiative, positive reinforcement, recognition of others' efforts, problem-solving skills, conflict resolution, and delegation).** c. Explain the importance of technical, social, and communication skills to team success. d. Compare and contrast leadership styles and their effectiveness in various situations. e. Organize and delegate responsibilities in a team setting to encourage ideas, perspectives, and contributions from all team members. f. Develop a strong sense of team identity by brainstorming solutions, volunteering, assisting others, practicing respect and courtesy, and taking initiative. g. Examine situations in which a follower becomes the leader. h. Describe twenty-first-century skills required across all occupations. i. Identify and discuss the characteristics of a successful team (i.e., leadership, cooperation, and effective decision-making). j. Leverage social and cultural differences to increase innovation and quality of work.		7 8 9	3 7 8 9 11	**SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.6	7a,c
4. Legal, Ethical, and Environmental Considerations	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate industry specific ethical and legal practices. **b. Identify eco-friendly industry specific practices and resources.** c. Identify local, state, and federal regulatory agencies, entities, laws, and regulations.		5 7 8	3 5 7	**WS** 11-12.6 11-12.7	2a,b 3a,b 5c

d. Identify discrimination based on race, nationality, religion, gender, age, disability, or sexual orientation. e. Summarize the ethical and legal implications of workplace discrimination and harassment. f. Explain the concept of corporate citizenship. g. Examine an employer's role in protecting the health and welfare of employees, the community, and the environment. h. Analyze current environmental laws and regulations and their impact on industry. i. Compare and contrast both society's and industry's impact on the environment.		12	8 9 11	**SLS** 9-10 11-12.1 11-12.1d 11-12.2	6c
5. Personal Growth and Career Planning	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate continued personal development and growth. **b. Develop and manage a personal growth and career plan.** c. Explain the relationship between sound financial habits and financial security. d. Create and manage a personal financial plan. e. Demonstrate initiative in achieving personal and professional goals. f. Apply time management strategies to meet deadlines. g. Demonstrate a growth mindset through flexibility and a positive attitude. h. Select and demonstrate appropriate job-search and retention techniques. i. Demonstrate strategies to prepare for employment. j. Demonstrate interpersonal skills appropriate for the workplace. k. Elaborate on the importance of perseverance to personal and professional success. l. Discover personal career interests, aptitudes, and skills.		1 2 3 4 6	2 3 4 7 8 11	**LS** 9-10 11-12.6 **SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.6	1a 3a,c 4d 6a,d 7b
6. Workplace Safety and Personal Wellness	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate proper industry specific safe work practices to prevent injury or illness. **b. Assess the potential impact of goal setting on personal and professional success.** c. Describe the role of security and emergency procedures in workplace safety. d. Describe the effect of preventative measures on emergencies in the workplace. e. Identify and describe the causes, prevention, and treatment of common accidents. f. Identify local, state, and federal agencies that regulate workplace safety. g. Explain the role of the California Occupational Safety and Health Administration (Cal-OSHA) and the Environmental Protection Agency (EPA). h. Discuss the basics of system operations. i. Demonstrate the proper use of personal protective equipment (PPE). j. Explain the purpose of and accurately interpret a Safety Data Sheet (SDS). k. Identify hazardous materials and chemicals. l. Demonstrate proper procedures to respond to work-related accidents and injuries. m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries.		2 5 6 8 12	2 5 6 7 8 10 11	**LS** 9-10 11-12.6 **WS** 11-12.7 11-12.6 **SLS** 9-10 11-12.1 11-12.1d	1a,d 2a,d 5b

n. Demonstrate cyber ethics, cyber safety, and cybersecurity. o. Assess the potential impact of preventative physical and mental health measures on workplace safety.					
Welding Technology Units of Instruction					
7. Shop Safety	**CTE-PS**	**CRP**	**CTE- AS**	**CCSS**	**ISTE**
a. Describe and demonstrate proper welding shop safety. b. Critique and utilize general shop safety. c. Discuss and practice proper oxygen-acetylene welding and cutting safety. d. Describe and demonstrate proper GMAW (MIG) welding safety. e. Evaluate and demonstrate proper GTAW (TIG) welding safety. f. Describe and practice proper shield metal arc welding (SMAW) safety. g. Assess and demonstrate proper fire control and fire safety.		1 2 5 7 8 11	1 2 5 7 8 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **SLS** 9-10 11-12.1 11-12.1d	
8. Oxy-Acetylene Welding (OAW)	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Describe and demonstrate procedures used in OAW. b. Identify and model proper oxygen-acetylene welding and cutting safety. c. Review, practice, and demonstrate basic techniques using OAW. d. Describe, review, practice, and demonstrate brazing techniques.	C2.0	1 2 5 8 10 11	1 2 5 8 11	**LS** 9-10 11-12.6 **SLS** 11-12.1d **WS** 11-12.7	
9. Gas Metal Arc Welding (GMAW/MIG)	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Describe and demonstrate procedures used in Gas Metal Arc Welding (GMAW/MIG). b. Evaluate and model proper GMAW (MIG) welding safety. c. Identify the principles of and set-up for Gas Metal Arc Welding (GMAW/MIG). d. Describe, review, practice, and demonstrate basic joints using MIG welding. e. Review, practice and demonstrate spray, globular, and short-arc techniques.	C2.0 C2.1	1 2 5 8 10 11	1 2 5 8 11	**LS** 9-10 11-12.6 **SLS** 11-12.1d **WS** 11-12.7	
10. Gas Tungsten Arc Welding (GTAW/TIG)	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Describe and demonstrate procedures used in Gas Tungsten Arc Welding (GTAW/TIG).** b. Describe and demonstrate proper GTAW (TIG) welding safety.	C2.0 C2.3	1 2	1 2	**LS** 9-10	

c. Utilize the principles of and set-up for GTAW (TIG) welding. d. Review, practice and demonstrate basic joints using GTAW (TIG) welding. e. Contrast, review, practice, and demonstrate welding aluminum, magnesium, stainless steel, cast iron, and steel using GTAW (TIG).		5 8 10 11	5 8 11	11-12.6 **SLS** 11-12.1d **WS** 11-12.7	
11. Wire-Fed Arc Welding Processes	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate competency in additional wire-fed welding processes (e.g., GMAW/FCAW). b. Interpret principles and set-up for wire-fed welding processes. c. Review, practice, and demonstrate metal preparation for wire-fed welding processes. d. Evaluate, review, practice, and demonstrate tacking techniques using wire-fed welding processes. e. Describe, review, document, and demonstrate flaw identification and repair.	C2.0	1 2 5 8 10 11	1 2 5 8 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **SLS** 11-12.1d	
12. Shielded Metal Arc Welding (SMAW)	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Describe and demonstrate procedures used in SMAW.** b. Define and demonstrate proper SMAW safety. c. Identify the principles of and set-up for SMAW. d. Review, practice and demonstrate basic welding applications involved using SMAW. e. Assess, review, practice, and demonstrate tacking, running bead and weaves using SMAW f. Evaluate, review, practice, and demonstrate position and out-of-position using SMAW g. Describe, review, practice, and demonstrate welding common metals using SMAW. h. Recognize, review, practice, and demonstrate welding in advanced positions using SMAW. i. Review, practice, and demonstrate welding joints using SMAW.	C2.0	1 2 5 7 8 10 11	1 2 5 7 8 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **SLS** 9-10, 11-12.1 11-12.1d	
13. Cutting Methods	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Describe how the effects of heat, metal thickness and metal length influence welding techniques. b. Model and practice appropriate flame cutting procedures. c. Describe review, practice, and demonstrate plasma arc cutting. d. Decide how metal length and thickness affect welding techniques.	C2.2	1 2 5 8 10 11	1 2 5 8 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **SLS** 11-12.1d	

14. Effects of Heat	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. **Describe how the effects of heat, metal thickness, and metal length influences welding techniques.** b. Identify how the metal length and thickness affect welding techniques. c. Describe and demonstrate the effects of heat and how that can lead to distortion. d. Define a heat affected zone.		1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
15. Project Design	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Demonstrate the ability to complete a project design.** b. Discuss and demonstrate how to draw and interpret plans using industry-standard symbols. c. Identify the process used to determine the proper material for a project. d. Select the appropriate material for a given project. e. Provide a layout of a given project. f. Calculate and justify material costs for a given project. g. Prepare an accurate invoice for services.	1.2	1 2 5 8 10 11	1 2 5 8 10 11	**LS** 9-10 11-12.6 **WS** 11-12.7 **SLS** 11-12.1d	

A-G Approved Key Assignments	
1.	Students will work in groups of 2-3 to create a poster diagramming and outlining key components of workshop safety. Students present their posters to other groups, and groups will then evaluate each other's posters, content, and presentation quality. *Unit(s) 7*
2.	Students must pass a written safety assessment with a 90% accuracy prior to utilizing equipment and/or working in the shop area. *Unit(s) 7*
3.	Demonstrate procedures to properly and safely light an oxygen/acetylene torch and adjust the flame to obtain a neutral flame and then a feathered flame. Then perform skill-building practice cuts on 1/4' thick mild steel plates. As a performance task, students will then cut out a 5"x5" dimensioned test plate with various features. *Unit(s) 8* Students will be assessed on: • Demonstration of proper set up procedures • Flame adjustments • Quality of cuts, edges, and dimensions
4.	Students will practice technical writing by writing an electronic instruction manual or guide on how to use a piece of welding gear safely. Students will explain welding vernacular in terms easy to understand by 8th grade visitors that know nothing about welding and are interested in learning more about the Welding pathway. Students will utilize technical resources by posting the manual online, contributing to an online resource library. *Unit(s) 9*
5.	Students will demonstrate proper set-up for MIG welding, demonstrate basic joints, and techniques such as, spray, globular, and short arc. *Unit(s) 9*
6.	Demonstrate proper TIG set-up, safety procedures, PPE usage and weld a variety of metals (aluminum, magnesium, stainless steel, cast iron, and steel) to create basic joints. *Unit(s) 10*
7.	Students will complete three individual weldment procedures in the flat and horizontal position. Each one will focus on one of the three different wire feed processes. These weld samples will include butt, lap, T, and corner weld joint types in the flat and horizontal positions to increase each student's hands-on skill level. Each lab completion has a written lab report documenting procedures, accuracy, and evaluation of weld quality. *Unit(s) 11*
8.	Demonstrate the proper set-up for shielded metal arc welding and don the proper PPE. Students will then demonstrate tacking, running bead, weaves, and joints, using in and out-of-position. Students will be evaluated using a rubric for each component of the demonstration. *Unit(s) 12*
9.	Students will be given a piece of metal and will be asked to predict and explain what the effects of several different cutting methods would have on the given piece of metal. *Unit(s) 13*
10.	Students will demonstrate the cutting methods on the piece of metal and record what the effects were and if their predictions were accurate. *Unit(s) 13*
11.	Write a 2-page research paper on the effects of heat from the welding process on 3 different types of metal. Include how variations in the length, and thickness of metals determine the effect and suggest welding techniques to reduce these effects. U*nit(s) 14*
12.	Students will design and create a small project of their own choosing. Before beginning construction on the project, the students must submit a complete set of plans detailing the dimensions of the project, AWS recognized symbols indicating the types of welds to be used, type and amount of materials, and the dimensions and measurements for all cuts or bends that need to be made. Once approved students will build their project and prepare an invoice for the cost of materials and services. *Unit(s) 15*

Standards Alignment

The curricula have been aligned with the CTE Model Curriculum Standards released in 2013. Each industry sector was updated to meet the increased rigor and relevancy requirements of the Common Core State Standards. The curriculum also includes the new Standards for Career Ready Practices.

Standards for Career Ready Practice

1. *Apply appropriate technical skills and academic knowledge.*
2. *Communicate clearly, effectively, and with reason.*
3. *Develop an education and career plan aligned with personal goals.*
4. *Apply technology to enhance productivity.*
5. *Utilize critical thinking to make sense of problems and persevere in solving them.*
6. *Practice personal health and understand financial literacy.*
7. *Act as a responsible citizen in the workplace and the community.*
8. *Model integrity, ethical leadership, and effective management.*
9. *Work productively in teams while integrating cultural and global competence.*
10. *Demonstrate creativity and innovation.*
11. *Employ valid and reliable research strategies.*
12. *Understand the environmental, social, and economic impacts of decisions.*

CTE Anchor Standards—Common Core English Language Arts Alignment

Anchor Standard 1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector.

Anchor Standard 2: Communications

Language Standard: Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6

Anchor Standard 3: Career Planning and Management

Speaking and Listening Standard: Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2

Anchor Standard 4: Technology

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information.

Anchor Standard 5: Problem Solving and Critical Thinking

Writing Standard: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow, or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7

Anchor Standard 6: Health and Safety

Reading Standards for Science and Technical Subjects: Determine the meaning of symbols, keywords, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10, 11-12.4

Anchor Standard 7: Responsibility and Flexibility

Speaking and Listening Standard: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10, 11-12.1

Anchor Standard 8: Ethics and Legal Responsibilities

Speaking and Listening Standard: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-2.1d

Anchor Standard 9: Leadership and Teamwork

Speaking and Listening Standard: Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b

Anchor Standard 10: Technical Knowledge and Skills

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6

Anchor Standard 11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in the classroom, laboratory, and workplace settings, and the career technical student organization. Note: no alignment evident for this standard. WS 11-12.6

Manufacturing and Product Development

C. Welding and Materials Joining Pathway

C2.0 *Understand and demonstrate how materials can be processed through the use of welding tools and equipment.*

C2.1 *Introduce joint preparation methods and explain how to identify joint specifications.*

C2.2 *Use standard and new emerging welding tools and equipment, such as oxygen fuel cutting (OFC), plasma arc cutting (PAC), and carbon arc cutting (CAC) to cut materials for the purpose of completing a finished product that meets the standards of the AWS or a similar industry standard.*

C2.3 *Use welding tools and equipment such as oxy fuel welding (OFW), shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux-cored arc welding (FCAW), gas tungsten arc welding (GTAW), forge, and furnace to combine or join manufactured parts and products resulting in a finished product that meets the standards of the AWS or a similar industry standard.*

ISTE Standards for Students

1. Empowered Learner- Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

a) Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.

b) Students build networks and customize their learning environments in ways that support the learning process.

c) Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways

d) Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen- Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.

a) Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

b) Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.

c) Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

d) Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

3. Knowledge Constructor- Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

a) Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

b) Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.

c) Students curate *information from digital resources using a* variety of tools *and methods to create* collections of artifacts *that demonstrate* meaningful connections or conclusions.

d) Students build knowledge *by actively* exploring *real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.*

4. Innovative Designer- Students use a variety of technologies within a design process to identify and solve problems creating new, useful, or imaginative solutions.

a) Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

b) Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

c) Students develop, test, and refine prototypes as part of a cyclical design process.

d) Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

5. Computational Thinker- Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

a) Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.

b) Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

c) Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

d) Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator- Students communicate clearly and express themselves creatively for a variety of purposes using platforms, tools, styles, formats, and digital media appropriate for their goals.

a) Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

b) Students create original works or responsibly repurpose or remix digital resources into new creations.

c) Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.

d) Students publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator- Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

a) Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b) Students use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.

c) Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

d) Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.