Regional Occupational Program

Landscape Construction 2025-2026

COURSE DESCRIPTION

This course gives students a practical understanding of the landscape construction industry. Instruction and practical experience in the areas of landscape construction operations, landscape, and hardscape design concepts, including planning, installation, and construction; techniques for landscape maintenance; plant propagation; soil requirements, amendments, and preparation; basic irrigation; use of equipment, tools and safety. This course is designed for students interested in pursuing employment in landscape design, construction, and maintenance industries and horticulture careers.

Course Information

Course Length:	1 Year
Prerequisite:	None
Course Level:	Introductory
UC:	No
Articulated:	No
Industry Cert.:	No
Industry Sector:	Construction Trades
Pathway:	Residential & Commercial Construction
CALPADS:	7340

O*Net SOC Codes

37-3011	Landscaping and Groundskeeping Workers
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation

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 the 24/25 Construction Advisory

Advisory Minutes

Landscape Construction

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.**		2 4 5	2 3 4	**LS** 9-10 11- 12.6	1c 3c,d 4a-d

c. Discuss the importance of the critical thinking process to real-world applications. 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.		7 9 10 11	5 7 8 9 11	**SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.7 11-12.6	5c,d 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.**		5 7	3 5	**WS** 11-12.6	2a,b 3a,b

c. Identify local, state, and federal regulatory agencies, entities, laws, and regulations. 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.		8 12	7 8 9 11	11-12.7 **SLS** 9-10 11-12.1 11-12.1d 11-12.2	5c 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.		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

m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries. n. Demonstrate cyber ethics, cyber safety, and cybersecurity. o. Assess the potential impact of preventative physical and mental health measures on workplace safety.					
Landscape Construction Units of Instruction					
7. Tools and Equipment	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate proper selection and safe and proper use of tools or equipment for use in performance of common landscaping duties. b. Identify and describe hand and power tools commonly used in the landscape construction industry (i.e., pneumatic, electrical, gasoline or diesel engine driven, and cordless tools). c. Compare 2-cycle, 4-cycle, and diesel power equipment, operate, and maintain equipment to assure safety and performance. d. Identify and describe the proper care, maintenance, storage, and transportation of hand and power tools.		1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	
8. Plant Science	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Investigate and develop an understanding of growth and development of plants, including functions of plant parts and reproductive systems. a. Determine plant identification practices for annuals, perennials, shrubs, and various types of ground covering plants. b. Know the parts of a typical plant system and describe functions of each part. c. Describe processes of plant growth such as transpiration, transport systems, photosynthesis, and respiration. d. Classify typical plants according to their life cycle. e. Compare relationships and functions among seeds, roots, stems, leaves, flowers, and fruits. f. Assess plant growth requirements such as carbon dioxide, water, light, and nutrients and discuss the effects of the lack of any one of these elements. g. Understand the reproductive system of a typical plant such as pollination and fertilization; differentiate sexual/asexual plant reproduction. h. Contrast genetics and hybridization and explain why they are important to agriculture. i. Describe plant propagation including budding, grafting, cuttings, and seeds. j. Identify the common symptoms of stressed and diseased plants and recommend appropriate preventions and treatments. k. Explain the steps for the healthy plant maintenance. l. Categorize specific water, light, nutrient, and soil requirements for different plants.		1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

9. Soil Science and Fertilizers	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Summarize role of soil in plant production. Include factors that affect soil. Effectively manage and conserve soil. Develop awareness of USDA. b. Explain role of the major components of typical soils. c. Identify and explain the major factors in basic soil fertilization. d. Describe the characteristics of nitrogen, phosphorous and potassium in the soil. e. Explain how the soil affects plant growth. f. Recognize and identify soil conditions and discuss USDA soil-rating procedures. g. Properly blend and measure soil components. h. Practice proper procedures for adding fertilizer to soil.		1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

10. Landscape Design, Construction, & Maintenance	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Utilizing proper procedures, plant and maintain interior and exterior trees and shrubs. b. Determine proper procedures, then plant and care for trees and flowering shrubs. c. Determine proper procedures, then plant and care for perennial and annual plants. d. Identify and discuss environmental effects of weather on plants and scrubs. e. Determine and utilize proper procedures for transplantation of assorted plants.		1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

11. Landscape Construction Measurement and Layout	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate proper measurement techniques and mathematical calculations used in landscape construction. b. Calculate the areas and perimeters of geometric shapes. c. Calculate linear and square footage requirements for various materials commonly used in the landscape construction industry. d. Discuss and identify various grades in lumber commonly used in the landscape construction industry. e. Develop and demonstrate pattern construction. f. Defend and demonstrate material conservation; discuss ways to mitigate material waste. g. Identify and describe standard architectural and electrical symbols. h. Demonstrate proper blueprint reading skills. i. Describe site layout and excavation techniques.	D2.0 D2.1 D2.2 D2.3 D3.0 D3.1 D3.3 D3.4	1 2 5 10 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

12. Irrigation, Design, Construction & Maintenance	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Develop a working knowledge of water management practices including irrigation system designs, water conservation, and current legal issues. b. Discuss management of irrigation design, materials, equipment, and layouts. c. Compare and contrast the consequences of good and poor watering habits. d. Identify areas and essential times to water plants in gardens, greenhouses, homes, and plants in shade or sun.	D10.1 D10.3	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

e. Examine and demonstrate assorted methods to install irrigation systems. f. Define the terms “pressure check” and “systems check”. Discuss their relationship to an irrigation system installation.					
13. Mathematics for Landscape Construction	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Utilize math applications common in the landscape construction industry. b. Identify and apply record keeping procedures. c. Calculate the sales tax on several items. d. Complete invoices using standard industry abbreviations. e. Prepare and calculate cost estimates for given projects. f. Compare and evaluate gross sales and net sales. g. Complete a profit and loss statement; discuss outcomes related to business growth.	D2.0 D2.3	1 2 4 5 6 7 11	1 2 4 5 6 7 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11.12.7 **RSTS** 9-10 11-12.4 **SLS** 9-10 11-12.1	
14. Estimating Landscape Construction Costs	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate competency in estimating construction and landscaping costs, including materials and labor including shipping, sales tax, and delivery cost. b. Identify and discuss pertinent labor laws and regulations that pertain to the landscape construction industry. c. Describe when a building permit is required and the process for obtaining a permit; discuss how inspections relate to the landscape construction process. d. Identify and describe consumer protection relating to the landscape construction industry.	D1.0 D1.2 D2.0 D3.7	1 2 5 6 7 11	1 2 5 6 7 11	**LS** 9-10 11-12.6 **WS** 11.12.7 **RSTS** 9-10 11-12.4 **SLS** 9-10 11-12.1	
15. Building Materials	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in the selection and use of various materials used in the landscape construction industry. b. Compare and classify various building and landscape materials such as wood, concrete, masonry, stone, rock, etc.	D2.3 D4.7 D8.0 D8.1	1 2 5 11	1 2 5 11	**LS** 9-10 11-12.6	

c. Identify and discuss building code restrictions that apply to the landscape construction industry. d. Identify and discuss the safe cutting techniques for materials typically used in the landscape construction industry. e. Discuss proper moving and storage of materials.	D10.1			**WS** 11-12.7	
16. Construction of Garden Structures	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate knowledge and basic skills in design and construction of garden structures (i.e., gazebos, verandas, storage buildings, decks) b. Describe preparations for foundations for a specified garden structure. c. Assess the construction of a range of different existing landscape features, including tubs, arches, walls, and gates. d. Compare and contrast hard and soft woods and their specific benefits for use in building garden structures. e. Identify the major considerations when planning and building a deck. f. Classify various types of fencing and discuss the materials, the building process, and benefits of each. g. Discuss the various types of greenhouses and shade houses- types, construction, installation. h. Plan the construction of different landscape structures, including buildings, fences, retaining walls.	D5.0 D6.0 D6.2 D6.3 D6.5 D6.6 D6.8 D6.16 D8.0 D8.3 D8.4 D8.5 D8.8	1 2 5 10 11	1 2 5 11	**LS** 9-10 11-12.6 **WS** 11-12.7	

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

CTE Model Curriculum Standards—Industry Sectors and Pathways

Building and Construction Trades

D. Residential and Commercial Construction Pathway

D1.0 Recognize the impact of financial, technical, environmental, and labor trends on the past and future of the construction industry.
D1.2 Understand the environmental regulations that influence residential and commercial design.
D2.0 Apply the appropriate mathematical calculations used in the construction trades.
D2.1 Apply formulas to determine area, volume, lineal, board, and square feet.
D2.2 Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
D2.3 Estimate the materials needed to complete a specific task.
D3.0 Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
D3.1 Identify the elements used in technical drawings, including types of lines, symbols, details, and views.
D3.3 Interpret technical drawings specifications.
D3.4 Identify plumbing, electrical, and mechanical symbols and other abbreviations used in construction drawings.
D3.7 Understand the sequencing and phases of residential and commercial construction projects.
D4.7 Identify types of backfill materials and how they are used.
D5.0 Demonstrate foundation layout techniques to include setting forms, placing reinforcements, and placing concrete according to construction drawings, specifications, and building codes.
D6.0 Demonstrate carpentry techniques for the construction of a single-family residence.
D6.2 Attach a sill plate at top of concrete foundation.
D6.3 Lay out, cut, and install joist supports, rim joists, and floor joists as specified on construction plans.
D6.5 Demonstrate wall and plate layout, including rough openings.
D6.6 Measure, cut, and assemble wall components using appropriate tools and fasteners.
D6.8 Stand, square, plumb, and brace walls.
D6.16 Understand different roofing materials and methods of application.
D8.0 Demonstrate the application of exterior finish materials and protective finishes in building construction.
D8.1 Describe the installation procedures and techniques of masonry siding materials.
D8.3 Install wood, vinyl, and/or manufactured siding.
D8.4 Demonstrate preparation techniques for applying exterior paint and stain.
D8.5 Apply exterior paint and stain according to specifications.
D8.8 Caulk and seal joints to prevent air and moisture infiltration and increase energy efficiency.
D10.1 Demonstrate techniques for cutting, deburring, and joining metallic and nonmetallic water piping.

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.