

Electronic Technology Supplemental Program Resources



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Introduction

This document provides supplemental information for the Electronic Technology program of study. It may be updated or revised as the base program of study, or complementary programs, are updated, added, or removed. Please contact the appropriate Education Programs Professional with any questions.

The Program of Study includes the approved courses, complementary courses, alignment(s) to industry, postsecondary options, and additional information.

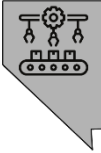
The Equipment List for the Electronic Technology program of study is included and, if applicable, additional items used only in the complementary course(s) are noted.

The Crosswalks and Alignments connect and support the Electronic Technology standards for the Manufacturing program of study. Complementary course standards are not listed in the crosswalks and alignments.

Program of Study Information

The following program of study information sheet as well as the program structure tables for the courses are provided to be able to print separately for handouts. The information provided is based on the best available information at the time of this document and will be updated as appropriate.

Electronic Technology



The Electronic Technology program provides students the opportunity to develop technical skills that are used throughout the electronic industry. Areas of study include safety, tools, direct current (DC), alternating current (AC), schematics, soldering, measuring electricity, Ohm's/Watt's/Kirchhoff's Laws, electronic circuits, and digital theory.

Manufacturing Career Cluster

Manufacturing is focused on planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing, and process engineering.

Postsecondary Options

Certificate/License

- Advanced Manufacturing, CA (CSN)
- Advanced Manufacturing-Machining, CA (CSN)

Associate Degrees

- Electronic Technology: Electronics-Bench Technician, AAS (CSN)
- Electronic Technology: Electronics-Biomedical Equipment Technician (CSN)

Bachelor's Degree

- Instrumentation, BAS (GBC)



For additional information on this cluster, please contact:

cteinfo@doe.nv.gov

Website: <https://doe.nv.gov/offices/craleo/cte>

Required Courses

- Electronic Technology I
- Electronic Technology II
- Electronic Technology II Lab

Complementary Courses

- Electronic Technology Advanced Studies
- CTE Work Experience – Manufacturing
- Industry-Recognized Credential- Electronic Technology

Work-Based Learning Opportunities

- Job Shadowing / Internship / CTE Work Experience/ School-based Enterprise/ Apprenticeship Ready Programs

Career and Technical Student Organization

SkillsUSA/TSA



State Recognized Industry Certifications

Refer to the Governor's Office of Workforce Innovation's

[Nevada Industry Recognized Credential List](#)

Aligned to Industry			
Occupation	Median Wage Per year	Annual Openings	% Growth
Electrical and Electronics Engineers	\$101,780	20,100	3.0%
Electrical and Electronic Engineering Technologists and Technicians	\$63,640	11,100	0.0%
Electro-mechanical and Mechatronics Technologists and Technicians	\$60,360	1,100	-4.0%
Industrial Engineering Technologists and Technicians	\$60,220	6,600	3.0%
Electrical and Electronics Installers and Repairs	\$61,760	9,900	0.0%
Medical Equipment Repairs	\$49,910	7,700	17.0%

Source U.S. Bureau of Labor Statistics 2022

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Program Structure for Electronic Technology

The core course sequencing is provided in the following table. Complementary Courses are available and provided later in this document. The following courses provide a completed program of study. The Lab is a complementary course available concurrently with the Electronic Technology II course.

Core Course Sequence (R) with Lab Course(s) (C)

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
R	Electronic Technology I	ELEC TECH I	47.0105**	17	101	G	1.00	12	17101G1.0012
R	Electronic Technology II	ELEC TECH II	47.0105**	17	101	G	1.00	22	17101G1.0022
C	Electronic Technology II LAB	ELEC TECH II L	47.0105**	17	101	E	1.00	22	17101E1.0022

The complementary courses are provided in the following table. **The qualifying program of study must be completed prior to enrolling in the complementary course(s).** A program does not have to utilize the complementary courses for students to complete their program of study.

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
C	Electronic Technology Advanced Studies	ELEC TECH AS	47.0105**	17	101	E	1.00	11	17101E1.0011
C	Industry Recognized Credential - Electronic Technology	IRC ELEC TECH	47.0105**	13	999	E	1.00	11	13999E1.0011
C	CTE Work Experience - Manufacturing	WORK EXPER MANUF	99.0013	13	098	G	1.00	11	13098G1.0011

CIP Code – Classification of Instructional Programs (CIP) Codes

SCED – School Courses for the Exchange of Data that populates the State Infinite Campus System and the System for Accountability Information in Nevada (SAIN)

**** The CIP code for Electronic Technology was listed incorrectly in both the 2023-24 catalog and the SCED Directory for 2023-24. Please update/correctly in your IC data.**

Course Descriptions

Electronic Technology I

Prerequisite: None

This course introduces the student to electronic practices and fundamentals, roles of electronics in industry, and career development. Topics include safety, tools, fundamental electronic theory, identification of components, analyzing quantities of components, basic direct current (DC), schematics, soldering, measuring electricity, Ohm's/Watt's/Kirchhoff's Laws, and electronic circuits. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Electronic Technology II

Prerequisite: Electronic Technology I

This course is a continuation of Electronic Technology I. This course introduces students to intermediate practices, principles, special equipment, and materials. Students will develop their knowledge and skills learned in Electronic Technology I. Topics include safety, voltage, current and resistance, parallel circuit configurations, series-parallel circuit configurations, alternating current (AC) circuits, fabrication techniques, interpreting schematics, troubleshooting techniques, analyzing digital design and circuitry, and such skills necessary to obtain meaningful employment in the electronics industry or advancement to postsecondary. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Electronic Technology II LAB

Prerequisite: Concurrent enrollment in Electronic Technology II

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth lab experience that applies the processes, concepts, and principles as described in the classroom instruction. The coursework will encourage students to explore and develop advanced skills in their program area. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Electronic Technology Advanced Studies

Prerequisite: Completion of Electronic Technology Program of Study

This course is offered to students who have completed all content standards in the Electronic Technology program of study and desire to pursue advanced study through investigation and in-depth research. Students are expected to work independently or in a team and consult with their supervising teacher for guidance. The supervising teacher will give directions, monitor, and evaluate the students' topic of study. Coursework may include various work-based learning experiences such as internships and job shadowing, involvement in a school-based enterprise, completion of a capstone project, and/or portfolio development. This course may be repeated for additional instruction and credit.

Industry-Recognized Credential – Electronic Technology

Prerequisite: Completion of Electronic Technology Program of Study

This course is offered to students who have completed all content standards in the Electronic Technology program of study and desire to pursue an Industry-Recognized Credential that aligns with the standards and skills associated with the Electronic Technology Program of Study. This course is designed to expand the students' opportunities to pursue certification aligned with employment standards in the industry aligned with this program of study. The supervising teacher will provide instruction aligned with the certification requirements, monitor progress toward certification, and provide the students with appropriate testing or certification opportunities associated with the intended Industry-Recognized Credential that is the subject of the course. This course may be repeated for additional instruction and credit.

CTE Work Experience – Manufacturing

Prerequisite: Completion of Level 2 course in the qualifying program of study

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth CTE work experience that applies the processes, concepts, and principles as described in the classroom instruction. This course will encourage students to explore and develop advanced skills through work-based learning directly related to the program of study. The course must follow NAC 389.562, 389.564, 389.566 regulations.

Equipment List

This recommended list is based upon a classroom size of 25 students. All costs are estimated and may be adjusted once verified and justified by districts with current quotes. No specific equipment vendor or brand names are endorsed due to various possibilities, but school districts should consult with stakeholders to ensure industry-recognized equipment and software are purchased. The intent of this list is to provide school districts with guidance on the equipment needed to implement the state standards for an Electronic Technology program.

CTE Classroom Equipment

Total: \$1,560

QTY	ITEM DESCRIPTION	UNIT	TOTAL
2	Storage Cabinets (36" x 12" x 72") (lockable)	\$400	\$800
2	Fire Extinguisher	\$130	\$260
1	Sink with soap dispense	\$100	\$100
1	First Aid Kit	\$100	\$100
1	Eyewash stations	\$300	\$300

Program Equipment

Total: \$74,400

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Computers (enhanced graphics/memory/speed, download capable)	\$1,500	\$37,500
1	Teacher Computer (enhanced memory/storage. Download capable	\$1,500	\$1,500
1	Technology Storage/Charging System	\$2,000	\$2,000
3	Waveform Analyzer	\$2,000	\$6,000
1	Color LCD 4-channel Oscilloscope	\$2,000	\$2,000
3	Digital, Analog, RF and Audio Signal Generator	\$2,000	\$6,000
6	Analog Oscilloscopes	\$1,000	\$6,000
6	LCR [inductance, capacitance, resistance] Meters	\$1,000	\$6,000
1	Storage Cabinet for Sanitized Eye Protection Equipment	\$800	\$800
6	Video Signal Generators	\$600	\$3,600
6	Mounted Soldering Stations	\$500	\$3,000

Supplemental Program Resources

2024

Instructional Materials

Total:

\$3,000

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Textbooks Approved CTE Instructional Materials list can be found here .	\$100	\$2,500
1	Teacher Textbook Edition and Resources	\$500	\$500

Instructional Supplies

Total:

\$20,000

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Multimeters	\$300	\$7,500
2	Printed Circuit Board (PCB) Shears	\$200	\$400
15	Work Lamps	\$100	\$1,500
Varies	Tools and Equipment (banana clips, high quality precision screwdriver kits, crimp tools, ESD [electrostatic discharge] safe tweezers, ESD wrist straps, anti-static mats, various pliers, shear cutters, wire strippers, chip extractors, nibbling tool, heat shrink gun, etc.)	\$4,000	\$4,000
Varies	Measuring Devices (dial and digital calipers, capacitor testers, etc.)	\$1,500	\$1,500
Varies	Supplies (soldering materials, breadboards, circuit board material, transistors, resistors, integrated circuits, switches, etc.)	\$2,000	\$2,000
Varies	Circuit Board Holder (various sizes)	\$1,500	\$1,500
Varies	Computer Accessories (cases, covers, etc.) (optional)	\$600	\$600
Varies	Personal Protective Equipment (PPE) (gloves, glasses/goggles, etc.)	\$1,000	\$1,000

Other

Total:

\$1,275

QTY	ITEM DESCRIPTION	UNIT	TOTAL
1	Occupational Safety and Health Administration (OSHA) Instructor Training	\$300	\$300
25	Occupational Safety and Health Administration (OSHA) Student Exams	\$39	\$975

Category Totals:

Classroom Equipment	\$1,560
Program Equipment	\$74,400
Instructional Materials	\$3,000
Instructional Supplies	\$20,000
Other	\$1,275
Estimated Program Total	\$100,235

Crosswalks and Alignments for Program of Study Standards

Crosswalks and alignments are intended to assist the teacher make connections for students between the technical skills within the program and academic standards. The crosswalks and alignments are not intended to teach the academic standards but to assist students in making meaningful connections between their CTE program of study and academic courses. The crosswalks are for the required program of study courses, not the complementary courses.

Crosswalks (Academic Standards)

The crosswalks of the Electronic Technology Standards show connections with the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Electronic Technology program connect with and support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in English Language Arts, Mathematics, and Science.

Alignments (Mathematical Practices)

In addition to connections with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Electronic Technology Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Electronic Technology program connect with and support academic learning.

Alignments (Science and Engineering Practices)

In addition to connections with the Nevada Academic Content Standards for Science, many performance indicators support the Science and Engineering Practices. The following table illustrates the alignment of the Electronic Technology Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Electronic Technology program connect with and support academic learning.

Crosswalks (Common Career Technical Core)

The crosswalks of the Electronic Technology Standards show connections with the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Electronic Technology program connect with and support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Electronic Technology Standards are crosswalked to the Manufacturing Career Cluster™ and the Maintenance, Installation, and Repair Career Pathway.

Crosswalk of Electronic Technology Program of Study Standards
and the Nevada Academic Content Standards

English Language Arts: Language Standards

Nevada Academic Content Standards		Performance Indicators
L.11-12.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.	1.1.2

English Language Arts: Reading Standards for Informational Text

Nevada Academic Content Standards		Performance Indicators
RI.11-12.7	Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	4.1.2

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards		Performance Indicators
RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	2.1.14
RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.	2.1.18, 6.1.2, 6.2.2, 6.2.3 7.1.3, 7.1.4, 7.2.4, 7.2.5 7.2.6, 7.2.8, 7.2.12, 8.1.4 8.1.5
RST.11-12.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.	2.1.14, 4.1.3, 6.1.1, 6.2.1
RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.	2.1.14, 7.1.6
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	2.1.1, 2.1.2, 2.1.9, 2.1.13 3.1.1, 4.1.5, 6.2.8, 6.2.9 6.2.10, 7.1.1, 7.1.2, 7.2.1 7.2.11, 8.1.3, 9.1.2

English Language Arts: Speaking and Listening Standards

Nevada Academic Content Standards		Performance Indicators
SL.11-12.1a	Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.	1.1.1, 1.1.2, 1.2.1, 2.1.2
SL.11-12.1d	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 task.	2.1.17, 7.1.2
SL.11-12.2	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.	1.1.1, 1.2.1, 6.1.3, 6.2.4 6.2.7
SL.11-12.3	Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.	11.1.2
SL.11-12.4	Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.	1.1.1, 1.1.2, 1.2.1, 2.1.13 6.1.3, 6.2.4, 6.2.7
SL.11-12.5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	9.1.7
SL.11-12.6	Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)	7.1.2

English Language Arts: Writing Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards	Performance Indicators
WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	2.1.2, 2.1.15, 7.1.6
WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	1.1.2, 1.1.3, 1.2.1, 4.1.5 7.2.1, 7.2.2, 8.1.3
WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.	2.1.14, 6.1.3, 6.2.4, 6.2.6 6.2.7, 6.2.8, 6.2.9, 6.2.10 7.1.1, 7.2.11, 8.1.1, 9.1.2

Math: Algebra – Creating Equations

Nevada Academic Content Standards		Performance Indicators
ACED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	4.2.3, 5.1.3, 5.1.5, 5.2.2 5.2.3, 5.2.5, 5.3.2, 5.3.5

Math: Algebra – Reasoning with Equations and Inequalities

Nevada Academic Content Standards		Performance Indicators
AREI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	4.2.3, 5.1.3, 5.2.3

Math: Algebra – Seeing Structure in Expressions

Nevada Academic Content Standards		Performance Indicators
ASSE.A.1	Interpret expressions that represent a quantity in terms of its context.	4.2.3, 5.1.3, 5.2.3

Math: Functions – Linear, Quadratic, and Exponential Models

Nevada Academic Content Standards		Performance Indicators
FLE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.	4.2.3, 5.1.3, 5.2.3

Math: Number & Quantity – Qualities

Nevada Academic Content Standards		Performance Indicators
NQ.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	6.2.5

Alignment of Electronic Technology Standards and the Mathematical Practices

Mathematical Practices	Electronic Technology Performance Indicators
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	9.1.1
3. Construct viable arguments and critique the reasoning of others.	
4. Model with mathematics.	4.2.3 5.1.2, 5.1.3, 5.1.5, 5.2.5 6.2.5
5. Use appropriate tools strategically.	6.2.3
6. Attend to precision.	2.1.15 3.1.2 4.2.1, 4.2.4 5.2.3 5.3.5 8.1.5
7. Look for and make use of structure.	5.1.3
8. Look for and express regularity in repeated reasoning.	5.3.3, 9.1.1

Alignment of Electronic Technology Standards and the Science and Engineering Practices

Science and Engineering Practices	Electronic Technology Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	3.1.2, 4.1.4
2. Developing and using models.	4.1.3, 6.2.4
3. Planning and carrying out investigations.	5.2.6, 6.1.2, 6.2.3
4. Analyzing and interpreting data.	5.2.6, 5.3.6, 6.2.5
5. Using mathematics and computational thinking.	4.2.1, 4.2.3 5.1.2, 5.1.3, 5.1.5 5.2.2, 5.2.3, 5.3.2, 5.3.3, 5.3.5
6. Constructing explanations (for science) and designing solutions (for engineering).	2.3.15
7. Engaging in argument from evidence.	
8. Obtaining, evaluating, and communicating information.	2.1.15

Crosswalks of Electronic Technology Standards and the Common Career Technical Core

Manufacturing Career Cluster	Performance Indicators
1. Evaluate the nature and scope of the Manufacturing Career Cluster and the role of manufacturing in society and in the economy.	
2. Analyze and summarize how manufacturing businesses improve performance.	7.1.6
3. Comply with federal, state, and local regulations to ensure worker safety and health and environmental work practices.	2.1.2, 2.1.9, 2.1.14
4. Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.	1.4.3, 1.5.1, 11.1.1, 11.1.2
5. Describe government policies and industry standards that apply to manufacturing.	7.2.1
6. Demonstrate workplace knowledge and skills common to manufacturing.	2.1.15, 2.2.2, 2.2.3, 2.3.4, 4.1.6

Maintenance, Installation, and Repair Career Pathway	Performance Indicators
1. Diagnose production process problems and take corrective action to meet production quality standards.	2.2.4, 2.3.4
2. Manage safe and healthy production working conditions and environmental risks.	4.4.4, 6.2.3
3. Make continuous improvement recommendations based on results of production process audits and inspections.	8.1.6
4. Coordinate work teams when producing products to enhance production process and performance.	
5. Demonstrate the safe use of manufacturing equipment.	

Manufacturing Production Process Development Career Pathway	Performance Indicators
1. Produce quality products that meet manufacturing standards and exceed customer satisfaction.	
2. Research, design and implement alternative manufacturing processes to manage production of new and/or improved products.	
3. Monitor, promote, and maintain a safe and productive workplace using techniques and solutions that ensure safe production of products.	
4. Implement continuous improvement processes in order to maintain quality within manufacturing production.	
5. Develop procedures to create products that meet customer needs.	