



Proposed 2020-21 CTE Programs of Study & Course Revisions

The following are proposed revisions to the 2020-21 programs of study based on the annual program of study justification process conducted by the department. In addition to new courses, updated standards, and programs of study offerings, these changes include updates to the Level 4 dual enrollment course codes and updates to many course codes.

New and revised CTE courses will be reviewed on second and final reading by the Tennessee State Board of Education during the February 2020 meeting. If approved, these changes will take effect for the 2020-21 school year.

For additional information on courses or programs of study in the 16 career clusters, please reach out to the appropriate career cluster program manager or visit our web page at <https://tn.gov/education/topic/career-clusters>.

Table of Contents

- Advanced Manufacturing.....2
- Agriculture, Food, & Natural Resources.....5
- Architecture & Construction..... 10
- Arts, Audio/Visual Technology, & Communications..... 13
- Business Management & Administration..... 14
- Education & Training..... 16
- Finance 17
- Government & Public Administration 18
- Health Science..... 18
- Hospitality & Tourism..... 23
- Human Services 25
- Information Technology..... 27
- Law, Public Safety, Corrections, & Security 30
- Marketing, Distribution & Logistics 31
- STEM 33
- Transportation 36
- Middle School..... 39

Advanced Manufacturing

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Advanced Manufacturing can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to John.Mummert@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Electromechanical Technology	Principles of Manufacturing (C13H05)	Introduction to Electromechanical (C13H14)	Advanced Electromechanical Technology (C13H13) -or- Dual Enrollment Electromechanical Technology I (C13H02)	Manufacturing Practicum (C13H08) -or- Dual Enrollment Electromechanical Technology II (C13H19)
	Industry Certification: Machining Level I - Measurement, Materials, and Safety Certification (NIMS) -and/or- OSHA 10 -and/or- Precision Measurement Instruments Certification (includes all subtests)	Industry Certification: Production Certification (CPT) Safety Module	Industry Certification for C13H13: OSHA 30 General Industry	Industry Certification for C13H08: Production Certification (CPT) Manufacturing Processes and Production Module and Maintenance Awareness Module -and/or- OSHA 30 General Industry
Machining Technology	Principles of Manufacturing (C13H05)	Principles of Machining I (C13H09)	Principles of Machining II (C13H06) -or- Dual Enrollment Machining Technology I (C13H01)	Manufacturing Practicum (C13H08) -or- Dual Enrollment Machining Technology II (C13H20)
	Industry Certification: Machining Level I - Measurement, Materials, and Safety Certification (NIMS) -and/or- OSHA 10 -and/or- Precision Measurement Instruments Certification (includes all subtests)	Industry Certification: Production Certification (CPT) Safety Module	Industry Certification for C13H06: Production Certification (CPT) Quality Practices and Measurement Module -and/or- OSHA 30 General Industry	Industry Certification for C13H08: Production Certification (CPT) Manufacturing Processes and Production Module and Maintenance Awareness Module -and/or- OSHA 30 General Industry

Mechatronics	Principles of Manufacturing (C13H05)	Digital Electronics (C13H07) -or- Robotics & Automated Systems (C13H15) -or- Project Lead the Way (PLTW) Computer Integrated Manufacturing (C13H11)	Mechatronics I ¹ (C13H16) -or- Dual Enrollment Mechatronics I (C13H04)	Mechatronics II ¹ (C13H17) -or- Manufacturing Practicum (C13H08) -or- Dual Enrollment Mechatronics II (C13H21)
	Industry Certification: Machining Level I - Measurement, Materials, and Safety Certification (NIMS) -and/or- OSHA 10 -and/or- Precision Measurement Instruments Certification (includes all subtests)	Industry Certification for C13H15: FANUC	Industry Certification for C13H16: OSHA 30 General Industry	Industry Certification for C13H17: Level 1 Siemens Certified Mechatronic Systems Assistant -and/or- OSHA 30 General Industry Industry Certification for C13H08: Production Certification (CPT) Manufacturing Processes and Production Module and Maintenance Awareness Module -and/or- OSHA 30 General Industry
Welding	Principles of Manufacturing (C13H05)	Welding I (C13H12)	Welding II ² (C13H10) -or- Dual Enrollment Welding I (C13H03)	Manufacturing Practicum (C13H08) -or- Dual Enrollment Welding II (C13H18)
	Industry Certification: Machining Level I - Measurement, Materials, and Safety Certification (NIMS) -and/or- OSHA 10 -and/or- Precision Measurement Instruments Certification (includes all subtests)	Industry Certification: AWS SENSE Entry Level Welder -and/or- NCCER Core Curriculum	Industry Certification for C13H10: AWS SENSE Advanced Level Welder or American Welding Society Certified Welder -and/or- OSHA 30 General Industry	Industry Certification for C13H08: Production Certification (CPT) Manufacturing Processes and Production Module and Maintenance Awareness Module -and/or- OSHA 30 General Industry

¹ Local dual credit and/or dual enrollment opportunities exist for this course.

² May be taught for 1 or 2 credits.

Available courses for elective credit in this cluster:

- ***Work-Based Learning: Career Practicum*** (C25H00) course may substitute for the Level 4 offering in all programs of study

Agriculture, Food, & Natural Resources

The following are **proposed changes** to programs of study within this career cluster based on the 2020-21 programs of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Agriculture, Food, & Natural Resources can also be found on the [career cluster website](#).

Advanced Food Science: Standard 22 was reworded to address blockchain trends dealing food processing and marketed in national and international markets.

Applied Environmental Science: Standard 17 was added to place more emphasis on the analysis of diseases impacting plant and animal species. Added content to standard 22 to clarify positive conservation practices used to improve ecosystems.

Food Science and Safety: Added standard 15 to address blockchain trends dealing with food safety and compliance issues was added to increase student mastery of the application of current food science and safety technology within the agricultural industry.

Natural Resource Management: The wording in standards 8 and 9 were expanded to better align to the national Agriculture, Food, and Natural Resources content standards. Additional language was added to standard 19 to clarify current environmental conservation mitigation issues which will increase student mastery of the standard.

Principles of Food Production: With the increased concerns dealing with food quality, safety, and the need to increase the quantity of food to feed our growing population, genomics was added to help build a stronger genetic content base for in plant science in standard 5 and for animal science in standard 15. Also updated grammar in standards 4, 7, and 17. Note: Genomics is the study of the organism's (plant or animal) complete set of DNA including all of its genes, focusing on the structure, function, mapping, and editing which means safer food.

Supervised Agricultural Experience (SAE): Additional language was added to standard 2 to align with the new national SAE guidelines which will increase study mastery in the agricultural experiential learning opportunities. Additional wording was added to standards 3 and 4 to provide additional clarification to the expectation of the standard. Standard 16 was added to increase the content knowledge related to agricultural current events.

Unmanned Aircraft Systems in Agriculture: This is a new course that was created to focus on the operation of sUAS with specific content related to precision agricultural being emphasize.

Questions about courses and programs of study within this career cluster should be directed to Steven.Gass@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Agribusiness	Agriscience ¹ (C18H19)	Principles of Agribusiness (C18H14)	Organizational Leadership and Communications (C18H18) -or- Dual Enrollment Agribusiness I (C18H03)	Agricultural Business and Finance ² (C18H11) -or- Statewide Dual Credit Intro to Agribusiness (C18H10) -or- Dual Enrollment Agribusiness II (C18H32)
	Industry Certification: OSHA - 10		Industry Certification for C18H18: OSHA 30 General Industry	Industry Certification for C18H11: OSHA 30 General Industry
	Supervised Agricultural Experience (C18H23)			
Agricultural Engineering and Applied Technologies	Agriscience ¹ (C18H19)	Principles of Agricultural Mechanics (C18H12)	Agricultural Power and Equipment (C18H13) -or- Dual Enrollment Agricultural Engineering & Applied Technologies I (C18H02)	Agricultural and Biosystems Engineering (C18H22) -or- Unmanned Aircraft Systems in Agriculture (C18HXX) -or- Dual Enrollment Agricultural Engineering & Applied Technologies II (C18H35)
	Industry Certification: OSHA - 10	Industry Certification: Precision Measurement Instruments Certification	Industry Certification for C18H13: OSHA 30 General Industry -and/or- Briggs and Stratton Basic Small Engine Certification	Industry Certification for C18H22: OSHA 30 General Industry -and/or- Briggs and Stratton Master Service Technician Industry Certification for C18HXX: Remote Pilot License (FFA Part 107)
	Supervised Agricultural Experience (C18H23)			

Environmental and Natural Resource Management	Agriscience ¹ (C18H19)	Applied Environmental Science ¹ (C18H25) -or- Cambridge IGCSE Environmental Management (C18H07)	Plant and Soil Science (C18H15) -or- Dual Enrollment Environmental & Natural Resources Management I (C18H06)	Natural Resources Management (C18H28) -or- Unmanned Aircraft Systems in Agriculture (C18HXX) -or- AP Environmental Science (G03H25) -or- Dual Enrollment Environmental & Natural Resources Management II (C18H36)
	Industry Certification: OSHA - 10		Industry Certification for C18H15: OSHA 30 General Industry	Industry Certification for C18H28: OSHA 30 General Industry Industry Certification for C18HXX: Remote Pilot License (FFA Part 107)
	Supervised Agricultural Experience (C18H23)			
Food Science	Agriscience ¹ (C18H19)	Principles of Food Production (C18H29)	Food Science and Safety (C18H26) -or- Dual Enrollment Food Science I (C18H04)	Advanced Food Science (C18H24) -or- Dual Enrollment Food Science II (C18H38)
	Industry Certification: OSHA - 10		Industry Certification for C18H26: OSHA 30 General Industry	Industry Certification for C18H24: OSHA 30 General Industry
	Supervised Agricultural Experience (C18H23)			

Horticulture Science	Agriscience ¹ (C18H19)	Principles of Plant Science and Hydroculture (C18H30)	Greenhouse Management (C18H17) -or- Statewide Dual Credit Introduction to Plant Science (C18H09) -or- Dual Enrollment Horticulture Science I (C18H05)	Landscaping and Turf Science (C18H16) -or- Unmanned Aircraft Systems in Agriculture (C18HXX) -or- Dual Enrollment Horticulture Science II (C18H33)
	Industry Certification: OSHA - 10		Industry Certification for C18H17: OSHA 30 General Industry	Industry Certification for C18H16: Tennessee Specific Industry Certification for Horticulture Science -and/or- Commercial Pesticide Certification Industry Certification for C18HXX: Remote Pilot License (FFA Part 107)
	Supervised Agricultural Experience (C18H23)			
Veterinary and Animal Science	Agriscience ¹ (C18H19)	Small Animal Science (C18H20)	Large Animal Science (C18H27) -or- Dual Enrollment Veterinary & Animal Science I (C18H01)	Veterinary Science ¹ (C18H21) -or- Unmanned Aircraft Systems in Agriculture (C18HXX) -or- Dual Enrollment Veterinary & Animal Science II (C18H34)
	Industry Certification: OSHA - 10		Industry Certification for C18H27: OSHA 30 General Industry	Industry Certifications for C18H21: TN Specific Industry Certification Animal Science -and/or- OSHA 30 General Industry Industry Certification for C18HXX: Remote Pilot License (FFA Part 107)
	Supervised Agricultural Experience (C18H23)			

¹ Satisfies one lab science credit required for graduation. ² Satisfies ½ credit of Personal Finance required for graduation.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** course may substitute for the Level 4 offering in all programs of study.
- **Introduction to Geographic Information Systems (C03H14)** is a supplemental course which can be offered in addition to courses within the Agricultural Engineering and Applied Technologies program of study but does not count toward concentrator status.

Architecture & Construction

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Architecture & Construction can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to John.Mummert@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Architectural & Engineering Design	Architectural & Engineering Design I (C17H13)	Architectural & Engineering Design II (C17H14)	Architectural & Engineering Design III ¹ (C17H10) -or- Dual Enrollment Architectural & Engineering Design I (C17H04)	Engineering Practicum (C21H14) -and/or- AP Calculus (G02H24 or G02H25) -and/or- AP Physics (G03H27, G03H28, G03H24, or G03H29) -or- Dual Enrollment Architectural & Engineering Design II (C17H28)
			Industry Certification for C17H01: Certified Solidworks Associate -and/or- AutoCAD User	
Interior Design	Foundations of Interior Design (C17H12)	Residential Interior Design (C17H11)	Commercial Interior Design (C17H20) -or- Dual Enrollment Interior Design I (C17H05)	Advanced Interior Design (C17H19) -or- Dual Enrollment Interior Design II (C17H29)

Mechanical, Electrical, & Plumbing (MEP) Systems	Fundamentals of Construction (C17H15)	MEP Systems (C17H23)	HVAC (C17H17) -and/or- Electrical Systems (C17H16) -and/or- Plumbing Systems (C17H18) -or- Dual Enrollment Mechanical, Electrical, & Plumbing Systems I (C17H03)	Construction Practicum (C17H22) -or- Dual Enrollment Mechanical, Electrical, & Plumbing Systems II (C17H30)
	Industry Certification: NCCER Core Curriculum -and/or- OSHA 10	Industry Certification: Precision Measurement Instruments Certification (includes all subtests)	Industry Certifications for C17H17: HVAC Excellence, Heating, Electrical, Air Conditioning Technology (H.E.A.T.) -and/or- HVAC Excellence Employment Ready Certifications -and/or- Universal R-410A EPA Section 608 Universal Industry Certification for C17H16: NCCER Electrical Level One -and/or- OSHA 30 Construction Industry Certification for C17H18: NCCER Plumbing Level One	
Residential & Commercial Construction	Fundamentals of Construction (C17H15)	Residential & Commercial Construction I (C17H24)	Residential & Commercial Construction II ¹ (C17H25) -or- Dual Enrollment Residential & Commercial Construction I (C17H01)	Construction Practicum (C17H22) -or- Dual Enrollment Residential & Commercial Construction II (C17H31)
	Industry Certification: NCCER Core Curriculum -and/or- OSHA 10	Industry Certification: NCCER Construction Technology	Industry Certification for C17H25: OSHA 30 Construction	

Structural Systems	Fundamentals of Construction (C17H15)	Structural Systems I (C17H26)	Structural Systems II ¹ (C17H27) -or- Dual Enrollment Structural Systems I (C17H02)	Construction Practicum (C17H22) -or- Dual Enrollment Structural Systems II (C17H32)
	Industry Certification: NCCER Core Curriculum -and/or- OSHA 10	Industry Certification: NCCER Carpentry Level One -and/or- Precision Measurement Instruments Certification (includes all subtests)	Industry Certification for C17H27: NCCER Carpentry Level Two -and/or- OSHA 30 Construction	

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Introduction to Geographic Information Systems (C03H14)** is a supplemental course which can be offered in addition to courses within the Architectural and Engineering Design program of study but does not count toward concentrator status.
- **Welding I (C13H12)** is a supplemental course which can be offered in addition to courses within the MEP, Residential & Commercial Construction, and Structural Systems programs of study but does not count toward concentrator status.

Arts, Audio/Visual Technology, & Communications

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Arts, Audio/Visual Technology, & Communications can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Bryant.Nall@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Audio/Visual Production	A/V Production I (C11H01)	A/V Production II (C11H02)	A/V Production III (C11H03) -or- Dual Enrollment Audio/Visual Production I (C11H00)	Applied Arts Practicum (C11H07) -and/or- AP English Language and Composition (G01H17) -or- Dual Enrollment Audio/Visual Production II (C11H15)
Digital Arts & Design	Digital Arts & Design I (C11H04)	Digital Arts & Design II (C11H05)	Digital Arts & Design III (C11H06) -or- Dual Enrollment Arts & Design I (C11H08)	Applied Arts Practicum (C11H07) -and/or- AP Studio Art: 2-D Design (G05H30) -or- Dual Enrollment Arts & Design II (C11H09)
			Industry Certification for C11H06: Adobe Certified Associate	
Fashion Design	Visual Art I (G05H08)	Foundations of Fashion Design (C11H09)	Fashion Design (C11H10) -or- Dual Enrollment Fashion Design I (C11H13) -or- Cambridge International AS Level <u>Art & Design</u> (G05H58)	Advanced Fashion Design (C11H11) -or- Dual Enrollment Fashion Design II (C11H14)

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Journalism (G01H15)** is a supplemental course which can be offered in addition to courses within the Audio/Visual Production program of study but does not count toward concentrator status.

Business Management & Administration

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Business Management & Administration can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to llene.D.Karp@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Business Management	Introduction to Business & Marketing (C12H26)	Business Communications (C12H16) -or- Accounting I (C29H00) -or- Cambridge IGCSE Accounting (C29H08)	Business Management (C12H17) -or- Statewide Dual Credit Introduction to Business (C12H44) -or- Dual Enrollment Business Management I (C12H01) -and/or- Principles of Management CLEP -and/or- Cambridge AS Business (C12H14)	Business & Entrepreneurship Practicum (C12H35) -and/or- Virtual Enterprise International ¹ (C12H23) -or- Dual Enrollment Business Management II (C12H47) -and/or- Principles of Management CLEP
			Industry Certification for C12H17: Google Suite	
Health Services Administration	Introduction to Business & Marketing (C12H26) -or- Health Science Education (C14H14)	Health Information Technology (C12H34)	Business Management (C12H17) -or- Statewide Dual Credit Introduction to Business (C12H44) -or- Dual Enrollment Health Services Administration I (C12H03) -or- Cambridge AS Business (C12H14)	Health Services Administration Practicum (C12H38) -or- Dual Enrollment Health Services Administration (C12H49)
			Industry Certification for C12H17: Google Suite	

Human Resources Management	Introduction to Business & Marketing (C12H26)	Business Communications (C12H16)	Human Resources Management (C12H36) -or- Dual Enrollment Human Resources Management I (C12H39)	Human Resources Management Practicum (C12H37) -or- Dual Enrollment Human Resources Management (C12H50)
			Industry Certification for C12H36: Google Suite	
Office Management	Computer Applications (C12X00)	Business Communications (C12H16)	Business Management (C12H17) -or- Statewide Dual Credit Introduction to Business (C12H44) -or- Dual Enrollment Office Management I (C12H02) -and/or- Principles of Management CLEP -or- Cambridge AS Business (C12H14)	Advanced Computer Applications (C12H25) -or- Dual Enrollment Office Management II (C12H48) -and/or- Information Systems CLEP
			Industry Certification for C12H17: Google Suite	Industry Certifications for C12H25: Microsoft Office Specialist: (Excel) (PowerPoint) (Word) -and/or- Microsoft Office Expert -and/or- Microsoft Officer Master

¹ Satisfies ½ credit of Economics required for graduation.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **American Business Legal Systems (C12H20)** and **Business Economics (C12H21)** are supplemental courses which can be offered in addition to courses within the Business Management and Human Resources Management programs of study but do not count toward concentrator status.

Education & Training

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Education & Training can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Sarah.G.Williams@tn.gov

Program of Study	Level 1	Level 2	Level 3	Level 4
Early Childhood Education Careers	Early Childhood Education Careers I (C32H06)	Early Childhood Education Careers II (C32H07)	Early Childhood Education Careers III (C23H08) -or- Dual Enrollment Early Childhood Education Careers I (C32H10)	Early Childhood Education Careers IV (C32H09) -or- Dual Enrollment Early Childhood Education Careers II (C32H18)
	Industry Certification for C32H06 and C32H07: TECTA Center-Based Orientation Certificate			Industry Certification for C23H09: Child Development Associate (CDA)
Educational Therapy and Support	Educational Therapy and Support I (C32H12)	Educational Therapy and Support II (C32H13)	Educational Therapy and Support III (C32H14) -or- Dual Enrollment Educational Therapy and Support I (C32H16)	Educational Therapy and Support Practicum (C32H15) -or- Dual Enrollment Educational Therapy and Support II (C32H19)
Teaching as a Profession (K-12)	Fundamentals of Education (C32H00)	Teaching as a Profession I (C32H01)	Teaching as a Profession II (C32H02) -or- Dual Enrollment Teaching as a Profession (K-12) I (C32H04)	Teaching as a Profession Practicum (C32H03) -or- Dual Enrollment Teaching as a Profession (K-12) II (C32H05)

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Lifespan Development (C19H17)** is a supplemental course which can be offered in addition to courses within the Early Childhood Education Careers program of study but does not count toward concentrator status.

Finance

The following are **proposed changes** to elective courses within this career cluster based on the 2020-21 programs of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Finance can also be found on the [career cluster website](#).

Personal Finance: This course underwent a complete standards update to better align with current business and industry standards to ensure students are proficient financial decision makers and have a positive impact on their future financial well-being.

Program of Study	Level 1	Level 2	Level 3	Level 4
Accounting	Introduction to Business & Marketing (C12H26)	Accounting I (C29H00) -or- Cambridge IGCSE Accounting (C29H04)	Accounting II (C29H01) -or- Dual Enrollment Accounting I (C29H05) -or- Cambridge AS/A Accounting (C29H06)	Financial Planning (C29H02) -or- Statistics (G02H37) -or- AP Statistics (G02H26) -and/or- Dual Enrollment Accounting II (C29H07) -and/or- Financial Accounting CLEP
			Industry Certification for C29H01: Quick Books Certified User	
Banking and Finance	Introduction to Business & Marketing (C12H26)	Accounting I (C29H00) -or- Cambridge IGCSE Accounting (C29H08)	Banking and Finance (C29H03) -or- Dual Enrollment Banking & Finance I (C29H09)	Financial Planning (C29H02) -or- Dual Enrollment Banking & Finance II (C29H10)

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Personal Finance (C12H24)** is a course required for graduation but does not count toward concentrator status in a program of study.

Government & Public Administration

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Government & Public Administration can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Sloan.Hudson@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Leadership in Government	JROTC I (G08H04)	JROTC II (G08H05)	U.S. Government and Civics (G04H12) -or- JROTC III (G08H06) -or- Dual Enrollment Leadership in Community Emergency Response I (C15H22)	Success Skills in Service Learning (C25H13) -or- JROTC IV (G08H07) -or- Dual Enrollment Leadership in Community Emergency Response II (C15H23)
Public Management and Administration	Principles of Public Service (C15H14)	Public Management and Administration (C15H16)	Public Law and Budgeting (C15H15) -or- Dual Enrollment Public Management & Administration I (C15H06)	AP US Government & Politics (G04H26) -or- Success Skills Through Service Learning (C25H13) -or- Dual Enrollment Public Management & Administration II (C15H24)

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.

Health Science

The following are **proposed changes** to elective courses within this career cluster based on the 2020-21 programs of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Health Science can also be found on the [career cluster website](#).

Public Health Program of Study: This program of study will retire as of June 30, 2020 pending State Board of Education approval of new courses identified below.

Medical Assisting: This is a new course written to combine standards from the Medical Therapeutics and Diagnostic Medicine courses along with new standards to more closely align to the content covered on the more common Clinical Medical Assistant certification tests.

Public Health and Epidemiology: This is a new course written to combine standards from the Behavioral and Community Health and Global Health and Epidemiology courses to consolidate the content and add it to the Therapeutic Services program of study, so the Public Health program of study can be retired.

Pharmacological Science: This course was heavily revised to more closely align the standards with the content covered on multiple certified pharmacy technician certification tests.

Questions about courses and programs of study within this career cluster should be directed to Sloan.Hudson@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Diagnostic Services	Health Science Education (C14H14)	Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Diagnostic Medicine (C14H12) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Diagnostic Medicine (C14H12) -or- Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Dual Enrollment Diagnostic Services I (C14H02) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Cardiovascular Services (C14H18) -and/or- Clinical Internship (C14H11) -or- Dual Enrollment Diagnostic Services II (C14H02)
		Industry Certification for C14H12: OSHA 10 General Industry	Industry Certification for C14H12: OSHA 10 General Industry	Industry Certification following C14H18 AND C14H11: Certified EKG Technician

Emergency Services	Health Science Education (C14H14)	Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Medical Therapeutics (C14H15) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Medical Therapeutics (C14H15) -or- Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Dual Enrollment Emergency Services I (C14H04) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Emergency Medical Services ¹ (C14H13) -or- Emergency Medical Services Practicum (C14H24) -or- Dual Enrollment Emergency Services II (C14H29)
		Industry Certification for C14H15: OSHA 10 General Industry	Industry Certification for C14H15: OSHA 10 General Industry	Industry Certification: Emergency Medical Responder (First Responder)
Nursing Services	Health Science Education (C14H14)	Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Medical Therapeutics (C14H15) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Medical Therapeutics (C14H15) -or- Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Dual Enrollment Nursing Services I (C14H03) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Nursing Education (C14H16) -and/or- Clinical Internship (C14H11) -or- Dual Enrollment Nursing Services II (C14H27)
		Industry Certification for C14H15: OSHA 10 General Industry	Industry Certification for C14H15: OSHA 10 General Industry	Industry Certification for C14H16: Certified Nursing Assistant (CNA) -and/or- Industry Certification following C14H16 AND C14H11: Certified Patient Care

Public Health	Health Science Education (C14H14)	Behavioral and Community Health (C14H17) Course retiring 06/30/2020	Global Health and Epidemiology (C14H19) -or- Dual Enrollment Public Health I (C14H01) Courses retiring 06/30/2020	Public Health Practicum (C14H23) -or- Dual Enrollment Public Health II (C14H01) Courses retiring 06/30/2020
			Industry Certification for C14H19: OSHA 10 General Industry	
Sport and Human Performance	Health Science Education (C14H14)	Anatomy and Physiology ¹ (G03H31 or C14H09) -or- Rehabilitation Careers (C14H08) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Anatomy and Physiology ¹ (G03H31 or C14H09) if the student did not take it as Level 2, he/she must take it as Level 3 course. For students who took Level 2 A&P, choices include: Rehabilitation Careers (C14H08) -or- Medical Therapeutics (C14H15) -or- Dual Enrollment Exercise Physiology I (C14H06) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Exercise Science (C14H22) -or- Clinical Internship (C14H11) -or- Dual Enrollment Exercise Physiology II (C14H30)
		Industry Certification C14H08: OSHA 10 General Industry	Industry Certification C14H08: OSHA 10 General Industry	Industry Certification following C14H22 AND C14H11: Certified Personal Trainer

Therapeutic Services	Health Science Education (C14H14)	Anatomy and Physiology ¹ (G03H31 or C14H09) -or- One option from Level 3 -or- Dual Enrollment Anatomy and Physiology (G03H43)	Anatomy and Physiology ¹ (G03H31 or C14H09) if the student did not take it as Level 2, he/she must take it as Level 3 course. For students who took Level 2 A&P, choices include: Dental Science (C14H21) -or- Pharmacological Science (C14H20) -or- Nutrition Science and Diet Therapy ¹ (C19H16) -or- Medical Therapeutics (C14H15) -or- Medical Assisting (TBD) -or- Public Health and Epidemiology (TBD) Dual Enrollment Therapeutic Services I (C14H05) -or- Dual Enrollment Anatomy and Physiology (G03H43)	Clinical Internship (C14H11) -or- Dual Enrollment Therapeutic Services II (C14H28)
			Industry Certification following C14H20 AND C14H11: Certified Pharmacy Technician Industry Certification following C14H21 AND C14H11: National Entry Level Dental Assistant (NELDA)	Industry Certification following C14H15 AND C14H11: Certified Clinical Medical Assistant Industry Certification for C14H11: OSHA 10 General Industry

¹ Satisfies one lab science credit for graduation.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Medical Terminology (C14H07)** is a supplemental course which can be offered in addition to courses within the Health Science career cluster but does not count toward concentrator status

Hospitality & Tourism

The following are **proposed changes** to elective courses within this career cluster based on the 2020-21 programs of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Hospitality & Tourism can also be found on the [career cluster website](#).

Hospitality & Tourism Management I: This is a new course name with new and revised standards on multiple skills and content knowledge needed for relevancy and rigor to prepare for training, postsecondary, and occupations in the hospitality segments (travel and tourism, lodging, food and beverage, and recreation).

Hospitality & Tourism Management II: This is a new course name with new and revised standards on multiple skills and content knowledge needed for relevancy and rigor to prepare for training, postsecondary, and occupations in the hospitality segments (travel and tourism, lodging, food and beverage, and recreation).

Hospitality & Tourism Management III: This is a new course name with new and revised standards on multiple skills and content knowledge needed for relevancy and rigor to prepare for training, postsecondary, and occupations in the hospitality segments (travel and tourism, lodging, food and beverage, and recreation).

Questions about courses and programs of study within this career cluster should be directed to Sarah.G.Williams@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Culinary Arts	Culinary Arts I (C16H06)	Culinary Arts II (C16H07)	Culinary Arts III (C16H08) -or- Dual Enrollment Culinary Arts I (C16H01)	Culinary Arts IV (C16H09) -or- Dual Enrollment Culinary Arts II (C16H14)
			Industry Certification for C16H08: ServSafe Food Manager -and/or- Certified Fundamentals Cook (CFC)	Industry Certification for C16H09: ServSafe Food Manager -and/or- Certified Fundamentals Cook (CFC)

Hospitality and Tourism Management	Hospitality & Tourism Exploration (C16H10) Hospitality & Tourism Management I (C16HXX) -or- Cambridge IGCSE <u>Travel & Tourism</u> (C16H03)	Hospitality Marketing (C16H13) Hospitality & Tourism Management II (C16HXX) -or- Cambridge International AS Level <u>Travel & Tourism</u> (C16H04)	Hospitality Management (C16H11) Hospitality & Tourism Management III (C16HXX) -or- Dual Enrollment Hospitality & Tourism Management I (C16H02)	Event Planning & Management (C16H12) -or- Dual Enrollment Hospitality & Tourism Management II (C16H15)
			Industry Certification for C16HXX: Certified Hospitality & Tourism Management Professional (CHTMP)	

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.

Human Services

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Human Services can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Sarah.G.Williams@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Cosmetology	Cosmetology I (C19H12)	Cosmetology II (C19H14)	Cosmetology III (C19H13) -or- Dual Enrollment Cosmetology I (C19H04)	Cosmetology IV (C19H21) -or- Dual Enrollment Cosmetology II (C19H23)
				Industry Certification for C19H21: TN Cosmetology & Barber Examiners— TN Cosmetologist 1010
Barbering	Barbering I (C19H09)	Barbering II (C19H10)	Barbering III (C19H11) -or- Dual Enrollment Barbering I (C19H05)	Entrepreneurship ¹ (C12H31) -or- Dual Enrollment Barbering II (C19H24)
			Industry Certification for C19H11: TN Cosmetology & Barber Examiners— TN Master Barber 1010	

Dietetics and Nutrition	Introduction to Human Studies (C19H19)	Nutrition Across the Lifespan (C19H15) -or- Cambridge IGCSE Food & Nutrition (C19H08)	Nutrition Science and Diet Therapy (C19H16) -or- Dual Enrollment Dietetics & Nutrition I (C19H03)	Human Services Practicum (C19H20) -and/or- Psychology (G04H15) -and/or- Sociology (G04H14) -or- Dual Enrollment Dietetics & Nutrition II (C19H22)
			Industry Certification for C19H16: Tennessee Specific Industry Certification for Dietetics & Nutrition (in pilot)	
Human and Social Sciences	Introduction to Human Studies (C19H19)	Lifespan Development (C19H17)	Family Studies (C19H18) -or- Dual Enrollment Human and Social Sciences I (C19H02) -or- Cambridge IGCSE Sociology (G04H65) -or- Human Growth and Development CLEP	Human Services Practicum (C19H20) -and/or- Psychology (G04H15) -and/or- Sociology (G04H14) -or- Dual Enrollment Human and Social Sciences II (C19H26)
			Industry Certification for C19H18: Tennessee Specific Industry Certification for Human and Social Sciences (in pilot)	

¹ Satisfies ½ credit of Economics required for graduation.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.

Information Technology

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Information Technology can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Bryant.Nall@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Coding	Computer Science Foundations (C10H11) -or- Cambridge IGCSE Computer Science (C10H07)	Coding I (C10H14) -or- AP Computer Science Principles (G02H44)	Coding II (C10H15) -or- Mobile App Development (C10H22) -or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Coding I (C10H01)	Coding Practicum (C10H08) -and/or- AP Computer Science A (G02H45) -and/or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Coding II (C10H28) -or- Cambridge International AS Level Computer Science (C10H25)
	Industry Certification for C10H11: CompTIA IT Fundamentals		Industry Certification for C10H15: Microsoft Technology Associate Software Development Fundamentals -and/or- CIW Web Foundation -and/or- JavaScript Specialist -and/or- Advanced HTML5/CSS3	

Cybersecurity	Computer Science Foundations (C10H11)	Cybersecurity I (C10H19) -and/or- AP Computer Science Principles (G02H44)	Cybersecurity II (C10H20) -and/or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Cybersecurity I (C10H24)	Cybersecurity Practicum (C10H21) -and/or- AP Computer Science Principles (G02H44) Dual Enrollment Cybersecurity II (C10H31)
	Industry Certification for C10H11: CompTIA IT Fundamentals	Industry Certification for C10H19: CompTIA A+	Industry Certification for C10H20: CompTIA Network +	Industry Certification for C10H21: CompTIA Security + -and/or- Associate of ISC2
Networking Systems	Computer Science Foundations (C10H11)	Computer Systems (C10H10)	Networking (C10H13) -or Dual Enrollment Networking Systems I (C10H02)	Cabling and Internetworking (C10H09) -and/or- IT Clinical Internship (C10H12) -or- Dual Enrollment Networking Systems II (C10H29)
	Industry Certification: CompTIA IT Fundamentals	Industry Certification: Comp TIA A+ -and/or- Cisco Certified Entry Network Tech (CCENT)	Industry Certification for C10H13: CompTIA Network + -and/or- Microsoft Technology Associate Infrastructure -and/or- Cisco IT Essentials PC Hardware & Software Certification -and/or- Cisco Certified Network Associate (CCNA)	

Web Design	Computer Science Foundations (C10H11) -or- Cambridge IGCSE Information and Communication Technology (C10H26)	Web Design Foundations (C10H16) -and/or- AP Computer Science Principles (G02H44)	Web Site Development (C10H17) -and/or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Web Design I (C10H03)	Web Design Practicum (C10H18) -and/or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Web Design II (C10H30)
	Industry Certification: CompTIA IT Fundamentals		Industry Certification: CIW Web Design Specialist -and/or- CIW Web Foundation -and/or- JavaScript Specialist -and/or- Advanced HTML5/CSS3	

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Introduction to Geographic Information Systems (C03H14)** is a supplemental course which can be offered in addition to courses within the Cybersecurity program of study but does not count toward concentrator status.

Law, Public Safety, Corrections, & Security

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Law, Public Safety, Corrections, & Safety can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Sloan.Hudson@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Criminal Justice and Correction Services	Criminal Justice I (C30H00)	Criminal Justice II (C30H01)	Criminal Justice III: Forensic Criminal Investigations (C30H02) -or- Statewide Dual Credit: Criminal Justice (C30H11) ¹ -or- Dual Enrollment Criminal Justice and Correction Services I (C30H12)	Criminal Justice Practicum (C30H03) -or- Dual Enrollment Criminal Justice and Correction Services II (C30H13)
Fire Management Services	Principles of Fire and Emergency Services (C30H04)	Fire Prevention (C30H05)	Fire Science I (C30H06) -or- Dual Enrollment Fire Management Services I (C30H14)	Fire Science II (C30H07) -or- Dual Enrollment Fire Management Services II (C30H15)
Pre-Law	Pre-Law I (C30H08)	Pre-Law II (C30H09)	Pre-Law III (C30H10) -or- Dual Enrollment Pre-Law I (C30H16)	Success Skills in Service Learning (C25H13) -or- AP U.S. Government and Politics (G04H26) -or- Dual Enrollment Pre-Law II (C30H17)

¹ Statewide Dual Credit Criminal Justice **requires** Criminal Justice I **and** Criminal Justice II as prerequisite courses. Students cannot take Statewide Dual Credit Criminal Justice without having already completed the first two courses in the program of study.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **American Business Legal Systems (C12H20)** is a supplemental course which can be offered in addition to courses within the Legal and Correction Services program of study but does not count toward concentrator status.

Marketing, Distribution & Logistics

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Marketing, Distribution & Logistics can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Ilene.D.Karp@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Entrepreneurship	Introduction to Business & Marketing (C12H26)	Marketing and Management I: Principles ¹ (C31H00)	Entrepreneurship ¹ (C31H05) -or- Dual Enrollment Entrepreneurship I (C31H12) -or- Cambridge IGCSE Enterprise (C31H13)	Business & Entrepreneurship Practicum (C12H35) -or- Virtual Enterprise International ¹ (C12H23) -or- Dual Enrollment Entrepreneurship II (C31H14)
Marketing Management	Introduction to Business & Marketing (C12H26)	Marketing and Management I: Principles ¹ (C31H00)	Marketing and Management II: Advanced Strategies (C31H01) -or- Social Media Marketing and Analytics (C31H02) -or- Dual Enrollment Marketing Management I (C31H10) -and/or- Principles of Marketing CLEP	Advertising and Public Relations (C31H03) -or- Retail Operations ¹ (C31H04) -or- Event Planning & Management (C16H12) -or- Dual Enrollment Marketing Management II (C31H11) -and/or- Principles of Marketing CLEP
			Industry Certifications for C31H02: Hootsuite Platform Certification -and/or- Hootsuite Social Marketing Certification	

Supply Chain Management	Introduction to Business & Marketing (C12H26) -or- Marketing and Management I: Principles ¹ (C31H00)	Foundations of Supply Chain Management (C31H06)	Supply Chain Management I (C31H07) -or- Dual Enrollment Supply Chain Management I (C31H15)	Supply Chain Management II (C31H08) -or- Supply Chain Management Practicum (C31H09) -or- Dual Enrollment Supply Chain Management II (C31H16)
		Industry Certification for C31H06: Microsoft Office Specialist (Excel)	Industry Certification for C31H07: Certified Logistics Technician	

¹ Satisfies ½ credit of Economics required for graduation.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Business Communications (C12H16)** is a supplemental course which can be offered in addition to courses within these programs of study but does not count toward concentrator status.

STEM

There are **no changes** to programs of study within this career cluster based on the 2020-21 program of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for STEM can also be found on the [career cluster website](#).

Questions about courses and programs of study within this career cluster should be directed to Bryant.Nall@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Advanced STEM Applications	STEM I: Foundation (C21H15)	STEM II: Applications (C21H16) -or- AP Computer Science Principles (G02H44)	STEM III: STEM in Context (C21H17) -or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Advanced STEM Applications I (C03H01)	STEM IV: STEM Practicum (C21H18) -and/or- AP Calculus AB (G02H24) -or- AP Calculus BC (G02H25) -or- AP Computer Science A (G02H45) -or- AP Biology (G03H10) -or- AP Chemistry (G03H16)
	Industry Certification: Precision Measurement Instruments Certifications (Snap-On)	Industry Certification for C21H16: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor Certified User		
BioSTEM	BioSTEM I (C21H07)	BioSTEM II (C21H08)	BioSTEM III (C21H09)	BioSTEM Practicum (C21H10)
	Industry Certification: Precision Measurement Instruments Certifications (Snap-On)		Industry Certification: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor Certified User	

Engineering	Principles of Engineering and Technology (C21H04)	Engineering Design I (C21H05) -or- AP Computer Science Principles (G02H44) -or- Cambridge IGCSE Design and Technology (C21H03)	Engineering Design II (C21H06) -or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Engineering I (C21H00)	Engineering Practicum (C21H14) -and/or- AP Physics (G03H27, G03H28, G03H24, or G03H29) -or- AP Computer Science A (G02H45) -or- Dual Enrollment Engineering II (C21H11) -or- Cambridge International AS <u>Design and Technology</u> (C10H05)
	Industry Certification: Precision Measurement Instruments Certifications (Snap-On)	Industry Certification for C21H04: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor	Industry Certification for C21H06: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor	Industry Certification for C21H014: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor
Engineering by Design	Foundations of Technology (EBD) (C21H27)	Technological Design (EBD) (C21H28)	Advanced Design Applications (EBD) (C21H29) -and/or- Advanced Technological Applications (EBD) (C21H30)	Engineering Design (EBD) (C21H31)
Project Lead the Way	Introduction to Engineering (PLTW) (C21H19)	Principles of Engineering (PLTW) (C21H20)	Choice of the following: Aerospace Engineering (PLTW) (C21H21) -or- Civil Engineering & Architecture (PLTW) (C21H22) -or- Biotechnical Engineering (PLTW) (C21H23) -or- Digital Electronics (PLTW) (C21H24) -or- Computer Integrated Manufacturing (PLTW) (C21H25)	Engineering Design and Development (PLTW) (C21H26)

Technology	Principles of Engineering and Technology (C21H04)	Digital Electronics (C13H07) -or- AP Computer Science Principles (G02H44)	Robotics & Automated Systems (C13H15) -or- AP Computer Science Principles (G02H44) -or- Dual Enrollment Technology I (C21H01)	Engineering Practicum (C21H14) -and/or- AP Physics (G03H27, G03H28, G03H24, or G03H29) -or- AP Computer Science A (G02H45) -or- Dual Enrollment Technology II (C21H12)
	Industry Certification: Precision Measurement Instruments Certifications (Snap-On)	Industry Certification for C13H07: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor Certified User	Industry Certification for C13H15: FANUC	Industry Certification for C21H14: Certified Solidworks Associate (CSWA)- Academic -and/or- Autodesk Inventor Certified User

Note: Courses marked (EBD) are part of the *Engineering by Design* curriculum package and may require additional costs and training to implement. Courses marked (PLTW) are part of the *Project Lead the Way* curriculum package and may require additional costs and training to implement.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Introduction to Geographic Information Systems (C03H14)** is a supplemental course which can be offered in addition to courses within these programs of study but does not count toward concentrator status.

Transportation

The following are **proposed changes** to elective courses within this career cluster based on the 2020-21 programs of study justification process. With the Perkins V concentrator definition and business rule, the **Level 4 Dual Enrollment course code** for each program of study has been updated. Program of study justifications for Transportation can also be found on the [career cluster website](#).

Unmanned Aircraft Systems Pilot: This is a new course written to meet the need for certified commercial drone pilots. The course prepares students to successfully pilot small Unmanned Aircraft Systems, pass the FAA Remote Pilot Certification (Part 107), and transfer to postsecondary institutions.

Questions about courses and programs of study within this career cluster should be directed to John.Mummert@tn.gov.

Program of Study	Level 1	Level 2	Level 3	Level 4
Automotive Maintenance and Light Repair	Maintenance and Light Repair I (C20H09)	Maintenance and Light Repair II (C20H10)	Maintenance and Light Repair III (C20H11) -or- Dual Enrollment Automotive Maintenance & Light Repair I (C20H01)	Maintenance and Light Repair IV (C20H12) -or- Dual Enrollment Automotive Maintenance & Light Repair II (C20H21)
			Industry Certification: Precision Measurement Instruments Certification (includes all subtests)	Industry Certification: Automotive Service Excellence Student Certification: Maintenance & Light Repair

Automotive Collision Repair	Introduction to Collision Repair (C20H20)	Collision Repair: Non-Structural ¹ (C20H13) -or- Collision Repair: Painting & Refinishing ¹ (C20H14)	Collision Repair: Non-Structural ¹ (C20H13) -or- Collision Repair: Painting & Refinishing ¹ (C20H14) -or- Dual Enrollment Automotive & Collision Repair I (C20H02)	Collision Repair: Non-Structural ¹ (C20H13) -or- Collision Repair: Painting & Refinishing ¹ (C20H14) -or- Collision Repair: Damage Analysis, Estimating, & Customer Service (C20H19) -or- Dual Enrollment Automotive & Collision Repair II (C20H23)
			<p>Industry Certification for C20H13: I-CAR Refinish Technician ProLevel 1 or I-CAR Non-Structural Technician ProLevel 1 or Automotive Service Excellence Student Certification: Nonstructural Analysis/Repair</p> <p>Industry Certification for C20H14: Automotive Service Excellence Student Certification: Painting and Refinishing</p>	
Aviation Flight	Introduction to Aerospace (C20H15)	Aviation I: Principles of Flight (C20H16)	Aviation II: Advanced Flight (C20H18) -or- Dual Enrollment Aviation Flight I (C20H03)	Work-Based Learning: Career Practicum (C25H00) -or- Unmanned Aircraft Systems Pilot (C20HXX) -or- Dual Enrollment Aviation Flight II (C20H28)
				<p>Industry Certification for C20HXX Remote Pilot Certification (FAA Part 107)</p>

¹ May be taught for up to three credits. Implementation options vary; contact the career cluster consultant for more information.

Available courses for elective credit in this cluster:

- **Work-Based Learning: Career Practicum (C25H00)** may substitute for the Level 4 offering in all programs of study.
- **Welding I (C13H12)** and **Welding II (C13H10)** are supplemental courses which can be offered in addition to courses within the Automotive Collision Repair program of study but do not count toward concentrator status.
- **Structural** may be taken at a participating postsecondary institution as a third- or fourth-level course within the Automotive Collision Repair program of study.

- Programs of study in the areas of *Aviation Maintenance* and *Diesel Technology* can be found at a Tennessee College of Applied Technology. Please look at regional campus to determine course offerings. The following dual enrollment course codes apply: **Dual Enrollment Aviation Maintenance** (C20H04) and **Dual Enrollment Diesel Technology** (C20H06).

Middle School

Career Cluster	6 th Grade	7 th Grade	8 th Grade
Advanced Manufacturing	Exploring Technology (EBD) (C25X01) Design and Modeling (PLTW) (C25X02) STEM Explorers (C25600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Inventions and Innovations (EBD) (C25700) STEM Innovators (C25701)	Automation and Robotics (PLTW) (C25X03) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Magic of Electrons (PLTW) (C25805) Technological Systems (EBD) (C25800) Science and Technology (PLTW) (C25806) STEM Designers (C25801) Career Exploration* (C25X00)
Agriculture, Food, & Natural Resources		Introduction to Agricultural Sciences (C18X00)	Introduction to Agricultural Sciences (C18X00) Career Exploration* (C25X00)
Architecture & Construction	Design and Modeling (PLTW) (C25X02) Exploring Technology (EBD) (C25X01) STEM Explorers (C25600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Inventions and Innovations (EBD) (C25700) STEM Innovators (C25701)	Automation and Robotics (PLTW) (C25X03) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Magic of Electrons (PLTW) (C25805) Technological Systems (EBD) (C25800) Science and Technology (PLTW) (C25806) STEM Designers (C25801) Career Exploration* (C25X00)

Arts, Audio/Visual Technology, & Communication	Design and Modeling (PLTW) (C25X02) Keyboarding (G10600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Keyboarding (G10700)	Automation and Robotics (PLTW) (C25X03) Computer Applications (C12X00) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Keyboarding (G10800) Magic of Electrons (PLTW) (C25805) Science and Technology (PLTW) (C25806) Career Exploration* (C25X00)
Business Management & Administration	Keyboarding (G10600)	Keyboarding (G10700)	Computer Applications (C12X00) Keyboarding (G10800) Career Exploration* (C25X00)
Education & Training	Introduction to Social Health ² (C19X00)	Introduction to Social Health (C19X00)	Introduction to Social Health (C19X00) Career Exploration* (C25X00)
Finance	Keyboarding (G10600)	Keyboarding (G10700)	Computer Applications (C12X00) Keyboarding (G10800) Career Exploration* (C25X00)
Government & Public Administration			Career Exploration* (C25X00)
Health Science		Introduction to Health Science (C14X00)	Introduction to Health Science (C14X00) Medical Detectives (PLTW) (C14800) Career Exploration* (C25X00)
Hospitality & Tourism			Career Exploration* (C25X00)
Human Services	Introduction to Social Health ² (C19X00)	Introduction to Social Health (C19X00)	Introduction to Social Health (C19X00) Career Exploration* (C25X00)

Information Technology	Design and Modeling (PLTW) (C25X02) Keyboarding (G10600) STEM Explorers (C25600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Keyboarding (G10700) STEM Innovators (C25701)	Automation and Robotics (PLTW) (C25X03) Computer Applications (C12X00) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Keyboarding (G10800) Magic of Electrons (PLTW) (C25805) Science and Technology (PLTW) (C25806) STEM Designers (C25801) Career Exploration* (C25X00)
Law, Public Safety, Corrections, & Security			Career Exploration* (C25X00)
Marketing, Distribution & Logistics	Keyboarding (G10600)	Keyboarding (G10700)	Computer Applications (C12X00) Keyboarding (G10800) Career Exploration* (C25X00)
STEM	Design and Modeling (PLTW) (C25X02) Exploring Technology (EBD) (C25X01) STEM Explorers (C25600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Inventions and Innovations (EBD) (C25700) STEM Innovators (C25701)	Automation and Robotics (PLTW) (C25X03) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Magic of Electrons (PLTW) (C25805) Science and Technology (PLTW) (C25806) STEM Designers (C25801) Technological Systems (EBD) (C25800) Career Exploration* (C25X00)

Transportation	Design and Modeling (PLTW) (C25X02) Exploring Technology (EBD) (C25X01) STEM Explorers (C25600)	Automation and Robotics (PLTW) (C25X03) Design and Modeling (PLTW) (C25X02) Inventions and Innovations (EBD) (C25700) STEM Innovators (C25701)	Automation and Robotics (PLTW) (C25X03) Energy and the Environment (PLTW) (C25802) Flight and Space (PLTW) (C25803) Green Architecture (PLTW) (C25804) Magic of Electrons (PLTW) (C25805) Science and Technology (PLTW) (C25806) STEM Designers (C25801) Technological Systems (EBD) (C25800) Career Exploration* (C25X00)
----------------	----------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

¹ *Keyboarding* may also be used with 4th and 5th grade students (G10400, G10500). ² *Introduction to Social Health* may also be used with 5th grade students (C19X00).

Note: Courses marked (EBD) are part of the *Engineering by Design* curriculum package and may require additional costs and training to implement. Courses marked (PLTW) are part of the *Project Lead the Way* curriculum package and may require additional costs and training to implement.