2018–19 Programs of Study

Tennessee's career and technical education (CTE) programs of study are meant to provide a relevant framework of industry-aligned, rigorous courses that progress a student in knowledge and skills year after year. They provide invaluable opportunities for students to experience a subject that they are passionate about and explore interests that lead to postsecondary learning and future career paths. These sequenced courses also reflect and support the three-credit elective focus requirement for graduation. Level 1 courses are encouraged to be taken by students in ninth grade; however, districts may make scheduling decisions that work best for their communities and students.

Work-based learning (WBL) is seen as a valuable opportunity for all students. The **Work-Based Learning: Career Practicum (6105)** course may substitute for the Level 4 offering in all programs of study. Additionally, the **Work-Based Learning: Career Practicum (6105)** course can make a student a concentrator when taken as the third course in a program of study if the student's placement in is an **aligned occupation**. For more information, please refer to the department's Work-Based Learning Policy Guide at: https://www.tn.gov/content/dam/tn/education/ccte/wbl/wbl_policy_guide.pdf. Early postsecondary opportunities (EPSOs), such as dual enrollment, dual credit courses, and college level examination program exams (CLEP) are also valuable opportunities for all students and should be provided within the program of study.

The **dual enrollment course codes** may substitute for the Level 3 or 4 course offerings in any aligned career cluster's programs of study where those course codes represent postsecondary courses. Aligned **industry certifications** have been placed under the corresponding CTE course within the program of study to demonstrate where students have the opportunity to sit for industry and postsecondary recognized credential. .

Career Exploration (6166) is available to orient eighth and ninth grade students to high school, postsecondary, and career options and develop employability skills. This course can serve as a prerequisite for any CTE course and program of study; however, it is not a required part of any program of study and should not be counted toward CTE concentrator status.

For additional information about courses or programs of study, please reach out to the program managers, or visit our webpage at: https://www.tn.gov/education/career-and-technical-education.html.

Career Cluster	Manager	Email	Phone
Advanced Manufacturing	John Mummert	John.Mummert@tn.gov	(615) 532-2835
Agriculture, Food, & Natural Resources	Steve Gass	Steven.Gass@tn.gov	(615) 532-2847
Architecture & Construction	John Mummert	John.Mummert@tn.gov	(615) 532-2835
Arts, Audio/Visual Technology, & Communications	Deborah Knoll	Deborah.Knoll@tn.gov	(615) 532-2844
Business Management & Administration	Sarah Williams	Sarah.G.Williams@tn.gov	(615) 253-7442
Education & Training	Elizabeth Rafferty	Elizabeth.Rafferty@tn.gov	(615) 532-2840
Finance	Sarah Williams	Sarah.G.Williams@tn.gov	(615) 253-7442
Government & Public Administration	Sloan Hudson	Sloan.Hudson@tn.gov	(615) 532-2839
Health Science	Sloan Hudson	Sloan.Hudson@tn.gov	(615) 532-2839
Hospitality & Tourism	Elizabeth Rafferty	Elizabeth.Rafferty@tn.gov	(615) 532-2840
Human Services	Elizabeth Rafferty	Elizabeth.Rafferty@tn.gov	(615) 532-2840
Information Technology	Deborah Knoll	Deborah.Knoll@tn.gov	(615) 532-2844
Law, Public Safety, Corrections, & Security	Sloan Hudson	Sloan.Hudson@tn.gov	(615) 532-2839
Marketing, , Distribution, & Logistics	Sarah Williams	Sarah.G.Williams@tn.gov	(615) 253-7442
STEM	Deborah Knoll	Deborah.Knoll@tn.gov	(615) 532-2844
Transportation	John Mummert	John.Mummert@tn.gov	(615) 532-2835

Advanced Manufacturing

Program of Study	Level 1	Level 2	Level 3	Level 4
Machining Technology	Principles of Manufacturing (5922)	Principles of Machining I (5929)	Principles of Machining II (5923) -or- **Dual Enrollment** Machining Technology (4060)	Manufacturing Practicum (5926) -or- **Dual Enrollment** Machining Technology (4060)
	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:** Production Certification (CPT) Quality Practices and Measurement Module -and/or- OSHA 30 General Industry	**Industry Certification:** Production Certification (CPT) Manufacturing Processes and Production Module and Maintenance Awareness Module -and/or- OSHA 30 General Industry
Electromechanical Technology	Principles of Manufacturing (5922)	Introduction to Electromechanical (6091)	Advanced Electromechanical Technology (6090) -or- **Dual Enrollment** Electromechanical Technology (4061)	Manufacturing Practicum (5926) -or- **Dual Enrollment** Electromechanical Technology (4061)
	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:** OSHA 30 General Industry	**Industry Certification:** OSHA 30 General Industry

Program of Study	Level 1	Level 2	Level 3	Level 4
Mechatronics	Principles of Manufacturing (5922)	Digital Electronics (5925) -or- Robotics & Automated Systems (6143) -or- Project Lead the Way (PLTW) Computer Integrated Manufacturing (6055)	Mechatronics I[1] (6156) -or- **Dual Enrollment** Mechatronics (4063)	Mechatronics II[1] (6157) -or- Manufacturing Practicum (5926) -or- **Dual Enrollment** Mechatronics (4063)
	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:** FANUC only with Robotics & Automated Systems (6143)	**Industry Certification:** OSHA 30 General Industry	**Industry Certification:** Level 1 Siemens Certified Mechatronic Systems Assistant -and/or- OSHA 30 General Industry
Welding	Principles of Manufacturing (5922)	Welding I (6078)	Welding II[2] (6033) -or- **Dual Enrollment** Welding (4062)	Manufacturing Practicum (5926) -or- **Dual Enrollment** Welding (4062)
	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:** AWS SENSE Advanced Level Welder or American Welding Society Certified Welder -and/or- OSHA 30 General Industry	**Industry Certification:** 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*** (6105) course may substitute for the Level 4 offering in all programs of study.

Agriculture, Food, & Natural Resources

Program of Study	Level 1	Level 2	Level 3	Level 4
Veterinary and Animal Science	Agriscience[1] (5957)	Small Animal Science (5958)	Large Animal Science (6116) -or- **Dual Enrollment** Veterinary & Animal Science (4065)	Veterinary Science[1] (5961) -or- **Dual Enrollment** Veterinary & Animal Science (4065)
	Industry Certification: OSHA 10		**Industry Certification:** OSHA 30 General Industry	**Industry Certification**: TN Specific Industry Certification Animal Science (in pilot) -or- OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			
Agricultural Engineering and Applied Technologies	Agriscience[1] (5957)	Principles of Agricultural Mechanics (5944)	Agricultural Power and Equipment (5945) -or- **Dual Enrollment** Agricultural Engineering & Applied Technologies (4066)	Agricultural and Biosystems Engineering (5963) -or- **Dual Enrollment** Agricultural Engineering & Applied Technologies (4066)
	Industry Certification: OSHA 10	**Industry Certification:** Precision Measurement Instruments Certification (includes all subtests)	**Industry Certification:** OSHA 30 General Industry -or- Briggs & Stratton Basic Small Engine Certification	**Industry Certification:** Briggs & Stratton Master Service Technician -or- OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			

Program of Study	Level 1	Level 2	Level 3	Level 4
Agribusiness	Agriscience[1] (5957)	Principles of Agribusiness (5946)	Organizational Leadership and Communications (5956) -or- **Dual Enrollment** Agribusiness (4067)	Agricultural Business and Finance[2] (5943) -or- **Statewide Dual Credit** Intro to Agribusiness (4270) -or- **Dual Enrollment** Agribusiness (4067)
	Industry Certification: OSHA 10		**Industry Certification:** OSHA 30 General Industry	**Industry Certification:** OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			
Food Science	Agriscience[1] (5957)	Principles of Food Production (6118)	Food Science and Safety (6115) -or- **Dual Enrollment** Food Science (4068)	Advanced Food Science (6113) -or- **Dual Enrollment** Food Science (4068)
	Industry Certification: OSHA 10		**Industry Certification:** OSHA 30 General Industry	**Industry Certification:** OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			
Horticulture Science	Agriscience[1] (5957)	Principles of Plant Science and Hydroculture (6119)	Greenhouse Management (5954) -or- **Statewide Dual Credit Course** Introduction to Plant Science (4269) -or- **Dual Enrollment** Horticulture Science (4069)	Landscaping and Turf Science (5951) -or- **Dual Enrollment** Horticulture Science (4069)

	Industry Certification: OSHA 10		**Industry Certification:** OSHA 30 General Industry	**Industry Certification**: TN Specific Industry Certification Horticulture (in pilot) -and/or- Commercial Pesticide Certification- Core (03) -or- OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			
Environmental and Natural Resource Management	Agriscience[1] (5957)	Applied Environmental Science[1] (6114) -or- **Cambridge IGCSE** Environmental Management (4254)	Plant and Soil Science (5950) -or- **Dual Enrollment** Environmental & Natural Resources Management (4070)	Natural Resources Management (6117) -and/or- AP Environmental Science (3236) -or- **Dual Enrollment** Environmental & Natural Resources Management (4070) -or- **Cambridge Course** Environmental Management (AS Level Only) (4255)
	Industry Certification: OSHA 10		**Industry Certification:** OSHA 30 General Industry	**Industry Certification:** OSHA 30 General Industry
	Supervised Agricultural Experience (5964)			

[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* (6105) course may substitute for the Level 4 offering in all programs of study.
- *Introduction to Geographic Information Systems* (6142) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Architectural & Engineering Design	Architectural & Engineering Design I (6037)	Architectural & Engineering Design II (6039)	Architectural & Engineering Design III[1] (5927) -or- **Dual Enrollment** Architectural & Engineering Design (4075)	Engineering Practicum (6141) -and/or- AP Calculus (3127 or 3128) -and/or- AP Physics (3238, 3239, 3234, or 3240) -or- **Dual Enrollment** Architectural & Engineering Design (4075)
			Industry Certification: Certified Solidworks Associate -and/or- AutoCAD User	
Interior Design	Foundations of Interior Design (6014)	Residential Interior Design (6006)	Commercial Interior Design (6122) -or- **Dual Enrollment** Interior Design (4076)	Advanced Interior Design (6121) -or- **Dual Enrollment** Interior Design (4076)
Residential & Commercial Construction	Fundamentals of Construction (6073)	Residential & Commercial Construction I (6162)	Residential & Commercial Construction II[1] (6163) -or- **Dual Enrollment** Residential & Commercial Construction (4072)	Construction Practicum (6160) -or- **Dual Enrollment** Residential & Commercial Construction (4072)
	Industry Certification: NCCER Core Curriculum –and/or– OSHA 10	**Industry Certification:** NCCER Construction Technology	**Industry Certification**: OSHA 30 Construction	
Structural Systems	Fundamentals of Construction (6073)	Structural Systems I (6164)	Structural Systems II[1] (6165) -or- **Dual Enrollment** Structural Systems (4073)	Construction Practicum (6160) -or- **Dual Enrollment** Structural Systems (4073)
	Industry Certification:	**Industry Certification:**	**Industry Certification**: NCCER Carpentry Level	

	NCCER Core Curriculum –and/or- OSHA 10	NCCER Carpentry Level One -and/or- Precision Measurement Instruments Certification (includes all subtests)	Two –and/or- OSHA 30 Construction	
Mechanical, Electrical, & Plumbing (MEP) Systems	Fundamentals of Construction (6073)	MEP Systems (6161)	HVAC (6077) -and/or- Electrical Systems (6075) -and/or- Plumbing Systems (6082) -or- **Dual Enrollment** Mechanical, Electrical, & Plumbing Systems (4074)	Construction Practicum (6160) -or- **Dual Enrollment** Mechanical, Electrical, & Plumbing Systems (4074)
	Industry Certification: NCCER Core Curriculum –and/or- OSHA 10	**Industry Certification**: Precision Measurement Instruments Certification (includes all subtests)	**Industry Certifications for 6077**: 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 6075:** NCCER Electrical Level One –and/or- OSHA 30 Construction **Industry Certification for 6082**: NCCER Plumbing Level One	

[1] May be taught for one or two credits.

Available courses for elective credit in this cluster:
- *Work-Based Learning: Career Practicum* (6105) may substitute for the Level 4 offering in all programs of study.
- *Introduction to Geographic Information Systems* (6142) 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* (6078) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Digital Arts & Design	Digital Arts & Design I (6084)	Digital Arts & Design II (6086)	Digital Arts & Design III (6087) -or- **Dual Enrollment** Arts & Design (4078)	Applied Arts Practicum (6158) -and/or- AP Studio Art: 2-D Design (3545) -or- **Dual Enrollment** Arts & Design (4078)
			Industry Certification: Adobe Certified Associate	
Audio/Visual Production	A/V Production I (6049)	A/V Production II (6050)	A/V Production III (6083) -or- **Dual Enrollment** Audio/Visual Production (4079)	Applied Arts Practicum (6158) -and/or- AP English Language and Composition (3013) -or- **Dual Enrollment** Audio/Visual Production (4079)
Fashion Design	Visual Art I (3501)	Foundations of Fashion Design (6120)	Fashion Design (6008) -or- **Dual Enrollment** Fashion Design (4080) -or- **Cambridge International AS Level** Art & Design (4244)	Advanced Fashion Design (6009) -or- **Dual Enrollment** Fashion Design (4080)

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Journalism*** (3008) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Business Management	Introduction to Business & Marketing (5905)	Business Communications (5888) -or- Accounting I (5910) -or- **Cambridge IGCSE** Accounting (4238)	Business Management (5889) -or- **Statewide Dual Credit** Introduction to Business (6437) -or- **Dual Enrollment** Business Management (4082) -and/or- **Principles of Management CLEP** -or- **Cambridge AS** Business (4260)	Business & Entrepreneurship Practicum (6159) -and/or- Virtual Enterprise International[1] (5900) -or- **Dual Enrollment** Business Management (4082) -and/or- **Principles of Management CLEP**
			Industry Certification: Google Suite	
Office Management	Computer Applications (5891)	Business Communications (5888)	Business Management (5889) -or- **Statewide Dual Credit** Introduction to Business (6437) -or- **Dual Enrollment** Business Management (4082) -and/or- **Principles of Management CLEP** -or- **Cambridge AS** Business (4260)	Advanced Computer Applications (5904) -or- **Dual Enrollment** Office Management (4083) -and/or- **Information Systems CLEP**
			Industry Certification: Google Suite	**Industry Certification**: Microsoft Office Specialist: (Excel) (PowerPoint) (Word) -and/or- Microsoft Office Expert -and/or- Microsoft Officer Master

Program of Study	Level 1	Level 2	Level 3	Level 4
Health Services Administration	Introduction to Business & Marketing (5905) -or- Health Science Education (5998)	Health Information Technology (5997)	Business Management (5889) -or- **Statewide Dual Credit** Introduction to Business (6437) -or- **Dual Enrollment** Health Services Administration (4084) -or- **Cambridge AS** Business (4260)	Health Services Administration Practicum (6188) -or- **Dual Enrollment** Health Services Administration (4084)
			Industry Certification: Google Suite	
Human Resources Management	Introduction to Business & Marketing (5905)	Business Communications (5888)	Human Resources Management (6186) -or- **Dual Enrollment** Human Resources Management (6190)	Human Resources Management Practicum (6187) -or- **Dual Enrollment** Human Resources Management (6190)
			Industry Certification: Google Suite	

[1] Satisfies ½ credit of Economics required for graduation.

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***American Business Legal Systems*** (5892) and ***Business Economics*** (5898) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Teaching as a Profession (K-12)	Fundamentals of Education (6123)	Teaching as a Profession I (6010)	Teaching as a Profession II (6125) -or- **Dual Enrollment** Teaching as a Profession (K-12) (4086)	Teaching as a Profession III (6126) -or- **Dual Enrollment** Teaching as a Profession (K-12) (4086)
Early Childhood Education Careers	Early Childhood Education Careers I (6015)	Early Childhood Education Careers II (6016)	Early Childhood Education Careers III (6017) -or- **Dual Enrollment** Early Childhood Education Careers (4087)	Early Childhood Education Careers IV (6135) -or- **Dual Enrollment** Early Childhood Education Careers (4087)
				Industry Certification: Child Development Associate (CDA)
Educational Therapy and Support	Educational Therapy and Support I (6180)	Educational Therapy and Support II (6181)	Educational Therapy and Support III (6182) -or- **Dual Enrollment** Educational Therapy and Support (6192)	Educational Therapy and Support Practicum (6183) -or- **Dual Enrollment** Educational Therapy and Support (6192)

Available courses for elective credit in this cluster:
- *Work-Based Learning: Career Practicum* (6105) may substitute for the Level 4 offering in all programs of study.
- *Lifespan Development* (6013) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Accounting	Introduction to Business & Marketing (5905)	Accounting I (5910) -or- **Cambridge IGCSE** Accounting (4238)	Accounting II (5911) -or- **Dual Enrollment** Accounting (4090) -or- **Cambridge AS/A** Accounting (4239)	Financial Planning (5890) -or- Statistics (3136) -or- AP Statistics (3129) -and/or- **Dual Enrollment** Accounting (4090) -and/or- **Financial Accounting CLEP**
			Industry Certification: Quick Books Certified User	
Banking and Finance	Introduction to Business & Marketing (5905)	Accounting I (5910) -or- **Cambridge IGCSE** Accounting (4238)	Banking and Finance (5899) -or- **Dual Enrollment** Banking & Finance (4091)	Financial Planning (5890) -or- **Dual Enrollment** Banking & Finance (4091)

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Personal Finance*** (5901) is a course required for graduation but does not count toward concentrator status in a program of study.

Government & Public Administration

Program of Study	Level 1	Level 2	Level 3	Level 4
Public Management and Administration	Principles of Public Service (6127)	Public Management and Administration (6129)	Public Law and Budgeting (6128) -or- **Dual Enrollment** Public Management & Administration (4093)	AP US Government & Politics (3445) -or- Success Skills Through Service Learning (6104) -or- **Dual Enrollment** Public Management & Administration (4093)

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.

Health Science

Program of Study	Level 1	Level 2	Level 3	Level 4
Public Health	Health Science Education (5998)	Behavioral and Community Health (6130)	Global Health and Epidemiology (6132) -or- **Dual Enrollment** Public Health (4096)	Public Health Practicum (6184) -or- **Dual Enrollment** Public Health (4096)
			Industry Certification: OSHA 10 General Industry	
Diagnostic Services	Health Science Education (5998)	Anatomy and Physiology[1] (3251 or 5991) -or- Diagnostic Medicine (5994)	Diagnostic Medicine (5994) -or- Anatomy and Physiology[1] (3251 or 5991) -or- **Dual Enrollment** Diagnostic Services (4097)	Cardiovascular Services (6131) -and/or- Clinical Internship (5993) -or- **Dual Enrollment** Diagnostic Services (4097)
			Industry Certification: OSHA 10 General Industry	**Industry Certification following 6131 AND 5993:** Certified EKG Technician
Nursing Services	Health Science Education (5998)	Anatomy and Physiology[1] (3251 or 5991) -or- Medical Therapeutics (5999)	Medical Therapeutics (5999) -or- Anatomy and Physiology[1] (3251 and 5991) -or- **Dual Enrollment** Nursing Services (4099)	Nursing Education (6000) -and/or- Clinical Internship (5993) -or- **Dual Enrollment** Nursing Services (4099)
			Industry Certification: OSHA 10 General Industry	**Industry Certification:** Certified Nursing Assistant (CNA) -and/or- **Industry Certification following 6000 AND 5993:** Certified Patient Care Technician (CPCT)
Emergency Services	Health Science Education (5998)	Anatomy and Physiology[1] (3251 or 5991) -or- Medical Therapeutics	Medical Therapeutics (5999) -or- Anatomy and Physiology[1]	Emergency Medical Services[1] (5995) -or-

		(5999)	(3251 or 5991) -or- **Dual Enrollment** Emergency Services (4100)	Emergency Medical Services Practicum (6185) -or- **Dual Enrollment** Emergency Services (4100)
			Industry Certification: OSHA 10 General Industry	**Industry Certification**: Emergency Medical Responder
Therapeutic Services	Health Science Education (5998)	Anatomy and Physiology[1] (3251 or 5991) -or- One option from Level 3	Anatomy and Physiology[1] (3251 or 5991) 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 (6134) -or- Pharmacological Science (6133) -or- Nutrition Science and Diet Therapy[1] (6007) -or- Medical Therapeutics (5999) -or- **Dual Enrollment** Therapeutic Services (4101)	Clinical Internship (5993) -or- **Dual Enrollment** Therapeutic Services (4101)
			Industry Certification following 6133 AND 5993: Certified Pharmacy Technician **Industry Certification following 6134 AND 5993:** National Entry Level Dental Assistant (NELDA)	**Industry Certification following 5999 AND 5993:** Certified Clinical Medical Assistant **Industry Certification:** OSHA 10 General Industry
Sport and Human Performance	Health Science Education (5998)	Anatomy and Physiology[1] (3251 or 5991) -or- Rehabilitation Careers (5990)	Rehabilitation Careers (5990) -or- Anatomy and Physiology[1] (3251 or 5991) **Dual Enrollment** Exercise Physiology (4102)	Exercise Science (6170) -or- Clinical Internship (5993) -or- **Dual Enrollment** Exercise Physiology (4102)

			Industry Certification: OSHA 10 General Industry	Industry Certification following 6170 AND 5993: Certified Personal Trainer

[1] Satisfies one lab science credit for graduation.

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Medical Terminology*** (5883) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Culinary Arts	Culinary Arts I (5979)	Culinary Arts II (5980)	Culinary Arts III (5981) -or- **Dual Enrollment** Culinary Arts (4104)	Culinary Arts IV (6167) -or- **Dual Enrollment** Culinary Arts (4104)
			Industry Certification: ServSafe Food Manager -and/or- Certified Fundamentals Cook (CFC)	
Hospitality and Tourism Management	Hospitality & Tourism Exploration (5933) -or- **Cambridge IGCSE** Travel & Tourism (4262)	Hospitality Marketing (6169) -or- **Cambridge International AS Level** Travel & Tourism (4263)	Hospitality Management (5940) -or- **Dual Enrollment** Hospitality & Tourism Management (4105)	Event Planning & Management (6168) -or- **Dual Enrollment** Hospitality & Tourism Management (4105)
			Industry Certification: Certified Hospitality & Tourism Management Professional (CHTMP)	

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.

Human Services

Program of Study	Level 1	Level 2	Level 3	Level 4
Human and Social Sciences	Introduction to Human Studies (6137)	Lifespan Development (6013)	Family Studies (6136) -or- **Dual Enrollment** Human and Social Sciences (4108) -or- **Cambridge IGCSE** Sociology (4201) -or- **Human Growth and Development CLEP**	Human Services Practicum (6138) -and/or- Psychology (3433) -and/or- Sociology (3432) -or- **Dual Enrollment** Human and Social Sciences (4108)
			Industry Certification: Tennessee Specific Industry Certification for Human and Social Sciences (in pilot)	
Dietetics and Nutrition	Introduction to Human Studies (6137)	Nutrition Across the Lifespan (6005) -or- **Cambridge IGCSE** Food & Nutrition (4258)	Nutrition Science and Diet Therapy (6007) -or- **Dual Enrollment** Dietetics & Nutrition (4109)	Human Services Practicum (6138) -and/or- Psychology (3433) -and/or- Sociology (3432) -or- **Dual Enrollment** Dietetics & Nutrition (4109)
			Industry Certification: Tennessee Specific Industry Certification for Dietetics & Nutrition (in pilot)	

Program of Study	Level 1	Level 2	Level 3	Level 4
Cosmetology	Cosmetology I (5983)	Cosmetology II (5986)	Cosmetology III (5984) -or- **Dual Enrollment** Cosmetology (4110)	Cosmetology IV (6179) -or- **Dual Enrollment** Cosmetology (4110)
				Industry Certification: TN Cosmetology & Barber Examiners— TN Cosmetologist 1010
Barbering	Barbering I (5972)	Barbering II (5973)	Barbering III (5974) -or **Dual Enrollment** Barbering (4111)	Entrepreneurship[1] (5934) -or- **Dual Enrollment** Barbering (4111)
			Industry Certification: TN Cosmetology & Barber Examiners— TN Master Barber 1010	

[1] Satisfies ½ credit of Economics required for graduation.

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.

Information Technology

Program of Study	Level 1	Level 2	Level 3	Level 4
Coding	Computer Science Foundations (6095) -or- **Cambridge IGCSE** Computer Science (4265)	Coding I (6098) -or- AP Computer Science Principles (3634)	Coding II (6099) -or- Mobile App Development (6178) -or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Coding (4113)	Coding Practicum (5908) -and/or- AP Computer Science A (3635) -and/or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Coding (4113) -or- **Cambridge International AS Level** Computer Science (9825)
	Industry Certification: CompTIA IT Fundamentals		**Industry Certification:** Microsoft Technology Associate Software Development Fundamentals -and/or- CIW Web Foundation -and/or- JavaScript Specialist -and/or- Advanced HTML5/CSS3	
Networking Systems	Computer Science Foundations (6095)	Computer Systems (6094)	Networking (6097) -or **Dual Enrollment** Networking Systems (4114)	Cabling and Internetworking (6093) -and/or- IT Clinical Internship (6096) -or- **Dual Enrollment** Networking Systems (4114)
	Industry Certification: CompTIA IT Fundamentals	**Industry Certification**: Comp TIA A+ -and/or- Cisco Certified Entry Network Tech (CCENT)	**Industry Certification**: CompTIA Network + -and/or- Microsoft Technology Associate Infrastructure -and/or- Cisco IT Essentials PC Hardware & Software Certification -and/or- Cisco Certified Network Associate (CCNA)	

Program of Study	Level 1	Level 2	Level 3	Level 4
Web Design	Computer Science Foundations (6095) -or- **Cambridge IGCSE** Information and Communication Technology (9826)	Web Design Foundations (6100) -and/or- AP Computer Science Principles (3634)	Web Site Development (6101) -and/or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Web Design (4115)	Web Design Practicum (6171) -and/or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Web Design (4115)
	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	
Cybersecurity	Computer Science Foundations (6095)	Cybersecurity I (6175) -and/or- AP Computer Science Principles (3634)	Cybersecurity II (6176) -and/or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Cybersecurity (6191)	Cybersecurity Practicum (6177) -and/or- AP Computer Science Principles (3634) **Dual Enrollment** Cybersecurity (6191)
	Industry Certification: CompTIA IT Fundamentals	**Industry Certification**: CompTIA A+	**Industry Certification**: CompTIA Network +	**Industry Certification**: CompTIA Security + -and/or- Associate of ISC2

Available courses for elective credit in this cluster:
- ***Work-Based Learning: Career Practicum*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Introduction to Geographic Information Systems*** (6142) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Criminal Justice and Correction Services	Criminal Justice I (5987)	Criminal Justice II (5988)	Criminal Justice III: Forensic Criminal Investigations (5989) -or- **Statewide Dual Credit**: Criminal Justice (6431)[1] -or- **Dual Enrollment** Criminal Justice and Correction Services (4117)	Criminal Justice Practicum (6194) -or- **Dual Enrollment** Criminal Justice and Correction Services (4117)
Fire Management Services	Principles of Fire and Emergency Services (6154)	Fire Prevention (6173)	Fire Science I (6152) -or- **Dual Enrollment** Fire Management Services (4118)	Fire Science II (6153) -or- **Dual Enrollment** Fire Management Services (4118)
Pre-Law	Pre-Law I (6195)	Pre-Law II (6196)	Pre-Law III (6197) -or- **Dual Enrollment** Pre-Law (4119)	Success Skills in Service Learning (6104) -or- AP U.S. Government and Politics (3445) -or- **Dual Enrollment** Pre-Law (4119)

[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*** (6105) may substitute for the Level 4 offering in all programs of study.

Marketing, Distribution, & Logistics

Program of Study	Level 1	Level 2	Level 3	Level 4
Marketing Management	Introduction to Business & Marketing (5905)	Marketing and Management I: Principles[1] (5931)	Marketing and Management II: Advanced Strategies (5932) -or- **Dual Enrollment** Marketing Management (4121) -and/or- **Principles of Marketing CLEP**	Advertising and Public Relations (5936) -or- Retail Operations[1] (5938) -or- Event Planning & Management (6168) -or- **Dual Enrollment** Marketing Management (4121) -and/or- **Principles of Marketing CLEP**
			Industry Certifications: Hootsuite Platform Certification -and/or- Hootsuite Social Marketing Certification	
Entrepreneurship	Introduction to Business & Marketing (5905)	Marketing and Management I: Principles[1] (5931)	Entrepreneurship[1] (5934) -or- **Dual Enrollment** Entrepreneurship (4122) -or- **Cambridge IGCSE** Enterprise (9824)	Business & Entrepreneurship Practicum (6159) -or- Virtual Enterprise International[1] (5900) -or- **Dual Enrollment** Entrepreneurship (4122)
Supply Chain Management	Introduction to Business & Marketing (5905) -or- Marketing and Management I: Principles1 (5931)	Foundations of Supply Chain Management (6198)	Supply Chain Management I (6199) -or- Dual Enrollment Supply Chain Management (4132)	Supply Chain Management II (6200) -or- Supply Chain Management Practicum (6201) Dual Enrollment Supply Chain Management (4132)

		Industry Certification: Microsoft Office Specialist (Excel)	Industry Certification: 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*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Business Communications*** (5888) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Engineering	Principles of Engineering and Technology (5924)	Engineering Design I (6139) -or- AP Computer Science Principles (3634) -or- **Cambridge IGCSE** Design and Technology (4251)	Engineering Design II (6140) -or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Engineering (4124)	Engineering Practicum (6141) -and/or- AP Physics (3238, 3239, 3234, or 3240) -or- **Dual Enrollment** Engineering (4124) -or- **Cambridge International AS** Design and Technology (4252)
	Industry Certification: Precision Measurement Instruments Certification (includes all subtests)	**Industry Certification:** Certified Solidworks Associate (CSWA)-Academic –and/or– Autodesk Inventor Certified User		
Technology	Principles of Engineering and Technology (5924)	Digital Electronics (5925) -or- AP Computer Science Principles (3634)	Robotics & Automated Systems (6143) -or- AP Computer Science Principles (3634) -or- **Dual Enrollment** Technology (4125)	Engineering Practicum (6141) -and/or- AP Physics (3238, 3239, 3234, or 3240) -or- AP Computer Science A (3635) -or- **Dual Enrollment** Technology (4125)
	Industry Certification: Precision Measurement Instruments Certification (includes all subtests)	**Industry Certification:** Certified Solidworks Associate (CSWA)-Academic –and/or– Autodesk Inventor Certified User	**Industry Certification:** FANUC	**Industry Certification:** Certified Solidworks Associate (CSWA)-Academic –and/or– Autodesk Inventor Certified Use

Program of Study	Level 1	Level 2	Level 3	Level 4
Advanced STEM Applications	STEM I: Foundation (6144)	STEM II: Applications (6145) -or- AP Computer Science Principles (3634)	STEM III: STEM in Context (6146) -or- AP Computer Science Principles (3634) -or- **Dual Enrollment** STEM (4126)	STEM IV: STEM Practicum (6147) -and/or- AP Calculus AB (3127) -or- AP Calculus BC (3128) -or- AP Computer Science A (3635) -or- AP Biology (3217) -or- AP Chemistry (3225) -or- AP Physics (3238, 3239, 3234, or 3240) -or- **Dual Enrollment** STEM (4126)
	Industry Certification: Precision Measurement Instruments Certification (includes all subtests)	**Industry Certification**: Certified Solidworks Associate (CSWA)-Academic –and/or– Autodesk Inventor Certified User		
Project Lead the Way	Introduction to Engineering (PLTW) (6054)	Principles of Engineering (PLTW) (6052)	Choice of the following: Aerospace Engineering (PLTW) (6057) -or- Civil Engineering & Architecture (PLTW) (6056) -or- Biotechnical Engineering (PLTW) (6058) -or- Digital Electronics (PLTW) (6053) -or- Computer Integrated Manufacturing (PLTW) (6055)	Engineering Design and Development (PLTW) (6059)

Program of Study	Level 1	Level 2	Level 3	Level 4
Engineering by Design	Foundations of Technology (EBD) (5917)	Technological Design (EBD) (5885)	Advanced Design Applications (EBD) (5920) -and/or- Advanced Technological Applications (EBD) (5919)	Engineering Design (EBD) (5921)

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*** (6105) may substitute for the Level 4 offering in all programs of study.
- ***Introduction to Geographic Information Systems*** (6142) 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

Program of Study	Level 1	Level 2	Level 3	Level 4
Automotive Maintenance and Light Repair	Maintenance and Light Repair I (5879)	Maintenance and Light Repair II (5880)	Maintenance and Light Repair III (5881) -or- **Dual Enrollment** Automotive Maintenance & Light Repair (4128)	Maintenance and Light Repair IV (5882) -or- **Dual Enrollment** Automotive Maintenance & Light Repair (4128)
			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 (6172)	Collision Repair: Non-Structural[1] (6062) -or- Collision Repair: Painting & Refinishing[1] (6063)	Collision Repair: Non-Structural[1] (6062) -or- Collision Repair: Painting & Refinishing[1] (6063) -or- **Dual Enrollment** Automotive & Collision Repair (4129)	Collision Repair: Non-Structural[1] (6062) -or- Collision Repair: Painting & Refinishing[1] (6063) -or- Collision Repair: Damage Analysis, Estimating, & Customer Service (6149) -or- **Dual Enrollment** Automotive & Collision Repair (4129)
			Industry Certification for 6062: I-CAR Refinish Technician ProLevel 1 or I-CAR Non-Structural Technician ProLevel 1 or Automotive Service Excellence Student Certification: Nonstructural Analysis/Repair **Industry Certification for 6063:** Automotive Service Excellence Student Certification: Painting and Refinishing	

Program of Study	Level 1	Level 2	Level 3	Level 4
Aviation Flight	Introduction to Aerospace (6068)	Aviation I: Principles of Flight (6070)	Aviation II: Advanced Flight (6148) -or- **Dual Enrollment** Aviation Flight (4130)	Work-Based Learning: Career Practicum (6105) -or- **Dual Enrollment** Aviation Flight (4130)

[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* (6105) may substitute for the Level 4 offering in all programs of study.
- *Welding I (6078)* and *Welding II (6033)* 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 (6064)* 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* (4131) and *Dual Enrollment Diesel Technology* (4133).

Middle School

Career Cluster(s)	Grade 6	Grade 7	Grade 8
• Agriculture, Food, & Natural Resources		Introduction to Agricultural Sciences (0885)	Introduction to Agricultural Sciences (0885) Career Exploration* (6166)
• Arts, A/V Technology, & Communications • Business Management & Administration • Finance • Information Technology • Marketing	Keyboarding[1] (0610)	Keyboarding (0710)	Keyboarding (0810) Computer Applications (5891 or 3638) Career Exploration* (6166)
• Education & Training • Human Services	Introduction to Social Health[2] (0562)	Introduction to Social Health (0562)	Introduction to Social Health (0562) Career Exploration* (6166)
• Advanced Manufacturing • Architecture & Construction • STEM • Transportation, Distribution, & Logistics	Exploring Technology (EBD) (0647)	Inventions and Innovations (EBD) (0782)	Technological Systems (EBD) (0882) Career Exploration* (6166)
• Advanced Manufacturing • Architecture & Construction • Information Technology • STEM • Transportation, Distribution, & Logistics	STEM Explorers (0649)	STEM Innovators (0749)	STEM Designers (0849) Career Exploration* (6166)
• Health Science		Introduction to Health Science (0837)	Introduction to Health Science (0837) Medical Detectives (PLTW) (0890) Career Exploration* (6166)
• Advanced Manufacturing • Architecture & Construction • Arts, A/V Technology, & Communications • Information Technology • STEM • Transportation, Distribution, & Logistics	Design and Modeling (PLTW) (0783)	Automation and Robotics (PLTW) (0883)	Energy and the Environment (PLTW) (0886) Flight and Space (PLTW) (0887) Green Architecture (PLTW) (0888) Magic of Electrons (PLTW) (0889) Science and Technology (PLTW) (0891) Career Exploration (6166)

[1] *Keyboarding* may also be used with 4th and 5th grade students (0410, 0510). [2] *Introduction to Social Health* may also be used with 5th grade students (0562).

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.